

# *Planck* 2018 Results: Cosmological Parameter Tables

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## Abstract

These tables summarize the results of *Planck* 2018 parameter estimation exploration results. They are based on *Planck* HFI data and *Planck* lensing, as well as additional non-CMB data as detailed in the main parameter papers.

## 1 Introduction

The tables are arranged in groups, firstly by cosmological model, and then by data combination. The name tags match those of the full chains also provided on the PLA. The names all start with **base** to denote the baseline model, followed by the parameter tags of any additional parameters that are also varied (as defined in the parameter paper). Data combination tags are as follows (see the parameters paper for full description and references):

| Data tag                | Data used   |
|-------------------------|---|
| <b>plikHM</b>           | Baseline high- $\ell$ <i>Planck</i> power spectra ( <b>plik</b> cross-half-mission, $30 \leq \ell \leq 2508$ ).   |
| <b>CamSpecHM</b>        | <b>CamSpec</b> high- $\ell$ <i>Planck</i> power spectra.  |
| <b>CleanedCamSpecHM</b> | Foreground-cleaned <b>CamSpec</b> high- $\ell$ <i>Planck</i> power spectra.   |
| <b>lowl</b>             | Low- $\ell$ <i>Planck</i> temperature ( <b>Commander</b> , $2 \leq \ell \leq 29$ ).   |
| <b>lowE</b>             | Low- $\ell$ HFI <i>EE</i> polarization only ( <b>SimAll</b> , $2 \leq \ell \leq 29$ ).  |
| <b>lensing</b>          | <i>Planck</i> lensing power spectrum reconstruction. When used without other CMB likelihoods, it is marginalized over the theory CMB spectra given.   |
| <b>BAO</b>              | Baryon oscillation data from BOSS DR12, MGS, and 6DF.   |
| <b>Pantheon18</b>       | Supernova data from the Pantheon sample, with updated main distance file with heliocentric redshifts.   |
| <b>JLA</b>              | Supernova data from the SDSS-II/SNLS3 Joint Light-curve Analysis.   |
| <b>Riess18</b>          | Hubble parameter measurement from SHOES (Riess et al. 2018a, $H_0 = 73.45 \pm 1.66$ ).  |
| <b>BK15</b>             | Bicep-Keck (+Planck/WMAP) 2015 analysis (arXiv:1810.05216).   |
| <b>zre6p5</b>           | A hard prior, $z_{\text{re}} > 6.5$ .   |
| <b>reion</b>            | A hard prior, $z_{\text{re}} > 6.5$ , combined with a Gaussian prior, $z_{\text{re}} = 7 \pm 1$ .   |
| <b>lenspriors</b>       | Standard base parameters with $n_s = 0.96 \pm 0.02$ , $\Omega_b h^2 = 0.0222 \pm 0.0005$ , $100 > H_0 > 40$ , $\tau = 0.055$ .  |
| <b>DESpriors</b>        | DES cosmological parameter priors (flat on $0.1 < \Omega_m < 0.9$ , $0.03 < \Omega_b < 0.07$ , $55 < H_0 < 91$ , $0.5 < 10^9 A_s < 5$ , $Y_P = 0.245341$ and, if varied, $0.05\text{eV} < \sum m_\nu < 1\text{eV}$ ). |
| <b>CookeDH</b>          | A Gaussian prior $\Omega_b h^2 = 0.0222 \pm 0.0005$ (conservative, motivated by Cooke et al. 2017).   |
| <b>Cooke17</b>          | A Gaussian prior on D/H (Cooke et al. 2017), mean and error adjusted to approximately agree with <b>CookeDH</b> for $N_{\text{eff}} = 3.046$ .  |
| <b>Aver15</b>           | A Gaussian constraint on $Y_P^{\text{BBN}} = 0.2449 \pm 0.0040$ (Aver et al. 2015).   |
| <b>theta</b>            | A Gaussian prior $100\theta_{\text{MC}} = 1.0409 \pm 0.0006$ (acoustic scale from <i>Planck</i> CMB without LCDM assumption).   |
| <b>WMAP</b>             | The full WMAP (temperature and polarization) 9-year data.   |
| <b>DES</b>              | DES 1yr, cosmic shear+galaxy auto+cross.  |
| <b>DESlens</b>          | DES 1yr, cosmic shear only.   |
| <b>DESw</b>             | DES 1yr, galaxy auto+cross only.  |

The high- $\ell$  *Planck* likelihoods have TT, TE, EE variants from each spectrum alone, plus the TTTEEE joint constraint. Note that unless **nnu** is specified in the file name, the neutrino mass sum is fixed to  $\sum_\nu m_\nu = 0.06\text{eV}$  (including for DES chains). Non-linear corrections are modelled with HMCode in all cases (including when using DESpriors).

Data likelihoods are either included when running the chains, or by importance sampling. Data combinations that are added by importance sampling appear at the end of the list, following the **post\_** tag. Note that the best fits are merely examples of parameter combinations that fit the data well; due to parameter degeneracies there may be other combinations of parameters that fit the data nearly equally well.

Beneath each table is the  $\chi_{\text{eff}}^2 = -2\log(\text{likelihood})$  for each best-fit model, and also the contributions coming from each separate part of the likelihood. Mean minus log likelihoods are also given, as  $\bar{\chi}_{\text{eff}}^2$ . The tables also give the  $\chi_{\text{eff}}^2$  of the various component parts of the likelihood, where quoted values are the best-fit and mean, standard



deviation (in the case of  $1\sigma$  tables), or effective degrees of freedom ( $\nu$ , defined by  $\sigma^2/2$ ). Normalization of likelihoods is arbitrary, i.e., a constant can be added to log likelihoods without affecting any results. Only some likelihoods normalize so that the number is immediately interpretable as similar to a  $\chi^2$  for some number of data points.

The  $R - 1$  value is also given, which measures the convergence of the sampling chains, with small values being better converged. The sampling uncertainty on quoted mean values are typically of order  $R - 1$  in units of the standard deviation.

Parameter constraints were calculated from Monte Carlo chains from **CosmoMC** using **GetDist** ([getdist.readthedocs.org](http://getdist.readthedocs.org)).

Parameters and derived parameters, along with the name tags used in the chain files, are briefly described in the tables below.

Additional nuisance parameters for each likelihood are described in more detail in the respective papers.

| Parameter                              | Tag         | baseline  | Definition   |
|--|-------------|-----------|--|
| $\Omega_b h^2$                         | omegab2     | ...       | Baryon density today   |
| $\Omega_c h^2$                         | omegac2     | ...       | Cold dark matter density today   |
| $100\theta_{\text{MC}}$                | theta       | ...       | $100\times$ approximation to $r_s/D_M$ ( <b>CosmoMC</b> )                                |
| $\tau$                                 | tau         | ...       | Thomson scattering optical depth due to reionization                                     |
| $\Omega_K$                             | omegak      | 0         | $\Omega_{\text{tot}} = 1 - \Omega_K$   |
| $\Sigma m_\nu$                         | mnu         | 0.06      | Sum of active neutrino masses in eV  |
| $m_{\nu, \text{sterile}}^{\text{eff}}$ | meffsterile | 0         | Effective mass in sterile neutrinos in eV  |
| $w_0$                                  | w           | -1        | Dark energy equation of state, $w(a) = w_0 + (1 - a)w_a$                                 |
| $w_a$                                  | wa          | 0         | As above (perturbations modelled using PPF)  |
| $N_{\text{eff}}$                       | nnu         | 3.046     | Total effective number of massive and massless neutrinos (see text)                      |
| $Y_{\text{P}}$                         | yhe         | BBN       | Fraction of baryonic mass in helium (only if varied independently of BBN)                |
| $\alpha_{-1}$                          | alpha1      | 0         | Fully correlated isocurvature amplitude parameter  |
| $A_{\text{L}}$                         | Alens       | 1         | Amplitude of the lensing power relative to the physical value                            |
| $A_{\text{L}}^{\phi\phi}$              | Aphiphi     | 1         | Amplitude of the lensing reconstruction power relative to the physical value             |
| $A_{\text{L}}^{\text{fid}}$            | Alensf      | ...       | Amplitude of the lensing power relative to a fixed fiducial spectrum                     |
| $n_s$                                  | ns          | ...       | Scalar spectrum power-law index ( $k_0 = 0.05\text{Mpc}^{-1}$ )                          |
| $n_t$                                  | nt          | Inflation | Tensor spectrum power-law index ( $k_0 = 0.05\text{Mpc}^{-1}$ )                          |
| $d \ln n_s / d \ln k$                  | nrun        | 0         | Running of the spectral index  |
| $\log[10^{10} A_s]$                    | logA        | ...       | Log power of the primordial curvature perturbations ( $k_0 = 0.05\text{Mpc}^{-1}$ )      |
| $r_{0.05}$                             | r           | 0         | Tensor power spectrum amplitude ( $k_0 = 0.05\text{Mpc}^{-1}$ )                          |
| $H_0$                                  | H0          | ...       | Current expansion rate in $\text{km s}^{-1}\text{Mpc}^{-1}$                              |
| $\Omega_{\text{m}}$                    | omegam      | ...       | Matter density (incl. massive neutrinos) today divided by the critical density           |
| $\Omega_{\Lambda}$                     | omegal      | ...       | Dark energy density divided by the critical density today                                |
| $\Omega_{\text{m}} h^2$                | omegamh2    | ...       | Total matter density today (incl. massive neutrinos)                                     |
| $\Omega_{\text{m}} h^3$                | omegamh3    | ...       | $h \times$ total matter density today  |
| $\sigma_8$                             | sigma8      | ...       | RMS matter fluctuations today in linear theory   |
| $S_8$                                  | S8          | ...       | $\sigma_8(\Omega_{\text{m}}/0.3)^{0.5}$  |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$     | s8omegamp5  | ...       | $\sigma_8 \Omega_{\text{m}}^{0.5}$ constrained by low-redshift lensing                   |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$    | s8omegamp25 | ...       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ constrained by CMB lensing                           |
| $\sigma_8 / h^{0.5}$                   | s8h5        | ...       | $\sigma_8 / h^{0.5}$   |
| $\sigma_8 / h^{0.5}$                   | rdragh      | ...       | $r_{\text{drag}} h$ in Mpc   |
| $\langle d^2 \rangle^{1/2}$            | rmsdeflect  | ...       | RMS CMB lensing deflection angle in arcmin (approx. using $2 \leq L \leq 2000$ )         |
| $z_{\text{re}}$                        | zrei        | ...       | Redshift at which Universe is half reionized   |
| $10^9 A_s$                             | A           | ...       | Power of the primordial curvature perturbations ( $k_0 = 0.05\text{Mpc}^{-1}$ )          |
| $10^9 A_s e^{-2\tau}$                  | clamp       | ...       | Parameter determining the small-scale CMB power  |
| $Y_{\text{P}}$                         | yheused     | bbn       | Fraction of baryonic mass in helium  |
| $Y_{\text{P}}^{\text{BBN}}$            | YpBBN       | bbn       | Nucleon fraction in helium   |
| $10^5 \text{D/H}$                      | DHBBN       | bbn       | $10^5$ deuterium-helium ratio from <b>Parthenope</b> BBN prediction (pre-Marcucci rates) |
| Age/Gyr                                | age         | ...       | Time since the start of the hot big bang   |



| Parameter                                | Tag            | baseline | Definitions  |
|--|----------------|----------|--|
| $z_*$                                    | zstar          | ...      | Redshift for which the optical depth equals unity  |
| $r_* = r_s(z_*)$                         | rstar          | ...      | Comoving size of the sound horizon at $z = z_*$  |
| $100\theta_*$                            | thetastar      | ...      | 100× Angular size of the sound horizon at last scattering  |
| $D_M/\text{Gpc}(z_*)$                    | DAstar         | ...      | Comoving angular diameter distance to last scattering  |
| $z_{\text{drag}}$                        | zdrag          | ...      | Redshift at which baryon-drag optical depth equals unity   |
| $r_{\text{drag}} = r_s(z_{\text{drag}})$ | rdrag          | ...      | Comoving size of the sound horizon at $z = z_{\text{drag}}$  |
| $k_D$                                    | kd             | ...      | Characteristic damping comoving wavenumber ( $\text{Mpc}^{-1}$ )                                     |
| $100\theta_D$                            | thetad         | ...      | 100× angular extent of photon diffusion at last scattering   |
| $z_{\text{eq}}$                          | zeq            | ...      | Redshift of matter-radiation equality (massless neutrinos)   |
| $k_{\text{eq}}$                          | keq            | ...      | $[a(z_{\text{eq}})H(z_{\text{eq}})]^{-1}$  |
| $100\theta_{\text{eq}}$                  | thetaeq        | ...      | 100× angular size of the comoving Horizon at matter-radiation equality                               |
| $100\theta_{s,\text{eq}}$                | thetarseq      | ...      | 100× angular size of the comoving sound Horizon at matter-radiation equality                         |
| $D_{40}$                                 | D40            | ...      | $\ell(\ell+1)C_\ell^{TT}/2\pi$ at $\ell = 40$ in $\mu\text{K}^2$                                     |
| $D_{220}$                                | D200           | ...      | $\ell(\ell+1)C_\ell^{TT}/2\pi$ at $\ell = 220$ in $\mu\text{K}^2$                                    |
| $D_{810}$                                | D810           | ...      | $\ell(\ell+1)C_\ell^{TT}/2\pi$ at $\ell = 810$ in $\mu\text{K}^2$                                    |
| $D_{1420}$                               | D1420          | ...      | $\ell(\ell+1)C_\ell^{TT}/2\pi$ at $\ell = 1420$ in $\mu\text{K}^2$                                   |
| $D_{2000}$                               | D2000          | ...      | $\ell(\ell+1)C_\ell^{TT}/2\pi$ at $\ell = 2000$ in $\mu\text{K}^2$                                   |
| $n_{s,0.002}$                            | ns02           | ...      | Scalar spectral index at $k = 0.002\text{Mpc}^{-1}$  |
| $r_{0.002}$                              | r02            | 0        | Tensor/scalar ratio at $k = 0.002\text{Mpc}^{-1}$  |
| $r_{0.01}$                               | rBB            | 0        | Tensor/scalar ratio at $k = 0.01\text{Mpc}^{-1}$ (roughly BB peak)                                   |
| $r_{10}$                                 | r10            | 0        | Tensor-scalar temperature $C_\ell$ amplitude at $\ell = 10$  |
| $A_t$                                    | AT             | 0        | $10^9 A_t$ ( $k_0 = 0.05\text{Mpc}^{-1}$ )   |
| $10^9 A_t e^{-2\tau}$                    | ctlamp         | 0        | Parameter determining $\ell \simeq 100$ tensor $C_\ell$ amplitude                                    |
| $H(z)$                                   | Hubble{100z}   | ...      | Hubble parameter at redshift $z$ ( $\text{km s}^{-1}\text{Mpc}^{-1}$ )                               |
| $D_M(z)$                                 | DM{100z}       | ...      | Comoving angular diameter distance to redshift $z$ in Mpc  |
| $f\sigma_8(z)$                           | fsigma8z{100z} | ...      | Growth parameter $f\sigma_8$ at redshift $z$   |
| $\sigma_8(z)$                            | sigma8z{100z}  | ...      | $\sigma_8$ at redshift $z$   |
| $f_{2000}^{143}$                         | f2000_143      | ...      | Total temperature foreground power at $\ell = 2000$ in 143GHz $C_\ell$                               |
| $f_{2000}^{143 \times 217}$              | f2000_x        | ...      | Total temperature foreground power at $\ell = 2000$ in $217\text{GHz} \times 143\text{GHz}$ $C_\ell$ |
| $f_{2000}^{217}$                         | f2000_217      | ...      | Total temperature foreground power at $\ell = 2000$ in 217GHz $C_\ell$                               |
| $\chi_x^2$                               | chi2_x         | ...      | $-2\log(\text{likelihood})$ for likelihood $x$ ; (most are normalized like a $\chi^2$ ).             |



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## 2 Baseline model

### 2.1 base\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022132 | $0.02214^{+0.00044}_{-0.00043}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4585   | $0.458^{+0.026}_{-0.025}$       | $100\theta_{s,eq}$          | 0.4486   | $0.4487^{+0.0090}_{-0.0089}$ |
| $\Omega_c h^2$              | 0.12049  | $0.1205^{+0.0042}_{-0.0041}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6098   | $0.610^{+0.023}_{-0.023}$       | $H(0.15)$                   | 72.32    | $72.3^{+1.6}_{-1.5}$         |
| $100\theta_{MC}$            | 1.04085  | $1.04084^{+0.00094}_{-0.00095}$ | $\sigma_8/h^{0.5}$          | 0.9911   | $0.991^{+0.031}_{-0.032}$       | $D_M(0.15)$                 | 646.9    | $647^{+16}_{-15}$            |
| $\tau$                      | 0.0519   | $0.052^{+0.016}_{-0.015}$       | $r_{drag}h$                 | 98.58    | $98.6^{+3.2}_{-3.1}$            | $H(0.38)$                   | 82.57    | $82.6^{+1.1}_{-1.1}$         |
| $\ln(10^{10} A_s)$          | 3.0384   | $3.039^{+0.031}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$ | 2.447    | $2.448^{+0.075}_{-0.074}$       | $D_M(0.38)$                 | 1540.8   | $1541^{+31}_{-31}$           |
| $n_s$                       | 0.9639   | $0.964^{+0.011}_{-0.012}$       | $z_{re}$                    | 7.50     | $7.5^{+1.6}_{-1.7}$             | $H(0.51)$                   | 89.36    | $89.38^{+0.89}_{-0.85}$      |
| $y_{cal}$                   | 1.0004   | $1.0005^{+0.0050}_{-0.0050}$    | $10^9 A_s$                  | 2.087    | $2.089^{+0.066}_{-0.066}$       | $D_M(0.51)$                 | 1994.7   | $1994^{+36}_{-36}$           |
| $A_{100}^{PS}$              | 238.8    | $242^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8813   | $1.882^{+0.027}_{-0.027}$       | $H(0.61)$                   | 95.04    | $95.05^{+0.71}_{-0.68}$      |
| $A_{143}^{PS}$              | 41.3     | $41^{+20}_{-20}$                | $D_{40}$                    | 1228.7   | $1230^{+31}_{-29}$              | $D_M(0.61)$                 | 2320.0   | $2320^{+39}_{-39}$           |
| $A_{217}^{PS}$              | 100.6    | $101^{+30}_{-30}$               | $D_{220}$                   | 5702     | $5704^{+83}_{-84}$              | $H(2.33)$                   | 236.64   | $236.6^{+2.5}_{-2.5}$        |
| $A_{217}^{CIB}$             | 45.0     | $41^{+20}_{-10}$                | $D_{810}$                   | 2534.0   | $2534^{+27}_{-28}$              | $D_M(2.33)$                 | 5775.9   | $5775^{+32}_{-32}$           |
| $A_{143}^{tSZ}$             | 5.89     | $< 7.38$                        | $D_{1420}$                  | 814.3    | $814^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4624   | $0.462^{+0.024}_{-0.024}$    |
| $r_{143 \times 217}^{PS}$   | 0.582    | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | 229.56   | $229.6^{+3.5}_{-3.6}$           | $\sigma_8(0.15)$            | 0.7486   | $0.749^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | $n_{s,0.002}$               | 0.9639   | $0.964^{+0.011}_{-0.012}$       | $f\sigma_8(0.38)$           | 0.4789   | $0.479^{+0.019}_{-0.019}$    |
| $\xi^{tSZ \times CIB}$      | 0.12     | —                               | $Y_P$                       | 0.245298 | $0.24529^{+0.00018}_{-0.00021}$ | $\sigma_8(0.38)$            | 0.6627   | $0.663^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | 1.2      | —                               | $Y_P^{BBN}$                 | 0.246624 | $0.24662^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.51)$           | 0.4766   | $0.476^{+0.016}_{-0.016}$    |
| $A_{100}^{dust}$            | 1.011    | $1.01^{+0.38}_{-0.39}$          | $10^5 D/H$                  | 2.631    | $2.630^{+0.084}_{-0.081}$       | $\sigma_8(0.51)$            | 0.6199   | $0.620^{+0.011}_{-0.011}$    |
| $A_{143}^{dust}$            | 0.991    | $0.98^{+0.34}_{-0.35}$          | Age/Gyr                     | 13.826   | $13.825^{+0.072}_{-0.072}$      | $f\sigma_8(0.61)$           | 0.4710   | $0.471^{+0.014}_{-0.014}$    |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1090.27  | $1090.26^{+0.81}_{-0.80}$       | $\sigma_8(0.61)$            | 0.5896   | $0.5896^{+0.0099}_{-0.010}$  |
| $A_{143 \times 217}^{dust}$ | 0.995    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.49   | $144.49^{+0.94}_{-0.93}$        | $f\sigma_8(2.33)$           | 0.29696  | $0.2970^{+0.0049}_{-0.0049}$ |
| $c_{100}$                   | 0.99755  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04105  | $1.04105^{+0.00093}_{-0.00093}$ | $\sigma_8(2.33)$            | 0.3058   | $0.3058^{+0.0052}_{-0.0052}$ |
| $c_{217}$                   | 1.00139  | $1.0012^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.879   | $13.879^{+0.086}_{-0.086}$      | $f_{2000}^{143}$            | 31.1     | $31^{+6}_{-6}$               |
| $H_0$                       | 66.96    | $67.0^{+1.8}_{-1.8}$            | $z_{drag}$                  | 1059.44  | $1059.43^{+0.89}_{-0.90}$       | $f_{2000}^{217}$            | 107.60   | $107.6^{+4.0}_{-4.0}$        |
| $\Omega_\Lambda$            | 0.6805   | $0.680^{+0.025}_{-0.026}$       | $r_{drag}$                  | 147.22   | $147.23^{+0.94}_{-0.93}$        | $f_{2000}^{143 \times 217}$ | 32.96    | $33^{+4}_{-4}$               |
| $\Omega_m$                  | 0.3195   | $0.320^{+0.026}_{-0.025}$       | $k_D$                       | 0.14054  | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{small}^2$            | 395.83   | $396.9 (\nu: 1.3)$           |
| $\Omega_m h^2$              | 0.14327  | $0.1432^{+0.0039}_{-0.0039}$    | $100\theta_D$               | 0.16106  | $0.16106^{+0.00053}_{-0.00051}$ | $\chi_{lowl}^2$             | 23.40    | $23.5 (\nu: 0.8)$            |
| $\Omega_m h^3$              | 0.09594  | $0.09593^{+0.00089}_{-0.00088}$ | $z_{eq}$                    | 3408     | $3408^{+94}_{-92}$              | $\chi_{CamSpec}^2$          | 7050.3   | $7063.4 (\nu: 14.8)$         |
| $\sigma_8$                  | 0.8110   | $0.811^{+0.017}_{-0.018}$       | $k_{eq}$                    | 0.010403 | $0.01040^{+0.00029}_{-0.00028}$ | $\chi_{prior}^2$            | 2.2      | $7.7 (\nu: 6.3)$             |
| $S_8$                       | 0.8370   | $0.837^{+0.048}_{-0.046}$       | $100\theta_{eq}$            | 0.8115   | $0.812^{+0.018}_{-0.017}$       | $\chi_{CMB}^2$              | 7469.6   | $7483.8 (\nu: 15.1)$         |

Best-fit  $\chi_{eff}^2 = 7471.74$ ;  $\bar{\chi}_{eff}^2 = 7491.54$ ;  $R - 1 = 0.00710$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.83 commander\_dx12\_v3.2\_29: 23.40 CamSpec like\_10.7HM: 7050.34



## 2.2 base\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02223^{+0.00039}_{-0.00039}$ | $\sigma_8/h^{0.5}$          | $0.981^{+0.023}_{-0.023}$       | $D_M(0.38)$                 | $1529^{+18}_{-18}$           |
| $\Omega_c h^2$                       | $0.1189^{+0.0024}_{-0.0023}$    | $r_{\text{drag}} h$         | $99.8^{+1.8}_{-1.8}$            | $H(0.51)$                   | $89.69^{+0.58}_{-0.55}$      |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00084}_{-0.00083}$ | $\langle d^2 \rangle^{1/2}$ | $2.424^{+0.053}_{-0.054}$       | $D_M(0.51)$                 | $1981^{+21}_{-21}$           |
| $\tau$                               | $0.054^{+0.016}_{-0.016}$       | $z_{\text{re}}$             | $7.6^{+1.5}_{-1.7}$             | $H(0.61)$                   | $95.29^{+0.48}_{-0.47}$      |
| $\ln(10^{10} A_s)$                   | $3.039^{+0.033}_{-0.034}$       | $10^9 A_s$                  | $2.088^{+0.069}_{-0.071}$       | $D_M(0.61)$                 | $2305^{+23}_{-23}$           |
| $n_s$                                | $0.9674^{+0.0081}_{-0.0085}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0050}$    | $D_{40}$                    | $1222^{+26}_{-25}$              | $D_M(2.33)$                 | $5765^{+24}_{-24}$           |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{220}$                   | $5711^{+82}_{-82}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                   | $2534^{+27}_{-28}$              | $\sigma_8(0.15)$            | $0.746^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.472^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+20}_{-10}$                | $D_{2000}$                  | $229.9^{+3.4}_{-3.5}$           | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.44$                        | $n_{\text{s},0.002}$        | $0.9674^{+0.0081}_{-0.0085}$    | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.26}_{-0.26}$          | $Y_{\text{P}}$              | $0.24533^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.619^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.24666^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$    | $2.613^{+0.074}_{-0.071}$       | $\sigma_8(0.61)$            | $0.589^{+0.010}_{-0.010}$    |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$     | $13.803^{+0.053}_{-0.056}$      | $f\sigma_8(2.33)$           | $0.2970^{+0.0050}_{-0.0052}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $z_*$                       | $1090.01^{+0.59}_{-0.57}$       | $\sigma_8(2.33)$            | $0.3062^{+0.0052}_{-0.0054}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.35}$          | $r_*$                       | $144.82^{+0.62}_{-0.62}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.04125^{+0.00083}_{-0.00082}$ | $f_{2000}^{217}$            | $107.4^{+3.8}_{-3.9}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.33}$          | $D_M(z_*)/\text{Gpc}$       | $13.909^{+0.059}_{-0.060}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\text{drag}}$           | $1059.52^{+0.87}_{-0.89}$       | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | $147.54^{+0.67}_{-0.68}$        | $\chi_{\text{lowl}}^2$      | $22.81 (\nu: 0.4)$           |
| $H_0$                                | $67.7^{+1.1}_{-1.1}$            | $k_{\text{D}}$              | $0.14028^{+0.00088}_{-0.00086}$ | $\chi_{\text{CamSpec}}^2$   | $7063.9 (\nu: 14.3)$         |
| $\Omega_{\Lambda}$                   | $0.690^{+0.014}_{-0.014}$       | $100\theta_{\text{D}}$      | $0.16102^{+0.00052}_{-0.00050}$ | $\chi_{6\text{DF}}^2$       | $0.054 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.310^{+0.014}_{-0.014}$       | $z_{\text{eq}}$             | $3373^{+56}_{-55}$              | $\chi_{\text{MGS}}^2$       | $1.39 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | $0.1418^{+0.0024}_{-0.0023}$    | $k_{\text{eq}}$             | $0.01029^{+0.00017}_{-0.00017}$ | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 1.2)$             |
| $\Omega_{\text{m}} h^3$              | $0.09593^{+0.00090}_{-0.00087}$ | $100\theta_{\text{eq}}$     | $0.818^{+0.010}_{-0.010}$       | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 6.2)$             |
| $\sigma_8$                           | $0.807^{+0.015}_{-0.016}$       | $100\theta_{\text{s,eq}}$   | $0.4521^{+0.0053}_{-0.0053}$    | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.8)$             |
| $S_8$                                | $0.820^{+0.029}_{-0.029}$       | $H(0.15)$                   | $72.92^{+0.92}_{-0.91}$         | $\chi_{\text{CMB}}^2$       | $7483.8 (\nu: 14.5)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.449^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $640.9^{+9.1}_{-9.0}$           |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.602^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.00^{+0.70}_{-0.68}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7497.55; R - 1 = 0.01113$$



### 2.3 base\_CamSpecHM\_TT\_lowl\_lowE\_post\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02239^{+0.00044}_{-0.00042}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.021}_{-0.021}$       | $D_M(0.15)$                 | $634^{+13}_{-15}$            |
| $\Omega_c h^2$              | $0.1171^{+0.0036}_{-0.0037}$    | $\sigma_8/h^{0.5}$          | $0.968^{+0.029}_{-0.029}$       | $H(0.38)$                   | $83.6^{+1.1}_{-1.1}$         |
| $100\theta_{MC}$            | $1.04132^{+0.00089}_{-0.00088}$ | $r_{drag}h$                 | $101.3^{+2.8}_{-3.0}$           | $D_M(0.38)$                 | $1514^{+28}_{-28}$           |
| $\tau$                      | $0.056^{+0.018}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | $2.396^{+0.068}_{-0.061}$       | $H(0.51)$                   | $90.13^{+0.87}_{-0.84}$      |
| $\ln(10^{10} A_s)$          | $3.039^{+0.033}_{-0.032}$       | $z_{re}$                    | $7.8^{+1.7}_{-1.6}$             | $D_M(0.51)$                 | $1963^{+33}_{-33}$           |
| $n_s$                       | $0.9718^{+0.0097}_{-0.010}$     | $10^9 A_s$                  | $2.089^{+0.069}_{-0.067}$       | $H(0.61)$                   | $95.64^{+0.75}_{-0.65}$      |
| $y_{cal}$                   | $1.0008^{+0.0057}_{-0.0052}$    | $10^9 A_s e^{-2\tau}$       | $1.868^{+0.025}_{-0.027}$       | $D_M(0.61)$                 | $2286^{+36}_{-36}$           |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $D_{40}$                    | $1214^{+29}_{-28}$              | $H(2.33)$                   | $234.7^{+2.2}_{-2.1}$        |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5724^{+87}_{-89}$              | $D_M(2.33)$                 | $5750^{+30}_{-34}$           |
| $A_{217}^{PS}$              | $101^{+20}_{-30}$               | $D_{810}$                   | $2534^{+28}_{-28}$              | $f\sigma_8(0.15)$           | $0.443^{+0.021}_{-0.022}$    |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{1420}$                  | $816.9^{+9.6}_{-10}$            | $\sigma_8(0.15)$            | $0.742^{+0.015}_{-0.015}$    |
| $A_{143}^{tSZ}$             | $< 7.36$                        | $D_{2000}$                  | $230.6^{+3.3}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.464^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9718^{+0.0097}_{-0.010}$     | $\sigma_8(0.38)$            | $0.659^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24540^{+0.00017}_{-0.00017}$ | $f\sigma_8(0.51)$           | $0.465^{+0.015}_{-0.015}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24673^{+0.00017}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.617^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.583^{+0.079}_{-0.079}$       | $f\sigma_8(0.61)$           | $0.461^{+0.014}_{-0.014}$    |
| $A_{100}^{dust}$            | $1.02^{+0.38}_{-0.37}$          | $Age/Gyr$                   | $13.771^{+0.066}_{-0.070}$      | $\sigma_8(0.61)$            | $0.588^{+0.011}_{-0.010}$    |
| $A_{143}^{dust}$            | $0.97^{+0.34}_{-0.34}$          | $z_*$                       | $1089.65^{+0.72}_{-0.80}$       | $f\sigma_8(2.33)$           | $0.2969^{+0.0052}_{-0.0050}$ |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $145.17^{+0.87}_{-0.85}$        | $\sigma_8(2.33)$            | $0.3067^{+0.0054}_{-0.0052}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.33}_{-0.32}$          | $100\theta_*$               | $1.04151^{+0.00089}_{-0.00087}$ | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $D_M(z_*)/Gpc$              | $13.938^{+0.075}_{-0.079}$      | $f_{2000}^{217}$            | $106.9^{+3.9}_{-4.0}$        |
| $c_{217}$                   | $1.0012^{+0.0029}_{-0.0030}$    | $z_{drag}$                  | $1059.77^{+0.92}_{-0.91}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $68.5^{+1.7}_{-1.7}$            | $r_{drag}$                  | $147.84^{+0.88}_{-0.86}$        | $\chi_{simall}^2$           | $397.2 (\nu: 1.9)$           |
| $\Omega_\Lambda$            | $0.701^{+0.022}_{-0.021}$       | $k_D$                       | $0.14009^{+0.00098}_{-0.00097}$ | $\chi_{lowl}^2$             | $22.13 (\nu: 0.4)$           |
| $\Omega_m$                  | $0.299^{+0.021}_{-0.022}$       | $100\theta_D$               | $0.16089^{+0.00052}_{-0.00051}$ | $\chi_{CamSpec}^2$          | $7067.0 (\nu: 18.2)$         |
| $\Omega_m h^2$              | $0.1401^{+0.0034}_{-0.0033}$    | $z_{eq}$                    | $3334^{+82}_{-80}$              | $\chi_{H073p45}^2$          | $9.0 (\nu: 4.4)$             |
| $\Omega_m h^3$              | $0.09604^{+0.00096}_{-0.00087}$ | $k_{eq}$                    | $0.01017^{+0.00025}_{-0.00024}$ | $\chi_{prior}^2$            | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                  | $0.802^{+0.017}_{-0.017}$       | $100\theta_{eq}$            | $0.826^{+0.016}_{-0.017}$       | $\chi_{CMB}^2$              | $7486.3 (\nu: 17.5)$         |
| $S_8$                       | $0.800^{+0.041}_{-0.042}$       | $100\theta_{s,eq}$          | $0.4561^{+0.0080}_{-0.0085}$    |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.023}_{-0.023}$       | $H(0.15)$                   | $73.7^{+1.4}_{-1.4}$            |                             |                              |

$$\bar{\chi}_{eff}^2 = 7502.88; R - 1 = 0.07941$$



## 2.4 base\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02214^{+0.00043}_{-0.00043}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.459^{+0.026}_{-0.025}$       | $100\theta_{\text{s,eq}}$   | $0.4489^{+0.0090}_{-0.0089}$ |
| $\Omega_{\text{c}} h^2$              | $0.1204^{+0.0041}_{-0.0040}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.610^{+0.023}_{-0.023}$       | $H(0.15)$                   | $72.4^{+1.5}_{-1.5}$         |
| $100\theta_{\text{MC}}$              | $1.04086^{+0.00093}_{-0.00094}$ | $\sigma_8/h^{0.5}$                  | $0.992^{+0.031}_{-0.031}$       | $D_{\text{M}}(0.15)$        | $646^{+16}_{-15}$            |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $r_{\text{drag}} h$                 | $98.7^{+3.2}_{-3.1}$            | $H(0.38)$                   | $82.6^{+1.1}_{-1.1}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.042^{+0.027}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$         | $2.450^{+0.074}_{-0.072}$       | $D_{\text{M}}(0.38)$        | $1540^{+31}_{-31}$           |
| $n_{\text{s}}$                       | $0.964^{+0.011}_{-0.012}$       | $z_{\text{re}}$                     | $< 8.83$                        | $H(0.51)$                   | $89.40^{+0.89}_{-0.85}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0050}$    | $10^9 A_{\text{s}}$                 | $2.095^{+0.058}_{-0.054}$       | $D_{\text{M}}(0.51)$        | $1994^{+36}_{-36}$           |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.881^{+0.027}_{-0.026}$       | $H(0.61)$                   | $95.07^{+0.71}_{-0.68}$      |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{40}$                            | $1229^{+31}_{-29}$              | $D_{\text{M}}(0.61)$        | $2319^{+39}_{-39}$           |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{220}$                           | $5704^{+82}_{-84}$              | $H(2.33)$                   | $236.6^{+2.5}_{-2.5}$        |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{810}$                           | $2534^{+27}_{-27}$              | $D_{\text{M}}(2.33)$        | $5775^{+32}_{-32}$           |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $D_{1420}$                          | $814^{+10}_{-10}$               | $f\sigma_8(0.15)$           | $0.463^{+0.024}_{-0.024}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                          | $229.6^{+3.5}_{-3.6}$           | $\sigma_8(0.15)$            | $0.750^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$                | $0.964^{+0.011}_{-0.012}$       | $f\sigma_8(0.38)$           | $0.479^{+0.019}_{-0.019}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                      | $0.24530^{+0.00017}_{-0.00021}$ | $\sigma_8(0.38)$            | $0.664^{+0.011}_{-0.010}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24662^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.51)$           | $0.477^{+0.016}_{-0.016}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D}/\text{H}$            | $2.629^{+0.084}_{-0.081}$       | $\sigma_8(0.51)$            | $0.621^{+0.010}_{-0.0089}$   |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.35}$          | $\text{Age}/\text{Gyr}$             | $13.824^{+0.071}_{-0.072}$      | $f\sigma_8(0.61)$           | $0.471^{+0.014}_{-0.014}$    |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $z_*$                               | $1090.24^{+0.81}_{-0.79}$       | $\sigma_8(0.61)$            | $0.5905^{+0.0092}_{-0.0082}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                               | $144.51^{+0.94}_{-0.93}$        | $f\sigma_8(2.33)$           | $0.2974^{+0.0043}_{-0.0040}$ |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                       | $1.04106^{+0.00092}_{-0.00092}$ | $\sigma_8(2.33)$            | $0.3063^{+0.0045}_{-0.0042}$ |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.881^{+0.086}_{-0.086}$      | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $H_0$                                | $67.0^{+1.8}_{-1.8}$            | $z_{\text{drag}}$                   | $1059.44^{+0.88}_{-0.92}$       | $f_{2000}^{217}$            | $107.5^{+4.0}_{-4.0}$        |
| $\Omega_{\Lambda}$                   | $0.681^{+0.024}_{-0.026}$       | $r_{\text{drag}}$                   | $147.25^{+0.94}_{-0.92}$        | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $\Omega_{\text{m}}$                  | $0.319^{+0.026}_{-0.024}$       | $k_{\text{D}}$                      | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.3)$           |
| $\Omega_{\text{m}} h^2$              | $0.1432^{+0.0039}_{-0.0038}$    | $100\theta_{\text{D}}$              | $0.16106^{+0.00053}_{-0.00051}$ | $\chi_{\text{lowl}}^2$      | $23.5 (\nu: 0.8)$            |
| $\Omega_{\text{m}} h^3$              | $0.09594^{+0.00089}_{-0.00087}$ | $z_{\text{eq}}$                     | $3406^{+94}_{-92}$              | $\chi_{\text{CamSpec}}^2$   | $7063.2 (\nu: 14.7)$         |
| $\sigma_8$                           | $0.812^{+0.017}_{-0.016}$       | $k_{\text{eq}}$                     | $0.01040^{+0.00029}_{-0.00028}$ | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 6.3)$             |
| $S_8$                                | $0.837^{+0.048}_{-0.046}$       | $100\theta_{\text{eq}}$             | $0.812^{+0.018}_{-0.017}$       | $\chi_{\text{CMB}}^2$       | $7483.6 (\nu: 14.6)$         |

$$\bar{\chi}_{\text{eff}}^2 = 7491.26; R - 1 = 0.00680$$



## 2.5 base\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02223^{+0.00039}_{-0.00039}$ | $\sigma_8/h^{0.5}$          | $0.982^{+0.022}_{-0.021}$       | $D_M(0.38)$                 | $1529^{+18}_{-18}$           |
| $\Omega_c h^2$                       | $0.1189^{+0.0024}_{-0.0023}$    | $r_{\text{drag}} h$         | $99.8^{+1.8}_{-1.8}$            | $H(0.51)$                   | $89.70^{+0.58}_{-0.55}$      |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00084}_{-0.00083}$ | $\langle d^2 \rangle^{1/2}$ | $2.427^{+0.052}_{-0.050}$       | $D_M(0.51)$                 | $1981^{+21}_{-22}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $z_{\text{re}}$             | $< 8.95$                        | $H(0.61)$                   | $95.30^{+0.48}_{-0.47}$      |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.028}_{-0.027}$       | $10^9 A_s$                  | $2.093^{+0.060}_{-0.056}$       | $D_M(0.61)$                 | $2305^{+23}_{-23}$           |
| $n_s$                                | $0.9675^{+0.0082}_{-0.0084}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $D_{40}$                    | $1222^{+26}_{-24}$              | $D_M(2.33)$                 | $5765^{+23}_{-24}$           |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{220}$                   | $5711^{+81}_{-80}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                   | $2534^{+27}_{-28}$              | $\sigma_8(0.15)$            | $0.747^{+0.013}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                  | $815.3^{+9.9}_{-9.9}$           | $f\sigma_8(0.38)$           | $0.473^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{2000}$                  | $230.0^{+3.4}_{-3.4}$           | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0098}$   |
| $A_{143}^{\text{tSZ}}$               | $< 7.44$                        | $n_{s,0.002}$               | $0.9675^{+0.0082}_{-0.0084}$    | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.26}_{-0.26}$          | $Y_{\text{P}}$              | $0.24534^{+0.00016}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6196^{+0.0095}_{-0.0090}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.24666^{+0.00016}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.467^{+0.010}_{-0.0097}$   |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$    | $2.613^{+0.075}_{-0.071}$       | $\sigma_8(0.61)$            | $0.5896^{+0.0089}_{-0.0085}$ |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$     | $13.803^{+0.053}_{-0.056}$      | $f\sigma_8(2.33)$           | $0.2974^{+0.0045}_{-0.0042}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $z_*$                       | $1090.00^{+0.58}_{-0.57}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $r_*$                       | $144.83^{+0.62}_{-0.62}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.21}$          | $100\theta_*$               | $1.04125^{+0.00083}_{-0.00082}$ | $f_{2000}^{217}$            | $107.3^{+3.8}_{-3.9}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.33}$          | $D_M(z_*)/\text{Gpc}$       | $13.909^{+0.060}_{-0.060}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\text{drag}}$           | $1059.53^{+0.86}_{-0.89}$       | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.5)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | $147.54^{+0.68}_{-0.68}$        | $\chi_{\text{lowl}}^2$      | $22.83 (\nu: 0.4)$           |
| $H_0$                                | $67.7^{+1.1}_{-1.0}$            | $k_{\text{D}}$              | $0.14028^{+0.00088}_{-0.00086}$ | $\chi_{\text{CamSpec}}^2$   | $7063.8 (\nu: 14.1)$         |
| $\Omega_{\Lambda}$                   | $0.690^{+0.014}_{-0.014}$       | $100\theta_{\text{D}}$      | $0.16101^{+0.00052}_{-0.00049}$ | $\chi_{6\text{DF}}^2$       | $0.054 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.310^{+0.014}_{-0.014}$       | $z_{\text{eq}}$             | $3372^{+56}_{-55}$              | $\chi_{\text{MGS}}^2$       | $1.40 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | $0.1418^{+0.0024}_{-0.0023}$    | $k_{\text{eq}}$             | $0.01029^{+0.00017}_{-0.00017}$ | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.2)$             |
| $\Omega_{\text{m}} h^3$              | $0.09594^{+0.00091}_{-0.00087}$ | $100\theta_{\text{eq}}$     | $0.818^{+0.010}_{-0.010}$       | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 6.2)$             |
| $\sigma_8$                           | $0.808^{+0.014}_{-0.013}$       | $100\theta_{\text{s,eq}}$   | $0.4522^{+0.0054}_{-0.0053}$    | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.8)$             |
| $S_8$                                | $0.821^{+0.029}_{-0.028}$       | $H(0.15)$                   | $72.93^{+0.93}_{-0.90}$         | $\chi_{\text{CMB}}^2$       | $7483.5 (\nu: 14.1)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.449^{+0.016}_{-0.015}$       | $D_M(0.15)$                 | $640.8^{+9.0}_{-9.1}$           |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.603^{+0.015}_{-0.015}$       | $H(0.38)$                   | $83.00^{+0.70}_{-0.67}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7497.31; R - 1 = 0.01176$$



## 2.6 base\_CamSpecHM\_TT\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02240^{+0.00043}_{-0.00042}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.593^{+0.021}_{-0.021}$       | $D_M(0.15)$                 | $633^{+13}_{-15}$            |
| $\Omega_c h^2$              | $0.1171^{+0.0036}_{-0.0037}$    | $\sigma_8/h^{0.5}$          | $0.969^{+0.029}_{-0.029}$       | $H(0.38)$                   | $83.6^{+1.1}_{-1.1}$         |
| $100\theta_{MC}$            | $1.04133^{+0.00092}_{-0.00087}$ | $r_{drag}h$                 | $101.4^{+2.8}_{-3.0}$           | $D_M(0.38)$                 | $1514^{+27}_{-30}$           |
| $\tau$                      | $0.057^{+0.015}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$ | $2.398^{+0.067}_{-0.061}$       | $H(0.51)$                   | $90.14^{+0.91}_{-0.80}$      |
| $\ln(10^{10} A_s)$          | $3.041^{+0.031}_{-0.028}$       | $z_{re}$                    | $< 9.09$                        | $D_M(0.51)$                 | $1963^{+32}_{-35}$           |
| $n_s$                       | $0.972^{+0.010}_{-0.010}$       | $10^9 A_s$                  | $2.093^{+0.066}_{-0.058}$       | $H(0.61)$                   | $95.65^{+0.74}_{-0.65}$      |
| $y_{cal}$                   | $1.0008^{+0.0057}_{-0.0051}$    | $10^9 A_s e^{-2\tau}$       | $1.868^{+0.025}_{-0.027}$       | $D_M(0.61)$                 | $2286^{+34}_{-38}$           |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $D_{40}$                    | $1214^{+30}_{-27}$              | $H(2.33)$                   | $234.7^{+2.2}_{-2.1}$        |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5725^{+87}_{-89}$              | $D_M(2.33)$                 | $5750^{+30}_{-34}$           |
| $A_{217}^{PS}$              | $101^{+20}_{-30}$               | $D_{810}$                   | $2534^{+27}_{-28}$              | $f\sigma_8(0.15)$           | $0.444^{+0.021}_{-0.022}$    |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{1420}$                  | $816.9^{+9.2}_{-9.9}$           | $\sigma_8(0.15)$            | $0.743^{+0.014}_{-0.013}$    |
| $A_{143}^{tSZ}$             | $< 7.32$                        | $D_{2000}$                  | $230.7^{+3.2}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.465^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.972^{+0.010}_{-0.010}$       | $\sigma_8(0.38)$            | $0.660^{+0.012}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24540^{+0.00017}_{-0.00017}$ | $f\sigma_8(0.51)$           | $0.465^{+0.015}_{-0.015}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24673^{+0.00017}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.618^{+0.011}_{-0.0092}$   |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.582^{+0.079}_{-0.078}$       | $f\sigma_8(0.61)$           | $0.461^{+0.014}_{-0.013}$    |
| $A_{100}^{dust}$            | $1.02^{+0.38}_{-0.38}$          | Age/Gyr                     | $13.770^{+0.066}_{-0.075}$      | $\sigma_8(0.61)$            | $0.588^{+0.010}_{-0.0087}$   |
| $A_{143}^{dust}$            | $0.97^{+0.35}_{-0.35}$          | $z_*$                       | $1089.63^{+0.71}_{-0.79}$       | $f\sigma_8(2.33)$           | $0.2972^{+0.0049}_{-0.0041}$ |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $145.18^{+0.86}_{-0.85}$        | $\sigma_8(2.33)$            | $0.3070^{+0.0047}_{-0.0044}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.33}_{-0.32}$          | $100\theta_*$               | $1.04151^{+0.00088}_{-0.00086}$ | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.939^{+0.078}_{-0.079}$      | $f_{2000}^{217}$            | $106.9^{+3.9}_{-3.8}$        |
| $c_{217}$                   | $1.0012^{+0.0029}_{-0.0030}$    | $z_{drag}$                  | $1059.78^{+0.91}_{-0.92}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $68.6^{+1.7}_{-1.7}$            | $r_{drag}$                  | $147.85^{+0.92}_{-0.86}$        | $\chi_{simall}^2$           | $397.2 (\nu: 1.9)$           |
| $\Omega_\Lambda$            | $0.702^{+0.022}_{-0.021}$       | $k_D$                       | $0.14009^{+0.00098}_{-0.00097}$ | $\chi_{lowl}^2$             | $22.13 (\nu: 0.4)$           |
| $\Omega_m$                  | $0.298^{+0.021}_{-0.022}$       | $100\theta_D$               | $0.16089^{+0.00052}_{-0.00051}$ | $\chi_{CamSpec}^2$          | $7066.9 (\nu: 17.7)$         |
| $\Omega_m h^2$              | $0.1401^{+0.0034}_{-0.0033}$    | $z_{eq}$                    | $3333^{+81}_{-79}$              | $\chi_{H073p45}^2$          | $8.9 (\nu: 4.4)$             |
| $\Omega_m h^3$              | $0.09605^{+0.00096}_{-0.00086}$ | $k_{eq}$                    | $0.01017^{+0.00025}_{-0.00024}$ | $\chi_{prior}^2$            | $7.5 (\nu: 5.8)$             |
| $\sigma_8$                  | $0.802^{+0.017}_{-0.016}$       | $100\theta_{eq}$            | $0.826^{+0.016}_{-0.017}$       | $\chi_{CMB}^2$              | $7486.2 (\nu: 16.9)$         |
| $S_8$                       | $0.800^{+0.041}_{-0.042}$       | $100\theta_{s,eq}$          | $0.4562^{+0.0082}_{-0.0080}$    |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.023}_{-0.023}$       | $H(0.15)$                   | $73.7^{+1.5}_{-1.5}$            |                             |                              |

$\bar{\chi}_{eff}^2 = 7502.64$ ;  $R - 1 = 0.09766$



## 2.7 base\_CamSpecHM\_TTTEE\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022297 | $0.02229^{+0.00031}_{-0.00031}$ | $S_8$                       | 0.8261   | $0.827^{+0.032}_{-0.032}$       | $100\theta_{s,eq}$          | 0.4505   | $0.4503^{+0.0060}_{-0.0058}$ |
| $\Omega_c h^2$              | 0.11956  | $0.1196^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4525   | $0.453^{+0.017}_{-0.017}$       | $H(0.15)$                   | 72.73    | $72.7^{+1.1}_{-1.0}$         |
| $100\theta_{MC}$            | 1.04087  | $1.04088^{+0.00061}_{-0.00060}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6047   | $0.605^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | 642.8    | $643^{+10}_{-10}$            |
| $\tau$                      | 0.0531   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | 0.9843   | $0.985^{+0.023}_{-0.023}$       | $H(0.38)$                   | 82.87    | $82.86^{+0.77}_{-0.74}$      |
| $\ln(10^{10} A_s)$          | 3.0390   | $3.039^{+0.033}_{-0.033}$       | $r_{drag} h$                | 99.32    | $99.3^{+2.1}_{-2.1}$            | $D_M(0.38)$                 | 1532.6   | $1533^{+21}_{-21}$           |
| $n_s$                       | 0.9662   | $0.9658^{+0.0087}_{-0.0088}$    | $\langle d^2 \rangle^{1/2}$ | 2.433    | $2.434^{+0.055}_{-0.056}$       | $H(0.51)$                   | 89.61    | $89.60^{+0.61}_{-0.59}$      |
| $y_{cal}$                   | 1.00034  | $1.0005^{+0.0049}_{-0.0048}$    | $z_{re}$                    | 7.56     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.51)$                 | 1985.0   | $1985^{+24}_{-25}$           |
| $A_{100}^{PS}$              | 234.8    | $240^{+50}_{-50}$               | $10^9 A_s$                  | 2.088    | $2.088^{+0.069}_{-0.067}$       | $H(0.61)$                   | 95.243   | $95.24^{+0.49}_{-0.47}$      |
| $A_{143}^{PS}$              | 41.1     | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8780   | $1.879^{+0.023}_{-0.022}$       | $D_M(0.61)$                 | 2309.6   | $2310^{+26}_{-26}$           |
| $A_{217}^{PS}$              | 101.9    | $102^{+30}_{-30}$               | $D_{40}$                    | 1225.0   | $1226^{+25}_{-25}$              | $H(2.33)$                   | 236.19   | $236.2^{+1.6}_{-1.6}$        |
| $A_{217}^{CIB}$             | 44.3     | $40^{+10}_{-10}$                | $D_{220}$                   | 5716     | $5718^{+76}_{-75}$              | $D_M(2.33)$                 | 5766.4   | $5767^{+22}_{-22}$           |
| $A_{143}^{tSZ}$             | 6.43     | $< 7.48$                        | $D_{810}$                   | 2534.7   | $2535^{+26}_{-26}$              | $f\sigma_8(0.15)$           | 0.4569   | $0.457^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{PS}$   | 0.629    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | 815.8    | $815.6^{+9.4}_{-9.4}$           | $\sigma_8(0.15)$            | 0.7467   | $0.747^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | 0.76     | —                               | $D_{2000}$                  | 230.27   | $230.2^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | 0.4748   | $0.475^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | 0.20     | —                               | $n_{s,0.002}$               | 0.9662   | $0.9658^{+0.0087}_{-0.0088}$    | $\sigma_8(0.38)$            | 0.6616   | $0.662^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | 0.3      | —                               | $Y_P$                       | 0.245366 | $0.24536^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | 0.4731   | $0.473^{+0.012}_{-0.012}$    |
| $A_{100}^{dust}$            | 1.003    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246692 | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.6191   | $0.619^{+0.010}_{-0.010}$    |
| $A_{143}^{dust}$            | 0.980    | $0.96^{+0.35}_{-0.35}$          | $10^5 D/H$                  | 2.599    | $2.601^{+0.059}_{-0.057}$       | $f\sigma_8(0.61)$           | 0.4680   | $0.468^{+0.011}_{-0.011}$    |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | 13.8046  | $13.805^{+0.049}_{-0.049}$      | $\sigma_8(0.61)$            | 0.5890   | $0.5890^{+0.0099}_{-0.0098}$ |
| $A_{143 \times 217}^{dust}$ | 1.012    | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | 1089.98  | $1089.99^{+0.56}_{-0.55}$       | $f\sigma_8(2.33)$           | 0.2969   | $0.2969^{+0.0050}_{-0.0049}$ |
| $c_{100}$                   | 0.99760  | $0.9975^{+0.0021}_{-0.0020}$    | $r_*$                       | 144.60   | $144.58^{+0.62}_{-0.60}$        | $\sigma_8(2.33)$            | 0.3060   | $0.3060^{+0.0053}_{-0.0052}$ |
| $c_{217}$                   | 1.00127  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | 1.04106  | $1.04107^{+0.00060}_{-0.00059}$ | $f_{2000}^{143}$            | 30.0     | $30^{+6}_{-6}$               |
| $c_{TE}$                    | 0.9965   | $0.9968^{+0.0097}_{-0.0096}$    | $D_M(z_*)/\text{Gpc}$       | 13.890   | $13.888^{+0.058}_{-0.056}$      | $f_{2000}^{217}$            | 106.72   | $106.9^{+3.8}_{-3.8}$        |
| $c_{EE}$                    | 0.9920   | $0.9921^{+0.0097}_{-0.0094}$    | $z_{drag}$                  | 1059.74  | $1059.73^{+0.62}_{-0.64}$       | $f_{2000}^{143 \times 217}$ | 32.23    | $32^{+4}_{-4}$               |
| $H_0$                       | 67.43    | $67.4^{+1.2}_{-1.2}$            | $r_{drag}$                  | 147.29   | $147.27^{+0.62}_{-0.61}$        | $\chi_{small}^2$            | 395.90   | $396.9 (\nu: 1.4)$           |
| $\Omega_\Lambda$            | 0.6866   | $0.686^{+0.016}_{-0.017}$       | $k_D$                       | 0.14060  | $0.14061^{+0.00067}_{-0.00068}$ | $\chi_{lowl}^2$             | 23.00    | $23.16 (\nu: 0.4)$           |
| $\Omega_m$                  | 0.3134   | $0.314^{+0.017}_{-0.016}$       | $100\theta_D$               | 0.160865 | $0.16087^{+0.00037}_{-0.00037}$ | $\chi_{CamSpec}^2$          | 11499.6  | $11514.5 (\nu: 15.8)$        |
| $\Omega_m h^2$              | 0.14250  | $0.1426^{+0.0026}_{-0.0026}$    | $z_{eq}$                    | 3390     | $3392^{+61}_{-61}$              | $\chi_{prior}^2$            | 2.2      | $7.8 (\nu: 6.0)$             |
| $\Omega_m h^3$              | 0.09609  | $0.09610^{+0.00061}_{-0.00061}$ | $k_{eq}$                    | 0.010347 | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{CMB}^2$              | 11918.5  | $11934.6 (\nu: 16.4)$        |
| $\sigma_8$                  | 0.8082   | $0.808^{+0.015}_{-0.015}$       | $100\theta_{eq}$            | 0.8152   | $0.815^{+0.012}_{-0.011}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11920.76$ ;  $\bar{\chi}_{eff}^2 = 11942.46$ ;  $R - 1 = 0.01233$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.90 commander\_dx12\_v3.2\_29: 23.00 CamSpec like\_10.7HM\_1400\_unified: 11499.65



## 2.8 base\_CamSpecHM\_TTTEE\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00028}_{-0.00028}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $640.4^{+7.6}_{-7.7}$        |
| $\Omega_c h^2$                       | $0.1190^{+0.0020}_{-0.0020}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.05^{+0.58}_{-0.56}$      |
| $100\theta_{MC}$                     | $1.04097^{+0.00057}_{-0.00059}$ | $\sigma_8/h^{0.5}$          | $0.980^{+0.020}_{-0.020}$       | $D_M(0.38)$                 | $1528^{+15}_{-16}$           |
| $\tau$                               | $0.054^{+0.016}_{-0.016}$       | $r_{\text{drag}} h$         | $99.8^{+1.5}_{-1.5}$            | $H(0.51)$                   | $89.75^{+0.47}_{-0.46}$      |
| $\ln(10^{10} A_s)$                   | $3.039^{+0.033}_{-0.033}$       | $\langle d^2 \rangle^{1/2}$ | $2.425^{+0.049}_{-0.049}$       | $D_M(0.51)$                 | $1979^{+18}_{-18}$           |
| $n_s$                                | $0.9674^{+0.0076}_{-0.0076}$    | $z_{\text{re}}$             | $7.6^{+1.5}_{-1.7}$             | $H(0.61)$                   | $95.35^{+0.39}_{-0.38}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0048}$    | $10^9 A_s$                  | $2.089^{+0.069}_{-0.067}$       | $D_M(0.61)$                 | $2304^{+19}_{-20}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.021}_{-0.021}$       | $H(2.33)$                   | $235.8^{+1.2}_{-1.3}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1223^{+24}_{-24}$              | $D_M(2.33)$                 | $5762^{+19}_{-18}$           |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{220}$                   | $5722^{+76}_{-73}$              | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.746^{+0.013}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                  | $816.1^{+9.4}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.24}_{-0.25}$          | $D_{2000}$                  | $230.4^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9674^{+0.0076}_{-0.0076}$    | $f\sigma_8(0.51)$           | $0.471^{+0.010}_{-0.010}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.619^{+0.011}_{-0.010}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4662^{+0.0094}_{-0.0095}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.37}_{-0.38}$          | $10^5 D/H$                  | $2.592^{+0.054}_{-0.051}$       | $\sigma_8(0.61)$            | $0.589^{+0.010}_{-0.0097}$   |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | $13.795^{+0.042}_{-0.041}$      | $f\sigma_8(2.33)$           | $0.2969^{+0.0051}_{-0.0049}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.87^{+0.46}_{-0.45}$       | $\sigma_8(2.33)$            | $0.3062^{+0.0053}_{-0.0051}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.73^{+0.50}_{-0.48}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$               | $1.04116^{+0.00057}_{-0.00059}$ | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.7}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.901^{+0.048}_{-0.047}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9969^{+0.0098}_{-0.0095}$    | $z_{\text{drag}}$           | $1059.79^{+0.60}_{-0.62}$       | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{EE}$                             | $0.9924^{+0.0096}_{-0.0093}$    | $r_{\text{drag}}$           | $147.40^{+0.52}_{-0.51}$        | $\chi_{\text{lowl}}^2$      | $22.87 (\nu: 0.3)$           |
| $H_0$                                | $67.71^{+0.91}_{-0.89}$         | $k_D$                       | $0.14051^{+0.00063}_{-0.00063}$ | $\chi_{\text{CamSpec}}^2$   | $11514.6 (\nu: 16.1)$        |
| $\Omega_\Lambda$                     | $0.690^{+0.012}_{-0.012}$       | $100\theta_D$               | $0.16084^{+0.00037}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | $0.045 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.310^{+0.012}_{-0.012}$       | $z_{\text{eq}}$             | $3377^{+46}_{-46}$              | $\chi_{\text{MGS}}^2$       | $1.36 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1419^{+0.0019}_{-0.0019}$    | $k_{\text{eq}}$             | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 0.8)$             |
| $\Omega_m h^3$                       | $0.09611^{+0.00060}_{-0.00064}$ | $100\theta_{\text{eq}}$     | $0.8179^{+0.0087}_{-0.0086}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                           | $0.807^{+0.014}_{-0.014}$       | $100\theta_{s,\text{eq}}$   | $0.4518^{+0.0045}_{-0.0044}$    | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.5)$             |
| $S_8$                                | $0.819^{+0.025}_{-0.025}$       | $H(0.15)$                   | $72.97^{+0.79}_{-0.76}$         | $\chi_{\text{CMB}}^2$       | $11934.5 (\nu: 16.4)$        |

$$\bar{\chi}_{\text{eff}}^2 = 11948.28; R - 1 = 0.01864$$



## 2.9 base\_CamSpecHM\_TTTEE\_lowl\_lowE\_post\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02242^{+0.00029}_{-0.00029}$ | $S_8$                       | $0.810^{+0.030}_{-0.029}$       | $100\theta_{s,eq}$          | $0.4538^{+0.0056}_{-0.0056}$ |
| $\Omega_c h^2$              | $0.1181^{+0.0026}_{-0.0025}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.444^{+0.016}_{-0.016}$       | $H(0.15)$                   | $73.34^{+0.94}_{-0.98}$      |
| $100\theta_{MC}$            | $1.04108^{+0.00059}_{-0.00063}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.597^{+0.016}_{-0.015}$       | $D_M(0.15)$                 | $636.8^{+9.7}_{-9.3}$        |
| $\tau$                      | $0.055^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | $0.974^{+0.023}_{-0.022}$       | $H(0.38)$                   | $83.32^{+0.70}_{-0.72}$      |
| $\ln(10^{10} A_s)$          | $3.041^{+0.031}_{-0.032}$       | $r_{drag} h$                | $100.5^{+2.1}_{-2.0}$           | $D_M(0.38)$                 | $1520^{+19}_{-18}$           |
| $n_s$                       | $0.9696^{+0.0086}_{-0.0085}$    | $\langle d^2 \rangle^{1/2}$ | $2.412^{+0.054}_{-0.052}$       | $H(0.51)$                   | $89.96^{+0.56}_{-0.56}$      |
| $y_{cal}$                   | $1.0006^{+0.0048}_{-0.0050}$    | $z_{re}$                    | $7.7^{+1.5}_{-1.6}$             | $D_M(0.51)$                 | $1971^{+23}_{-21}$           |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $10^9 A_s$                  | $2.092^{+0.066}_{-0.066}$       | $H(0.61)$                   | $95.52^{+0.45}_{-0.45}$      |
| $A_{143}^{PS}$              | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.022}_{-0.023}$       | $D_M(0.61)$                 | $2294^{+25}_{-23}$           |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1219^{+25}_{-24}$              | $H(2.33)$                   | $235.3^{+1.6}_{-1.6}$        |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{220}$                   | $5729^{+78}_{-73}$              | $D_M(2.33)$                 | $5755^{+21}_{-20}$           |
| $A_{143}^{tSZ}$             | $< 7.69$                        | $D_{810}$                   | $2535^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.449^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $817.0^{+9.2}_{-9.5}$           | $\sigma_8(0.15)$            | $0.744^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.8^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | $0.469^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9696^{+0.0086}_{-0.0085}$    | $\sigma_8(0.38)$            | $0.660^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24541^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.51)$           | $0.468^{+0.011}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.02^{+0.40}_{-0.40}$          | $Y_P^{BBN}$                 | $0.24674^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.618^{+0.011}_{-0.010}$    |
| $A_{143}^{dust}$            | $0.96^{+0.33}_{-0.35}$          | $10^5 D/H$                  | $2.577^{+0.055}_{-0.053}$       | $f\sigma_8(0.61)$           | $0.464^{+0.011}_{-0.010}$    |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $Age/Gyr$                   | $13.779^{+0.047}_{-0.045}$      | $\sigma_8(0.61)$            | $0.589^{+0.010}_{-0.0096}$   |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | $1089.69^{+0.52}_{-0.51}$       | $f\sigma_8(2.33)$           | $0.2971^{+0.0050}_{-0.0048}$ |
| $c_{100}$                   | $0.9976^{+0.0020}_{-0.0020}$    | $r_*$                       | $144.90^{+0.58}_{-0.59}$        | $\sigma_8(2.33)$            | $0.3066^{+0.0050}_{-0.0051}$ |
| $c_{217}$                   | $1.0011^{+0.0032}_{-0.0030}$    | $100\theta_*$               | $1.04126^{+0.00058}_{-0.00062}$ | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{TE}$                    | $0.9969^{+0.010}_{-0.0094}$     | $D_M(z_*)/Gpc$              | $13.916^{+0.054}_{-0.056}$      | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.9}$        |
| $c_{EE}$                    | $0.9925^{+0.0096}_{-0.0094}$    | $z_{drag}$                  | $1059.91^{+0.59}_{-0.63}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $68.1^{+1.1}_{-1.1}$            | $r_{drag}$                  | $147.55^{+0.56}_{-0.60}$        | $\chi_{simall}^2$           | $397.1 (\nu: 1.6)$           |
| $\Omega_\Lambda$            | $0.696^{+0.015}_{-0.016}$       | $k_D$                       | $0.14042^{+0.00067}_{-0.00068}$ | $\chi_{lowl}^2$             | $22.52 (\nu: 0.3)$           |
| $\Omega_m$                  | $0.304^{+0.016}_{-0.015}$       | $100\theta_D$               | $0.16078^{+0.00037}_{-0.00034}$ | $\chi_{CamSpec}^2$          | $11516.4 (\nu: 20.7)$        |
| $\Omega_m h^2$              | $0.1411^{+0.0024}_{-0.0024}$    | $z_{eq}$                    | $3357^{+58}_{-57}$              | $\chi_{H073p45}^2$          | $10.3 (\nu: 2.5)$            |
| $\Omega_m h^3$              | $0.09615^{+0.00061}_{-0.00061}$ | $k_{eq}$                    | $0.01025^{+0.00018}_{-0.00017}$ | $\chi_{prior}^2$            | $7.8 (\nu: 6.0)$             |
| $\sigma_8$                  | $0.804^{+0.015}_{-0.015}$       | $100\theta_{eq}$            | $0.822^{+0.011}_{-0.011}$       | $\chi_{CMB}^2$              | $11936.1 (\nu: 20.0)$        |

$$\bar{\chi}_{eff}^2 = 11954.26; R - 1 = 0.03390$$



## 2.10 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02230^{+0.00031}_{-0.00031}$ | $S_8$                       | $0.828^{+0.031}_{-0.032}$       | $100\theta_{s,eq}$          | $0.4504^{+0.0060}_{-0.0058}$ |
| $\Omega_c h^2$              | $0.1196^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.017}_{-0.017}$       | $H(0.15)$                   | $72.7^{+1.1}_{-1.0}$         |
| $100\theta_{MC}$            | $1.04089^{+0.00060}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $643^{+10}_{-10}$            |
| $\tau$                      | $0.054^{+0.013}_{-0.011}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.023}_{-0.022}$       | $H(0.38)$                   | $82.88^{+0.76}_{-0.73}$      |
| $\ln(10^{10} A_s)$          | $3.042^{+0.028}_{-0.026}$       | $r_{drag} h$                | $99.3^{+2.1}_{-2.1}$            | $D_M(0.38)$                 | $1533^{+20}_{-21}$           |
| $n_s$                       | $0.9660^{+0.0086}_{-0.0087}$    | $\langle d^2 \rangle^{1/2}$ | $2.437^{+0.054}_{-0.053}$       | $H(0.51)$                   | $89.62^{+0.60}_{-0.58}$      |
| $y_{cal}$                   | $1.0005^{+0.0049}_{-0.0049}$    | $z_{re}$                    | $< 8.88$                        | $D_M(0.51)$                 | $1985^{+24}_{-24}$           |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $10^9 A_s$                  | $2.095^{+0.058}_{-0.054}$       | $H(0.61)$                   | $95.25^{+0.49}_{-0.46}$      |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.023}_{-0.022}$       | $D_M(0.61)$                 | $2310^{+26}_{-26}$           |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1226^{+25}_{-25}$              | $H(2.33)$                   | $236.2^{+1.6}_{-1.6}$        |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{220}$                   | $5718^{+77}_{-75}$              | $D_M(2.33)$                 | $5766^{+22}_{-22}$           |
| $A_{143}^{tSZ}$             | $< 7.48$                        | $D_{810}$                   | $2535^{+26}_{-26}$              | $f\sigma_8(0.15)$           | $0.458^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $815.7^{+9.4}_{-9.4}$           | $\sigma_8(0.15)$            | $0.748^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9660^{+0.0086}_{-0.0087}$    | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0094}$   |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24536^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | $0.474^{+0.011}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6200^{+0.0092}_{-0.0086}$ |
| $A_{143}^{dust}$            | $0.96^{+0.35}_{-0.35}$          | $10^5 D/H$                  | $2.600^{+0.059}_{-0.057}$       | $f\sigma_8(0.61)$           | $0.469^{+0.010}_{-0.010}$    |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | $13.804^{+0.049}_{-0.049}$      | $\sigma_8(0.61)$            | $0.5899^{+0.0087}_{-0.0081}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | $1089.98^{+0.56}_{-0.55}$       | $f\sigma_8(2.33)$           | $0.2973^{+0.0043}_{-0.0040}$ |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0020}$    | $r_*$                       | $144.59^{+0.62}_{-0.61}$        | $\sigma_8(2.33)$            | $0.3065^{+0.0045}_{-0.0041}$ |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | $1.04108^{+0.00060}_{-0.00059}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{TE}$                    | $0.9966^{+0.0097}_{-0.0096}$    | $D_M(z_*)/\text{Gpc}$       | $13.889^{+0.058}_{-0.057}$      | $f_{2000}^{217}$            | $106.9^{+3.8}_{-3.7}$        |
| $c_{EE}$                    | $0.9921^{+0.0097}_{-0.0094}$    | $z_{drag}$                  | $1059.74^{+0.61}_{-0.65}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $67.4^{+1.2}_{-1.2}$            | $r_{drag}$                  | $147.28^{+0.62}_{-0.61}$        | $\chi_{simall}^2$           | $396.8 (\nu: 1.4)$           |
| $\Omega_\Lambda$            | $0.686^{+0.016}_{-0.017}$       | $k_D$                       | $0.14061^{+0.00067}_{-0.00068}$ | $\chi_{lowl}^2$             | $23.17 (\nu: 0.4)$           |
| $\Omega_m$                  | $0.314^{+0.017}_{-0.016}$       | $100\theta_D$               | $0.16087^{+0.00038}_{-0.00037}$ | $\chi_{CamSpec}^2$          | $11514.3 (\nu: 15.7)$        |
| $\Omega_m h^2$              | $0.1425^{+0.0026}_{-0.0025}$    | $z_{eq}$                    | $3391^{+61}_{-61}$              | $\chi_{prior}^2$            | $7.8 (\nu: 6.0)$             |
| $\Omega_m h^3$              | $0.09610^{+0.00061}_{-0.00062}$ | $k_{eq}$                    | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{CMB}^2$              | $11934.4 (\nu: 16.0)$        |
| $\sigma_8$                  | $0.809^{+0.014}_{-0.013}$       | $100\theta_{eq}$            | $0.815^{+0.012}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11942.19; R - 1 = 0.01099$$



## 2.11 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00028}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | $640.3^{+7.7}_{-7.7}$        |
| $\Omega_c h^2$                       | $0.1189^{+0.0020}_{-0.0020}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.013}_{-0.013}$       | $H(0.38)$                   | $83.06^{+0.57}_{-0.57}$      |
| $100\theta_{MC}$                     | $1.04097^{+0.00057}_{-0.00059}$ | $\sigma_8/h^{0.5}$          | $0.981^{+0.019}_{-0.019}$       | $D_M(0.38)$                 | $1528^{+15}_{-16}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$         | $99.8^{+1.5}_{-1.5}$            | $H(0.51)$                   | $89.75^{+0.46}_{-0.46}$      |
| $\ln(10^{10} A_s)$                   | $3.042^{+0.028}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$ | $2.427^{+0.047}_{-0.045}$       | $D_M(0.51)$                 | $1979^{+18}_{-18}$           |
| $n_s$                                | $0.9675^{+0.0076}_{-0.0076}$    | $z_{\text{re}}$             | $< 8.93$                        | $H(0.61)$                   | $95.36^{+0.39}_{-0.38}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | $2.095^{+0.060}_{-0.055}$       | $D_M(0.61)$                 | $2303^{+19}_{-20}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.021}_{-0.021}$       | $H(2.33)$                   | $235.8^{+1.2}_{-1.3}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1223^{+24}_{-23}$              | $D_M(2.33)$                 | $5762^{+19}_{-18}$           |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{220}$                   | $5722^{+77}_{-73}$              | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                  | $816.1^{+9.4}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.473^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.24}_{-0.25}$          | $D_{2000}$                  | $230.4^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0094}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9675^{+0.0076}_{-0.0076}$    | $f\sigma_8(0.51)$           | $0.4716^{+0.0098}_{-0.0096}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.6196^{+0.0093}_{-0.0087}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4668^{+0.0091}_{-0.0088}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.37}_{-0.38}$          | $10^5 \text{D}/\text{H}$    | $2.591^{+0.055}_{-0.051}$       | $\sigma_8(0.61)$            | $0.5896^{+0.0088}_{-0.0082}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.36}$          | $\text{Age}/\text{Gyr}$     | $13.794^{+0.042}_{-0.042}$      | $f\sigma_8(2.33)$           | $0.2974^{+0.0044}_{-0.0041}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.86^{+0.46}_{-0.45}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0046}_{-0.0042}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.32}$          | $r_*$                       | $144.73^{+0.50}_{-0.48}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$               | $1.04116^{+0.00057}_{-0.00059}$ | $f_{2000}^{217}$            | $106.7^{+3.7}_{-3.7}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.901^{+0.048}_{-0.047}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9968^{+0.0098}_{-0.0095}$    | $z_{\text{drag}}$           | $1059.79^{+0.64}_{-0.62}$       | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.5)$           |
| $c_{EE}$                             | $0.9923^{+0.0097}_{-0.0093}$    | $r_{\text{drag}}$           | $147.41^{+0.52}_{-0.51}$        | $\chi_{\text{lowl}}^2$      | $22.88 (\nu: 0.3)$           |
| $H_0$                                | $67.73^{+0.90}_{-0.89}$         | $k_D$                       | $0.14051^{+0.00063}_{-0.00064}$ | $\chi_{\text{CamSpec}}^2$   | $11514.4 (\nu: 15.8)$        |
| $\Omega_\Lambda$                     | $0.691^{+0.012}_{-0.012}$       | $100\theta_D$               | $0.16084^{+0.00038}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | $0.044 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.309^{+0.012}_{-0.012}$       | $z_{\text{eq}}$             | $3376^{+46}_{-46}$              | $\chi_{\text{MGS}}^2$       | $1.37 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1419^{+0.0019}_{-0.0019}$    | $k_{\text{eq}}$             | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\text{DR12BAO}}^2$   | $4.5 (\nu: 0.8)$             |
| $\Omega_m h^3$                       | $0.09611^{+0.00061}_{-0.00064}$ | $100\theta_{\text{eq}}$     | $0.8180^{+0.0087}_{-0.0086}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                           | $0.808^{+0.013}_{-0.012}$       | $100\theta_{s,\text{eq}}$   | $0.4519^{+0.0045}_{-0.0044}$    | $\chi_{\text{BAO}}^2$       | $5.96 (\nu: 0.5)$            |
| $S_8$                                | $0.820^{+0.025}_{-0.025}$       | $H(0.15)$                   | $72.98^{+0.79}_{-0.77}$         | $\chi_{\text{CMB}}^2$       | $11934.2 (\nu: 16.1)$        |

$$\bar{\chi}_{\text{eff}}^2 = 11947.99; R - 1 = 0.01741$$



## 2.12 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02242^{+0.00028}_{-0.00030}$ | $S_8$                       | $0.810^{+0.030}_{-0.030}$       | $100\theta_{s,eq}$          | $0.4539^{+0.0056}_{-0.0056}$ |
| $\Omega_c h^2$              | $0.1180^{+0.0025}_{-0.0025}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.444^{+0.016}_{-0.016}$       | $H(0.15)$                   | $73.36^{+0.92}_{-0.98}$      |
| $100\theta_{MC}$            | $1.04108^{+0.00057}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.598^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $636.6^{+9.6}_{-9.2}$        |
| $\tau$                      | $0.056^{+0.013}_{-0.013}$       | $\sigma_8/h^{0.5}$          | $0.975^{+0.022}_{-0.022}$       | $H(0.38)$                   | $83.33^{+0.69}_{-0.71}$      |
| $\ln(10^{10} A_s)$          | $3.043^{+0.030}_{-0.026}$       | $r_{drag} h$                | $100.6^{+2.1}_{-2.0}$           | $D_M(0.38)$                 | $1520^{+19}_{-18}$           |
| $n_s$                       | $0.9697^{+0.0087}_{-0.0083}$    | $\langle d^2 \rangle^{1/2}$ | $2.414^{+0.053}_{-0.050}$       | $H(0.51)$                   | $89.97^{+0.55}_{-0.56}$      |
| $y_{cal}$                   | $1.0006^{+0.0047}_{-0.0050}$    | $z_{re}$                    | $< 8.99$                        | $D_M(0.51)$                 | $1971^{+23}_{-21}$           |
| $A_{100}^{PS}$              | $239^{+50}_{-50}$               | $10^9 A_s$                  | $2.096^{+0.060}_{-0.057}$       | $H(0.61)$                   | $95.53^{+0.45}_{-0.45}$      |
| $A_{143}^{PS}$              | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.022}_{-0.023}$       | $D_M(0.61)$                 | $2294^{+24}_{-23}$           |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1219^{+25}_{-25}$              | $H(2.33)$                   | $235.3^{+1.6}_{-1.5}$        |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{220}$                   | $5729^{+79}_{-73}$              | $D_M(2.33)$                 | $5754^{+21}_{-20}$           |
| $A_{143}^{tSZ}$             | $< 7.69$                        | $D_{810}$                   | $2535^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.449^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $817.0^{+9.1}_{-9.4}$           | $\sigma_8(0.15)$            | $0.745^{+0.013}_{-0.011}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.8^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | $0.469^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9697^{+0.0087}_{-0.0083}$    | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.0095}$   |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24541^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.51)$           | $0.468^{+0.011}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.02^{+0.40}_{-0.40}$          | $Y_P^{BBN}$                 | $0.24674^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.619^{+0.010}_{-0.0087}$   |
| $A_{143}^{dust}$            | $0.96^{+0.34}_{-0.34}$          | $10^5 D/H$                  | $2.576^{+0.054}_{-0.053}$       | $f\sigma_8(0.61)$           | $0.464^{+0.010}_{-0.010}$    |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.19}$          | $Age/Gyr$                   | $13.778^{+0.047}_{-0.044}$      | $\sigma_8(0.61)$            | $0.5892^{+0.0096}_{-0.0084}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.33}$          | $z_*$                       | $1089.68^{+0.52}_{-0.51}$       | $f\sigma_8(2.33)$           | $0.2974^{+0.0044}_{-0.0042}$ |
| $c_{100}$                   | $0.9976^{+0.0020}_{-0.0020}$    | $r_*$                       | $144.91^{+0.58}_{-0.59}$        | $\sigma_8(2.33)$            | $0.3069^{+0.0046}_{-0.0043}$ |
| $c_{217}$                   | $1.0011^{+0.0032}_{-0.0031}$    | $100\theta_*$               | $1.04126^{+0.00056}_{-0.00061}$ | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{TE}$                    | $0.997^{+0.010}_{-0.0094}$      | $D_M(z_*)/Gpc$              | $13.916^{+0.054}_{-0.056}$      | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.9}$        |
| $c_{EE}$                    | $0.9925^{+0.0098}_{-0.0093}$    | $z_{drag}$                  | $1059.92^{+0.59}_{-0.63}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $68.2^{+1.1}_{-1.1}$            | $r_{drag}$                  | $147.56^{+0.56}_{-0.60}$        | $\chi_{simall}^2$           | $397.1 (\nu: 1.6)$           |
| $\Omega_\Lambda$            | $0.696^{+0.015}_{-0.015}$       | $k_D$                       | $0.14041^{+0.00067}_{-0.00068}$ | $\chi_{lowl}^2$             | $22.52 (\nu: 0.3)$           |
| $\Omega_m$                  | $0.304^{+0.015}_{-0.015}$       | $100\theta_D$               | $0.16077^{+0.00037}_{-0.00034}$ | $\chi_{CamSpec}^2$          | $11516.3 (\nu: 20.8)$        |
| $\Omega_m h^2$              | $0.1411^{+0.0024}_{-0.0024}$    | $z_{eq}$                    | $3356^{+58}_{-58}$              | $\chi_{H073p45}^2$          | $10.3 (\nu: 2.5)$            |
| $\Omega_m h^3$              | $0.09615^{+0.00062}_{-0.00061}$ | $k_{eq}$                    | $0.01024^{+0.00018}_{-0.00018}$ | $\chi_{prior}^2$            | $7.8 (\nu: 6.0)$             |
| $\sigma_8$                  | $0.805^{+0.014}_{-0.013}$       | $100\theta_{eq}$            | $0.822^{+0.011}_{-0.011}$       | $\chi_{CMB}^2$              | $11935.9 (\nu: 20.0)$        |

$$\bar{\chi}_{eff}^2 = 11954.01; R - 1 = 0.03572$$



### 2.13 base\_CamSpecHM\_TE\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02247  | $0.02248^{+0.00050}_{-0.00050}$ | $D_{220}$             | 5719     | $5716^{+120}_{-120}$            | $H(0.38)$          | 83.66    | $83.7^{+1.2}_{-1.2}$         |
| $\Omega_c h^2$              | 0.11696  | $0.1169^{+0.0041}_{-0.0041}$    | $D_{810}$             | 2548     | $2546^{+51}_{-50}$              | $D_M(0.38)$        | 1511.4   | $1511^{+31}_{-31}$           |
| $100\theta_{MC}$            | 1.04140  | $1.04141^{+0.00099}_{-0.0010}$  | $D_{1420}$            | 824.6    | $824^{+24}_{-23}$               | $H(0.51)$          | 90.23    | $90.26^{+0.93}_{-0.92}$      |
| $\tau$                      | 0.0518   | $0.050^{+0.017}_{-0.018}$       | $D_{2000}$            | 233.4    | $233.3^{+8.7}_{-8.5}$           | $D_M(0.51)$        | 1960.2   | $1959^{+36}_{-36}$           |
| $\ln(10^{10} A_s)$          | 3.0345   | $3.031^{+0.039}_{-0.042}$       | $n_{s,0.002}$         | 0.9781   | $0.978^{+0.022}_{-0.022}$       | $H(0.61)$          | 95.73    | $95.76^{+0.77}_{-0.76}$      |
| $n_s$                       | 0.9781   | $0.978^{+0.022}_{-0.022}$       | $Y_P$                 | 0.245433 | $0.24544^{+0.00021}_{-0.00021}$ | $D_M(0.61)$        | 2282.8   | $2282^{+39}_{-39}$           |
| $y_{cal}$                   | 1.00007  | $0.99999^{+0.0049}_{-0.0049}$   | $Y_P^{BBN}$           | 0.246760 | $0.24676^{+0.00021}_{-0.00021}$ | $H(2.33)$          | 234.70   | $234.7^{+2.5}_{-2.5}$        |
| $H_0$                       | 68.68    | $68.7^{+1.9}_{-1.8}$            | $10^5 D/H$            | 2.567    | $2.566^{+0.094}_{-0.090}$       | $D_M(2.33)$        | 5745.7   | $5745^{+34}_{-34}$           |
| $\Omega_\Lambda$            | 0.7030   | $0.703^{+0.023}_{-0.024}$       | Age/Gyr               | 13.760   | $13.757^{+0.077}_{-0.075}$      | $f\sigma_8(0.15)$  | 0.4421   | $0.441^{+0.025}_{-0.025}$    |
| $\Omega_m$                  | 0.2970   | $0.297^{+0.024}_{-0.023}$       | $z_*$                 | 1089.53  | $1089.51^{+0.85}_{-0.82}$       | $\sigma_8(0.15)$   | 0.7415   | $0.740^{+0.020}_{-0.020}$    |
| $\Omega_m h^2$              | 0.14007  | $0.1400^{+0.0039}_{-0.0039}$    | $r_*$                 | 145.15   | $145.2^{+1.0}_{-0.97}$          | $f\sigma_8(0.38)$  | 0.4634   | $0.462^{+0.020}_{-0.021}$    |
| $\Omega_m h^3$              | 0.09620  | $0.0962^{+0.0011}_{-0.0010}$    | $100\theta_*$         | 1.04158  | $1.04158^{+0.00098}_{-0.00099}$ | $\sigma_8(0.38)$   | 0.6589   | $0.658^{+0.016}_{-0.017}$    |
| $\sigma_8$                  | 0.8009   | $0.799^{+0.022}_{-0.023}$       | $D_M(z_*)/\text{Gpc}$ | 13.935   | $13.936^{+0.093}_{-0.091}$      | $f\sigma_8(0.51)$  | 0.4638   | $0.463^{+0.018}_{-0.019}$    |
| $S_8$                       | 0.7968   | $0.795^{+0.048}_{-0.048}$       | $z_{drag}$            | 1059.93  | $1060.0^{+1.1}_{-1.1}$          | $\sigma_8(0.51)$   | 0.6173   | $0.616^{+0.015}_{-0.016}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4364   | $0.435^{+0.026}_{-0.026}$       | $r_{drag}$            | 147.79   | $147.8^{+1.0}_{-1.0}$           | $f\sigma_8(0.61)$  | 0.4600   | $0.459^{+0.016}_{-0.017}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5912   | $0.590^{+0.025}_{-0.026}$       | $k_D$                 | 0.14021  | $0.1402^{+0.0012}_{-0.0012}$    | $\sigma_8(0.61)$   | 0.5878   | $0.587^{+0.014}_{-0.015}$    |
| $\sigma_8/h^{0.5}$          | 0.9664   | $0.964^{+0.035}_{-0.036}$       | $100\theta_D$         | 0.16079  | $0.16078^{+0.00063}_{-0.00061}$ | $f\sigma_8(2.33)$  | 0.2970   | $0.2964^{+0.0070}_{-0.0072}$ |
| $r_{drag} h$                | 101.50   | $101.6^{+3.3}_{-3.2}$           | $z_{eq}$              | 3332     | $3331^{+94}_{-93}$              | $\sigma_8(2.33)$   | 0.3068   | $0.3063^{+0.0071}_{-0.0074}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.376    | $2.370^{+0.084}_{-0.085}$       | $k_{eq}$              | 0.010169 | $0.01017^{+0.00029}_{-0.00029}$ | $\chi^2_{small}$   | 395.67   | $396.9 (\nu: 1.3)$           |
| $z_{re}$                    | 7.36     | $7.2^{+1.8}_{-1.8}$             | $100\theta_{eq}$      | 0.8267   | $0.827^{+0.018}_{-0.018}$       | $\chi^2_{CamSpec}$ | 2575.9   | $2581.0 (\nu: 5.1)$          |
| $10^9 A_s$                  | 2.079    | $2.072^{+0.081}_{-0.086}$       | $100\theta_{s,eq}$    | 0.4563   | $0.4565^{+0.0094}_{-0.0092}$    | $\chi^2_{prior}$   | 10.03    | $11.0 (\nu: 1.0)$            |
| $10^9 A_s e^{-2\tau}$       | 1.8744   | $1.873^{+0.038}_{-0.038}$       | $H(0.15)$             | 73.80    | $73.8^{+1.6}_{-1.6}$            | $\chi^2_{CMB}$     | 2971.6   | $2977.9 (\nu: 6.5)$          |
| $D_{40}$                    | 1201     | $1200^{+52}_{-52}$              | $D_M(0.15)$           | 632.3    | $632^{+15}_{-15}$               |                    |          |                              |

Best-fit  $\chi^2_{eff} = 2981.64$ ;  $\bar{\chi}^2_{eff} = 2988.91$ ;  $R - 1 = 0.00640$

$\chi^2_{eff}$ : CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.67 CamSpec like\_10.7HM\_1400\_unified: 2575.95



## 2.14 base\_CamSpecHM\_TE\_lowE\_post\_zre6p5

| Parameter                          | 95% limits                      | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.02249^{+0.00051}_{-0.00050}$ | $D_{220}$                      | $5716^{+120}_{-120}$            | $H(0.38)$                 | $83.7^{+1.2}_{-1.1}$         |
| $\Omega_{\text{c}}h^2$             | $0.1168^{+0.0041}_{-0.0040}$    | $D_{810}$                      | $2547^{+51}_{-50}$              | $D_{\text{M}}(0.38)$      | $1510^{+31}_{-30}$           |
| $100\theta_{\text{MC}}$            | $1.04141^{+0.00099}_{-0.0010}$  | $D_{1420}$                     | $825^{+24}_{-23}$               | $H(0.51)$                 | $90.28^{+0.93}_{-0.92}$      |
| $\tau$                             | $0.054^{+0.012}_{-0.010}$       | $D_{2000}$                     | $233.6^{+8.7}_{-8.5}$           | $D_{\text{M}}(0.51)$      | $1959^{+36}_{-36}$           |
| $\ln(10^{10}A_{\text{s}})$         | $3.037^{+0.033}_{-0.031}$       | $n_{\text{s},0.002}$           | $0.979^{+0.022}_{-0.022}$       | $H(0.61)$                 | $95.77^{+0.76}_{-0.75}$      |
| $n_{\text{s}}$                     | $0.979^{+0.022}_{-0.022}$       | $Y_{\text{P}}$                 | $0.24544^{+0.00021}_{-0.00020}$ | $D_{\text{M}}(0.61)$      | $2281^{+39}_{-39}$           |
| $y_{\text{cal}}$                   | $0.99997^{+0.0049}_{-0.0050}$   | $Y_{\text{P}}^{\text{BBN}}$    | $0.24677^{+0.00021}_{-0.00020}$ | $H(2.33)$                 | $234.6^{+2.5}_{-2.5}$        |
| $H_0$                              | $68.8^{+1.8}_{-1.8}$            | $10^5 D/\text{H}$              | $2.564^{+0.093}_{-0.091}$       | $D_{\text{M}}(2.33)$      | $5744^{+34}_{-34}$           |
| $\Omega_{\Lambda}$                 | $0.704^{+0.023}_{-0.024}$       | Age/Gyr                        | $13.756^{+0.077}_{-0.074}$      | $f\sigma_8(0.15)$         | $0.442^{+0.024}_{-0.025}$    |
| $\Omega_{\text{m}}$                | $0.296^{+0.024}_{-0.023}$       | $z_*$                          | $1089.49^{+0.84}_{-0.82}$       | $\sigma_8(0.15)$          | $0.742^{+0.018}_{-0.018}$    |
| $\Omega_{\text{m}}h^2$             | $0.1400^{+0.0039}_{-0.0039}$    | $r_*$                          | $145.2^{+1.0}_{-0.97}$          | $f\sigma_8(0.38)$         | $0.464^{+0.020}_{-0.021}$    |
| $\Omega_{\text{m}}h^3$             | $0.0962^{+0.0011}_{-0.0011}$    | $100\theta_*$                  | $1.04159^{+0.00098}_{-0.00098}$ | $\sigma_8(0.38)$          | $0.660^{+0.015}_{-0.014}$    |
| $\sigma_8$                         | $0.802^{+0.021}_{-0.021}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.937^{+0.093}_{-0.091}$      | $f\sigma_8(0.51)$         | $0.464^{+0.017}_{-0.018}$    |
| $S_8$                              | $0.797^{+0.047}_{-0.048}$       | $z_{\text{drag}}$              | $1060.0^{+1.1}_{-1.1}$          | $\sigma_8(0.51)$          | $0.618^{+0.014}_{-0.013}$    |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.436^{+0.026}_{-0.026}$       | $r_{\text{drag}}$              | $147.8^{+1.0}_{-1.0}$           | $f\sigma_8(0.61)$         | $0.460^{+0.016}_{-0.017}$    |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.591^{+0.024}_{-0.025}$       | $k_{\text{D}}$                 | $0.1402^{+0.0012}_{-0.0012}$    | $\sigma_8(0.61)$          | $0.589^{+0.013}_{-0.012}$    |
| $\sigma_8/h^{0.5}$                 | $0.967^{+0.033}_{-0.035}$       | $100\theta_{\text{D}}$         | $0.16077^{+0.00062}_{-0.00062}$ | $f\sigma_8(2.33)$         | $0.2974^{+0.0063}_{-0.0056}$ |
| $r_{\text{drag}}h$                 | $101.6^{+3.2}_{-3.2}$           | $z_{\text{eq}}$                | $3329^{+93}_{-93}$              | $\sigma_8(2.33)$          | $0.3073^{+0.0062}_{-0.0058}$ |
| $\langle d^2 \rangle^{1/2}$        | $2.376^{+0.083}_{-0.083}$       | $k_{\text{eq}}$                | $0.01016^{+0.00028}_{-0.00028}$ | $\chi_{\text{simall}}^2$  | $396.4 (\nu: 0.7)$           |
| $z_{\text{re}}$                    | $< 8.65$                        | $100\theta_{\text{eq}}$        | $0.827^{+0.018}_{-0.018}$       | $\chi_{\text{CamSpec}}^2$ | $2581.0 (\nu: 5.1)$          |
| $10^9 A_{\text{s}}$                | $2.085^{+0.068}_{-0.064}$       | $100\theta_{\text{s,eq}}$      | $0.4567^{+0.0094}_{-0.0092}$    | $\chi_{\text{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_{\text{s}}e^{-2\tau}$      | $1.873^{+0.038}_{-0.038}$       | $H(0.15)$                      | $73.9^{+1.6}_{-1.6}$            | $\chi_{\text{CMB}}^2$     | $2977.5 (\nu: 5.8)$          |
| $D_{40}$                           | $1199^{+52}_{-51}$              | $D_{\text{M}}(0.15)$           | $632^{+15}_{-15}$               |                           |                              |

$\bar{\chi}_{\text{eff}}^2 = 2988.52$ ;  $R - 1 = 0.00517$



## 2.15 base\_CamSpecHM\_EE\_lowE

| Parameter                   | Best fit | 95% limits                   | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02320  | $0.0233^{+0.0024}_{-0.0022}$ | $D_{220}$             | 5947     | $5950^{+380}_{-370}$            | $H(0.38)$          | 83.13    | $83.3^{+3.6}_{-3.5}$         |
| $\Omega_c h^2$              | 0.1197   | $0.1192^{+0.0093}_{-0.0090}$ | $D_{810}$             | 2598     | $2597^{+77}_{-75}$              | $D_M(0.38)$        | 1528     | $1525^{+91}_{-91}$           |
| $100\theta_{MC}$            | 1.03933  | $1.0393^{+0.0017}_{-0.0017}$ | $D_{1420}$            | 839.2    | $840^{+37}_{-36}$               | $H(0.51)$          | 89.90    | $90.1^{+3.0}_{-2.9}$         |
| $\tau$                      | 0.0500   | $0.050^{+0.017}_{-0.018}$    | $D_{2000}$            | 238.6    | $239^{+14}_{-14}$               | $D_M(0.51)$        | 1979     | $1975^{+110}_{-110}$         |
| $\ln(10^{10} A_s)$          | 3.0583   | $3.058^{+0.043}_{-0.043}$    | $n_{s,0.002}$         | 0.9650   | $0.967^{+0.028}_{-0.026}$       | $H(0.61)$          | 95.55    | $95.7^{+2.6}_{-2.5}$         |
| $n_s$                       | 0.9650   | $0.967^{+0.028}_{-0.026}$    | $Y_P$                 | 0.24574  | $0.24575^{+0.00093}_{-0.00091}$ | $D_M(0.61)$        | 2302     | $2298^{+120}_{-120}$         |
| $y_{cal}$                   | 0.99999  | $1.0000^{+0.0049}_{-0.0049}$ | $Y_P^{BBN}$           | 0.24707  | $0.24708^{+0.00094}_{-0.00091}$ | $H(2.33)$          | 237.00   | $236.8^{+4.5}_{-4.1}$        |
| $H_0$                       | 67.6     | $67.9^{+5.3}_{-5.0}$         | $10^5 D/H$            | 2.439    | $2.44^{+0.40}_{-0.37}$          | $D_M(2.33)$        | 5748     | $5743^{+120}_{-130}$         |
| $\Omega_\Lambda$            | 0.686    | $0.687^{+0.060}_{-0.065}$    | Age/Gyr               | 13.760   | $13.75^{+0.27}_{-0.30}$         | $f\sigma_8(0.15)$  | 0.459    | $0.456^{+0.058}_{-0.057}$    |
| $\Omega_m$                  | 0.314    | $0.313^{+0.065}_{-0.060}$    | $z_*$                 | 1088.88  | $1088.8^{+3.4}_{-3.2}$          | $\sigma_8(0.15)$   | 0.7490   | $0.747^{+0.026}_{-0.028}$    |
| $\Omega_m h^2$              | 0.1435   | $0.1431^{+0.0076}_{-0.0072}$ | $r_*$                 | 143.89   | $143.9^{+1.3}_{-1.3}$           | $f\sigma_8(0.38)$  | 0.4764   | $0.474^{+0.044}_{-0.045}$    |
| $\Omega_m h^3$              | 0.09705  | $0.0971^{+0.0035}_{-0.0031}$ | $100\theta_*$         | 1.03943  | $1.0394^{+0.0017}_{-0.0016}$    | $\sigma_8(0.38)$   | 0.6637   | $0.662^{+0.018}_{-0.020}$    |
| $\sigma_8$                  | 0.8108   | $0.809^{+0.033}_{-0.036}$    | $D_M(z_*)/\text{Gpc}$ | 13.843   | $13.85^{+0.12}_{-0.12}$         | $f\sigma_8(0.51)$  | 0.4747   | $0.473^{+0.036}_{-0.039}$    |
| $S_8$                       | 0.829    | $0.83^{+0.12}_{-0.11}$       | $z_{drag}$            | 1061.80  | $1061.9^{+4.7}_{-4.5}$          | $\sigma_8(0.51)$   | 0.6210   | $0.620^{+0.016}_{-0.017}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.454    | $0.452^{+0.064}_{-0.060}$    | $r_{drag}$            | 146.27   | $146.3^{+1.3}_{-1.3}$           | $f\sigma_8(0.61)$  | 0.4696   | $0.468^{+0.031}_{-0.034}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.607    | $0.604^{+0.054}_{-0.053}$    | $k_D$                 | 0.14235  | $0.1423^{+0.0024}_{-0.0024}$    | $\sigma_8(0.61)$   | 0.5908   | $0.590^{+0.014}_{-0.016}$    |
| $\sigma_8/h^{0.5}$          | 0.986    | $0.982^{+0.075}_{-0.076}$    | $100\theta_D$         | 0.15943  | $0.1594^{+0.0027}_{-0.0024}$    | $f\sigma_8(2.33)$  | 0.2978   | $0.2974^{+0.0068}_{-0.0069}$ |
| $r_{drag} h$                | 98.9     | $99.3^{+7.8}_{-7.5}$         | $z_{eq}$              | 3414     | $3405^{+180}_{-170}$            | $\sigma_8(2.33)$   | 0.3069   | $0.3067^{+0.0073}_{-0.0074}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.457    | $2.45^{+0.15}_{-0.15}$       | $k_{eq}$              | 0.01042  | $0.01039^{+0.00055}_{-0.00053}$ | $\chi_{simall}^2$  | 395.62   | $396.8 (\nu: 1.2)$           |
| $z_{re}$                    | 7.06     | $7.1^{+1.7}_{-1.8}$          | $100\theta_{eq}$      | 0.8123   | $0.814^{+0.037}_{-0.036}$       | $\chi_{CamSpec}^2$ | 1886.5   | $1891.5 (\nu: 4.9)$          |
| $10^9 A_s$                  | 2.129    | $2.130^{+0.092}_{-0.091}$    | $100\theta_{s,eq}$    | 0.4482   | $0.449^{+0.018}_{-0.018}$       | $\chi_{prior}^2$   | 10.03    | $11.0 (\nu: 1.0)$            |
| $10^9 A_s e^{-2\tau}$       | 1.9264   | $1.925^{+0.048}_{-0.047}$    | $H(0.15)$             | 72.95    | $73.2^{+4.8}_{-4.4}$            | $\chi_{CMB}^2$     | 2282.1   | $2288.3 (\nu: 6.1)$          |
| $D_{40}$                    | 1265     | $1260^{+61}_{-60}$           | $D_M(0.15)$           | 640.9    | $639^{+45}_{-44}$               |                    |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 2292.16$ ;  $\bar{\chi}_{\text{eff}}^2 = 2299.35$ ;  $R - 1 = 0.00959$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.62 CamSpec like\_10.7HM\_1400\_unified: 1886.52



## 2.16 base\_CamSpecHM\_EE\_lowE\_post\_zre6p5

| Parameter                          | 95% limits                   | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.0233^{+0.0023}_{-0.0022}$ | $D_{220}$                      | $5943^{+370}_{-370}$            | $H(0.38)$                 | $83.3^{+3.5}_{-3.5}$         |
| $\Omega_{\text{c}}h^2$             | $0.1192^{+0.0093}_{-0.0091}$ | $D_{810}$                      | $2596^{+76}_{-75}$              | $D_{\text{M}}(0.38)$      | $1525^{+91}_{-91}$           |
| $100\theta_{\text{MC}}$            | $1.0393^{+0.0017}_{-0.0017}$ | $D_{1420}$                     | $839^{+37}_{-36}$               | $H(0.51)$                 | $90.0^{+3.0}_{-2.9}$         |
| $\tau$                             | $0.054^{+0.013}_{-0.011}$    | $D_{2000}$                     | $239^{+14}_{-14}$               | $D_{\text{M}}(0.51)$      | $1976^{+110}_{-110}$         |
| $\ln(10^{10}A_{\text{s}})$         | $3.065^{+0.038}_{-0.035}$    | $n_{\text{s},0.002}$           | $0.968^{+0.028}_{-0.026}$       | $H(0.61)$                 | $95.7^{+2.6}_{-2.5}$         |
| $n_{\text{s}}$                     | $0.968^{+0.028}_{-0.026}$    | $Y_{\text{P}}$                 | $0.24574^{+0.00093}_{-0.00090}$ | $D_{\text{M}}(0.61)$      | $2299^{+120}_{-120}$         |
| $y_{\text{cal}}$                   | $1.0000^{+0.0049}_{-0.0049}$ | $Y_{\text{P}}^{\text{BBN}}$    | $0.24707^{+0.00093}_{-0.00091}$ | $H(2.33)$                 | $236.8^{+4.5}_{-4.1}$        |
| $H_0$                              | $67.9^{+5.3}_{-5.0}$         | $10^5 D/\text{H}$              | $2.44^{+0.40}_{-0.37}$          | $D_{\text{M}}(2.33)$      | $5744^{+120}_{-120}$         |
| $\Omega_{\Lambda}$                 | $0.687^{+0.058}_{-0.068}$    | Age/Gyr                        | $13.75^{+0.27}_{-0.30}$         | $f\sigma_8(0.15)$         | $0.458^{+0.058}_{-0.056}$    |
| $\Omega_{\text{m}}$                | $0.313^{+0.068}_{-0.058}$    | $z_*$                          | $1088.9^{+3.4}_{-3.2}$          | $\sigma_8(0.15)$          | $0.750^{+0.025}_{-0.027}$    |
| $\Omega_{\text{m}}h^2$             | $0.1431^{+0.0076}_{-0.0072}$ | $r_*$                          | $144.0^{+1.3}_{-1.3}$           | $f\sigma_8(0.38)$         | $0.476^{+0.043}_{-0.045}$    |
| $\Omega_{\text{m}}h^3$             | $0.0970^{+0.0035}_{-0.0031}$ | $100\theta_*$                  | $1.0394^{+0.0017}_{-0.0016}$    | $\sigma_8(0.38)$          | $0.665^{+0.017}_{-0.018}$    |
| $\sigma_8$                         | $0.812^{+0.032}_{-0.034}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.85^{+0.12}_{-0.12}$         | $f\sigma_8(0.51)$         | $0.474^{+0.036}_{-0.038}$    |
| $S_8$                              | $0.83^{+0.12}_{-0.11}$       | $z_{\text{drag}}$              | $1061.8^{+4.6}_{-4.4}$          | $\sigma_8(0.51)$          | $0.622^{+0.015}_{-0.015}$    |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.454^{+0.064}_{-0.060}$    | $r_{\text{drag}}$              | $146.3^{+1.3}_{-1.3}$           | $f\sigma_8(0.61)$         | $0.469^{+0.030}_{-0.034}$    |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.607^{+0.054}_{-0.054}$    | $k_{\text{D}}$                 | $0.1423^{+0.0024}_{-0.0024}$    | $\sigma_8(0.61)$          | $0.592^{+0.013}_{-0.013}$    |
| $\sigma_8/h^{0.5}$                 | $0.986^{+0.074}_{-0.075}$    | $100\theta_{\text{D}}$         | $0.1595^{+0.0027}_{-0.0024}$    | $f\sigma_8(2.33)$         | $0.2984^{+0.0062}_{-0.0056}$ |
| $r_{\text{drag}}h$                 | $99.3^{+7.8}_{-7.5}$         | $z_{\text{eq}}$                | $3405^{+180}_{-170}$            | $\sigma_8(2.33)$          | $0.3078^{+0.0067}_{-0.0061}$ |
| $\langle d^2 \rangle^{1/2}$        | $2.46^{+0.14}_{-0.15}$       | $k_{\text{eq}}$                | $0.01039^{+0.00056}_{-0.00053}$ | $\chi_{\text{simall}}^2$  | $396.5 (\nu: 1.0)$           |
| $z_{\text{re}}$                    | $< 8.53$                     | $100\theta_{\text{eq}}$        | $0.814^{+0.038}_{-0.037}$       | $\chi_{\text{CamSpec}}^2$ | $1891.4 (\nu: 4.8)$          |
| $10^9 A_{\text{s}}$                | $2.144^{+0.084}_{-0.073}$    | $100\theta_{\text{s,eq}}$      | $0.449^{+0.018}_{-0.018}$       | $\chi_{\text{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_{\text{s}}e^{-2\tau}$      | $1.924^{+0.049}_{-0.046}$    | $H(0.15)$                      | $73.2^{+4.8}_{-4.4}$            | $\chi_{\text{CMB}}^2$     | $2287.9 (\nu: 5.7)$          |
| $D_{40}$                           | $1260^{+60}_{-60}$           | $D_{\text{M}}(0.15)$           | $640^{+45}_{-44}$               |                           |                              |

$$\bar{\chi}_{\text{eff}}^2 = 2298.97; R - 1 = 0.00869$$



## 2.17 base\_CamSpecHM\_TE\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022423 | $0.02242^{+0.00045}_{-0.00046}$ | $D_{810}$             | 2547.3   | $2547^{+50}_{-48}$              | $H(0.51)$          | 90.03    | $90.04^{+0.58}_{-0.58}$      |
| $\Omega_c h^2$              | 0.11784  | $0.1179^{+0.0024}_{-0.0023}$    | $D_{1420}$            | 824.1    | $824^{+23}_{-23}$               | $D_M(0.51)$        | 1968.0   | $1968^{+21}_{-20}$           |
| $100\theta_{MC}$            | 1.04128  | $1.04131^{+0.00091}_{-0.00093}$ | $D_{2000}$            | 233.2    | $233.0^{+8.4}_{-8.3}$           | $H(0.61)$          | 95.58    | $95.59^{+0.51}_{-0.50}$      |
| $\tau$                      | 0.0511   | $0.050^{+0.017}_{-0.017}$       | $n_{s,0.002}$         | 0.9766   | $0.976^{+0.020}_{-0.020}$       | $D_M(0.61)$        | 2291.2   | $2291^{+23}_{-22}$           |
| $\ln(10^{10} A_s)$          | 3.0345   | $3.032^{+0.039}_{-0.039}$       | $Y_P$                 | 0.245416 | $0.24541^{+0.00018}_{-0.00019}$ | $H(2.33)$          | 235.22   | $235.2^{+1.6}_{-1.5}$        |
| $n_s$                       | 0.9766   | $0.976^{+0.020}_{-0.020}$       | $Y_P^{BBN}$           | 0.246743 | $0.24674^{+0.00018}_{-0.00019}$ | $D_M(2.33)$        | 5751.7   | $5751^{+26}_{-25}$           |
| $y_{cal}$                   | 0.99984  | $0.99996^{+0.0048}_{-0.0048}$   | $10^5 D/H$            | 2.576    | $2.577^{+0.086}_{-0.082}$       | $f\sigma_8(0.15)$  | 0.4471   | $0.446^{+0.016}_{-0.016}$    |
| $H_0$                       | 68.28    | $68.3^{+1.0}_{-1.0}$            | Age/Gyr               | 13.772   | $13.771^{+0.059}_{-0.058}$      | $\sigma_8(0.15)$   | 0.7435   | $0.742^{+0.017}_{-0.018}$    |
| $\Omega_\Lambda$            | 0.6977   | $0.698^{+0.013}_{-0.014}$       | $z_*$                 | 1089.66  | $1089.67^{+0.63}_{-0.62}$       | $f\sigma_8(0.38)$  | 0.4673   | $0.467^{+0.014}_{-0.014}$    |
| $\Omega_m$                  | 0.3023   | $0.302^{+0.014}_{-0.013}$       | $r_*$                 | 144.95   | $144.95^{+0.66}_{-0.65}$        | $\sigma_8(0.38)$   | 0.6601   | $0.659^{+0.015}_{-0.016}$    |
| $\Omega_m h^2$              | 0.14091  | $0.1409^{+0.0023}_{-0.0023}$    | $100\theta_*$         | 1.04145  | $1.04149^{+0.00090}_{-0.00092}$ | $f\sigma_8(0.51)$  | 0.4670   | $0.466^{+0.013}_{-0.014}$    |
| $\Omega_m h^3$              | 0.09621  | $0.0962^{+0.0010}_{-0.0010}$    | $D_M(z_*)/\text{Gpc}$ | 13.918   | $13.918^{+0.066}_{-0.064}$      | $\sigma_8(0.51)$   | 0.6181   | $0.617^{+0.014}_{-0.015}$    |
| $\sigma_8$                  | 0.8036   | $0.802^{+0.019}_{-0.020}$       | $z_{drag}$            | 1059.89  | $1059.9^{+1.0}_{-1.1}$          | $f\sigma_8(0.61)$  | 0.4628   | $0.462^{+0.012}_{-0.013}$    |
| $S_8$                       | 0.8066   | $0.805^{+0.032}_{-0.030}$       | $r_{drag}$            | 147.61   | $147.61^{+0.75}_{-0.73}$        | $\sigma_8(0.61)$   | 0.5884   | $0.587^{+0.013}_{-0.014}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4418   | $0.441^{+0.017}_{-0.017}$       | $k_D$                 | 0.14036  | $0.1404^{+0.0010}_{-0.0010}$    | $f\sigma_8(2.33)$  | 0.2971   | $0.2966^{+0.0066}_{-0.0071}$ |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5958   | $0.595^{+0.018}_{-0.018}$       | $100\theta_D$         | 0.16081  | $0.16082^{+0.00062}_{-0.00060}$ | $\sigma_8(2.33)$   | 0.3067   | $0.3062^{+0.0068}_{-0.0073}$ |
| $\sigma_8/h^{0.5}$          | 0.9725   | $0.971^{+0.026}_{-0.027}$       | $z_{eq}$              | 3352     | $3352^{+56}_{-55}$              | $\chi^2_{small}$   | 395.71   | $396.8 (\nu: 1.2)$           |
| $r_{drag} h$                | 100.78   | $100.8^{+1.7}_{-1.8}$           | $k_{eq}$              | 0.010230 | $0.01023^{+0.00017}_{-0.00017}$ | $\chi^2_{CamSpec}$ | 2576.1   | $2580.4 (\nu: 4.2)$          |
| $\langle d^2 \rangle^{1/2}$ | 2.388    | $2.387^{+0.064}_{-0.065}$       | $100\theta_{eq}$      | 0.8228   | $0.823^{+0.010}_{-0.010}$       | $\chi^2_{6DF}$     | 0.004    | $0.040 (\nu: 0.0)$           |
| $z_{re}$                    | 7.31     | $7.1^{+1.7}_{-1.8}$             | $100\theta_{s,eq}$    | 0.4543   | $0.4543^{+0.0053}_{-0.0053}$    | $\chi^2_{MGS}$     | 1.89     | $1.96 (\nu: 0.2)$            |
| $10^9 A_s$                  | 2.079    | $2.074^{+0.079}_{-0.085}$       | $H(0.15)$             | 73.46    | $73.47^{+0.89}_{-0.90}$         | $\chi^2_{DR12BAO}$ | 3.37     | $3.93 (\nu: 0.3)$            |
| $10^9 A_s e^{-2\tau}$       | 1.8770   | $1.877^{+0.034}_{-0.033}$       | $D_M(0.15)$           | 635.6    | $635.5^{+8.8}_{-8.5}$           | $\chi^2_{prior}$   | 10.03    | $11.0 (\nu: 1.0)$            |
| $D_{40}$                    | 1203.3   | $1206^{+47}_{-47}$              | $H(0.38)$             | 83.41    | $83.42^{+0.69}_{-0.69}$         | $\chi^2_{BAO}$     | 5.27     | $5.93 (\nu: 0.5)$            |
| $D_{220}$                   | 5710     | $5715^{+110}_{-120}$            | $D_M(0.38)$           | 1518.1   | $1518^{+18}_{-17}$              | $\chi^2_{CMB}$     | 2971.9   | $2977.2 (\nu: 5.3)$          |

Best-fit  $\chi^2_{eff} = 2987.15$ ;  $\bar{\chi}^2_{eff} = 2994.10$ ;  $R - 1 = 0.00951$

$\chi^2_{eff}$ : BAO - 6DF: 0.00 MGS: 1.89 DR12BAO: 3.37 CMB - small\_100x143.offlike5\_EE\_Aplanck\_B: 395.71 CamSpec like\_10.7HM\_1400\_unified: 2576.15



## 2.18 base\_CamSpecHM\_TE\_lowE\_BAO\_post\_lensing

| Parameter                          | 95% limits                      | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.02245^{+0.00044}_{-0.00045}$ | $D_{1420}$                     | $827^{+20}_{-19}$               | $H(0.61)$                 | $95.58^{+0.50}_{-0.49}$      |
| $\Omega_{\text{c}}h^2$             | $0.1181^{+0.0022}_{-0.0022}$    | $D_{2000}$                     | $234.1^{+7.4}_{-7.0}$           | $D_{\text{M}}(0.61)$      | $2292^{+21}_{-22}$           |
| $100\theta_{\text{MC}}$            | $1.04128^{+0.00092}_{-0.00092}$ | $n_{\text{s},0.002}$           | $0.976^{+0.019}_{-0.020}$       | $H(2.33)$                 | $235.4^{+1.4}_{-1.4}$        |
| $\tau$                             | $0.052^{+0.014}_{-0.015}$       | $Y_{\text{P}}$                 | $0.24542^{+0.00017}_{-0.00018}$ | $D_{\text{M}}(2.33)$      | $5751^{+24}_{-25}$           |
| $\ln(10^{10}A_{\text{s}})$         | $3.041^{+0.030}_{-0.030}$       | $Y_{\text{P}}^{\text{BBN}}$    | $0.24675^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.15)$         | $0.450^{+0.012}_{-0.012}$    |
| $n_{\text{s}}$                     | $0.976^{+0.019}_{-0.020}$       | $10^5\text{D}/\text{H}$        | $2.572^{+0.084}_{-0.079}$       | $\sigma_8(0.15)$          | $0.746^{+0.012}_{-0.012}$    |
| $y_{\text{cal}}$                   | $1.0002^{+0.0048}_{-0.0049}$    | Age/Gyr                        | $13.771^{+0.056}_{-0.056}$      | $f\sigma_8(0.38)$         | $0.470^{+0.010}_{-0.010}$    |
| $H_0$                              | $68.21^{+0.99}_{-0.98}$         | $z_*$                          | $1089.66^{+0.64}_{-0.61}$       | $\sigma_8(0.38)$          | $0.662^{+0.011}_{-0.011}$    |
| $\Omega_{\Lambda}$                 | $0.696^{+0.012}_{-0.013}$       | $r_*$                          | $144.87^{+0.58}_{-0.58}$        | $f\sigma_8(0.51)$         | $0.4692^{+0.0091}_{-0.0093}$ |
| $\Omega_{\text{m}}$                | $0.304^{+0.013}_{-0.012}$       | $100\theta_*$                  | $1.04146^{+0.00090}_{-0.00091}$ | $\sigma_8(0.51)$          | $0.620^{+0.010}_{-0.010}$    |
| $\Omega_{\text{m}}h^2$             | $0.1412^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.910^{+0.058}_{-0.057}$      | $f\sigma_8(0.61)$         | $0.4649^{+0.0085}_{-0.0088}$ |
| $\Omega_{\text{m}}h^3$             | $0.09631^{+0.00094}_{-0.00096}$ | $z_{\text{drag}}$              | $1059.98^{+0.99}_{-1.0}$        | $\sigma_8(0.61)$          | $0.5904^{+0.0097}_{-0.010}$  |
| $\sigma_8$                         | $0.807^{+0.013}_{-0.014}$       | $r_{\text{drag}}$              | $147.51^{+0.66}_{-0.64}$        | $f\sigma_8(2.33)$         | $0.2980^{+0.0051}_{-0.0051}$ |
| $S_8$                              | $0.811^{+0.023}_{-0.023}$       | $k_{\text{D}}$                 | $0.14048^{+0.00091}_{-0.00090}$ | $\sigma_8(2.33)$          | $0.3076^{+0.0054}_{-0.0055}$ |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.444^{+0.013}_{-0.013}$       | $100\theta_{\text{D}}$         | $0.16077^{+0.00059}_{-0.00056}$ | $\chi^2_{\text{lensing}}$ | $9.6 (\nu: 0.6)$             |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.599^{+0.012}_{-0.013}$       | $z_{\text{eq}}$                | $3359^{+51}_{-50}$              | $\chi^2_{\text{simall}}$  | $396.6 (\nu: 0.7)$           |
| $\sigma_8/h^{0.5}$                 | $0.977^{+0.018}_{-0.019}$       | $k_{\text{eq}}$                | $0.01025^{+0.00016}_{-0.00015}$ | $\chi^2_{\text{CamSpec}}$ | $2580.2 (\nu: 3.8)$          |
| $r_{\text{drag}}h$                 | $100.6^{+1.7}_{-1.7}$           | $100\theta_{\text{eq}}$        | $0.8217^{+0.0094}_{-0.0094}$    | $\chi^2_{6\text{DF}}$     | $0.032 (\nu: 0.0)$           |
| $\langle d^2 \rangle^{1/2}$        | $2.399^{+0.057}_{-0.055}$       | $100\theta_{\text{s,eq}}$      | $0.4537^{+0.0049}_{-0.0048}$    | $\chi^2_{\text{MGS}}$     | $1.85 (\nu: 0.1)$            |
| $z_{\text{re}}$                    | $7.4^{+1.5}_{-1.5}$             | $H(0.15)$                      | $73.41^{+0.87}_{-0.84}$         | $\chi^2_{\text{DR12BAO}}$ | $3.91 (\nu: 0.3)$            |
| $10^9A_{\text{s}}$                 | $2.092^{+0.063}_{-0.063}$       | $D_{\text{M}}(0.15)$           | $636.1^{+8.3}_{-8.3}$           | $\chi^2_{\text{prior}}$   | $11.0 (\nu: 1.0)$            |
| $10^9A_{\text{s}}e^{-2\tau}$       | $1.884^{+0.026}_{-0.026}$       | $H(0.38)$                      | $83.39^{+0.68}_{-0.65}$         | $\chi^2_{\text{CMB}}$     | $2986.4 (\nu: 5.3)$          |
| $D_{40}$                           | $1210^{+47}_{-47}$              | $D_{\text{M}}(0.38)$           | $1519^{+17}_{-17}$              | $\chi^2_{\text{BAO}}$     | $5.79 (\nu: 0.3)$            |
| $D_{220}$                          | $5731^{+110}_{-110}$            | $H(0.51)$                      | $90.02^{+0.57}_{-0.57}$         |                           |                              |
| $D_{810}$                          | $2556^{+41}_{-40}$              | $D_{\text{M}}(0.51)$           | $1969^{+20}_{-20}$              |                           |                              |

$\bar{\chi}^2_{\text{eff}} = 3003.21$ ;  $R - 1 = 0.01219$



## 2.19 base\_CamSpecHM\_TE\_lowE\_BAO\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter             | 95% limits                      | Parameter          | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------|---------------------------------|--------------------|------------------------------|
| $\Omega_b h^2$              | $0.02243^{+0.00045}_{-0.00046}$ | $D_{810}$             | $2549^{+49}_{-49}$              | $H(0.51)$          | $90.06^{+0.58}_{-0.57}$      |
| $\Omega_c h^2$              | $0.1178^{+0.0024}_{-0.0023}$    | $D_{1420}$            | $824^{+23}_{-23}$               | $D_M(0.51)$        | $1967^{+21}_{-21}$           |
| $100\theta_{MC}$            | $1.04131^{+0.00091}_{-0.00092}$ | $D_{2000}$            | $233.4^{+8.3}_{-8.2}$           | $H(0.61)$          | $95.60^{+0.51}_{-0.50}$      |
| $\tau$                      | $0.0528^{+0.012}_{-0.0096}$     | $n_{s,0.002}$         | $0.976^{+0.020}_{-0.020}$       | $D_M(0.61)$        | $2291^{+23}_{-22}$           |
| $\ln(10^{10} A_s)$          | $3.038^{+0.031}_{-0.029}$       | $Y_P$                 | $0.24542^{+0.00018}_{-0.00019}$ | $H(2.33)$          | $235.2^{+1.6}_{-1.6}$        |
| $n_s$                       | $0.976^{+0.020}_{-0.020}$       | $Y_P^{BBN}$           | $0.24674^{+0.00018}_{-0.00019}$ | $D_M(2.33)$        | $5751^{+25}_{-25}$           |
| $y_{cal}$                   | $0.99998^{+0.0047}_{-0.0048}$   | $10^5 D/H$            | $2.575^{+0.086}_{-0.081}$       | $f\sigma_8(0.15)$  | $0.448^{+0.016}_{-0.015}$    |
| $H_0$                       | $68.3^{+1.0}_{-1.0}$            | Age/Gyr               | $13.770^{+0.059}_{-0.058}$      | $\sigma_8(0.15)$   | $0.745^{+0.015}_{-0.014}$    |
| $\Omega_\Lambda$            | $0.698^{+0.013}_{-0.014}$       | $z_*$                 | $1089.66^{+0.63}_{-0.62}$       | $f\sigma_8(0.38)$  | $0.468^{+0.014}_{-0.013}$    |
| $\Omega_m$                  | $0.302^{+0.014}_{-0.013}$       | $r_*$                 | $144.95^{+0.67}_{-0.65}$        | $\sigma_8(0.38)$   | $0.661^{+0.013}_{-0.012}$    |
| $\Omega_m h^2$              | $0.1409^{+0.0024}_{-0.0023}$    | $100\theta_*$         | $1.04149^{+0.00091}_{-0.00091}$ | $f\sigma_8(0.51)$  | $0.468^{+0.012}_{-0.012}$    |
| $\Omega_m h^3$              | $0.0962^{+0.0010}_{-0.0011}$    | $D_M(z_*)/\text{Gpc}$ | $13.918^{+0.066}_{-0.064}$      | $\sigma_8(0.51)$   | $0.619^{+0.012}_{-0.011}$    |
| $\sigma_8$                  | $0.805^{+0.017}_{-0.016}$       | $z_{drag}$            | $1059.9^{+1.0}_{-1.1}$          | $f\sigma_8(0.61)$  | $0.464^{+0.011}_{-0.011}$    |
| $S_8$                       | $0.808^{+0.030}_{-0.029}$       | $r_{drag}$            | $147.60^{+0.76}_{-0.73}$        | $\sigma_8(0.61)$   | $0.590^{+0.012}_{-0.011}$    |
| $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.017}_{-0.016}$       | $k_D$                 | $0.14037^{+0.00099}_{-0.0010}$  | $f\sigma_8(2.33)$  | $0.2976^{+0.0059}_{-0.0053}$ |
| $\sigma_8 \Omega_m^{0.25}$  | $0.597^{+0.017}_{-0.016}$       | $100\theta_D$         | $0.16081^{+0.00062}_{-0.00059}$ | $\sigma_8(2.33)$   | $0.3073^{+0.0062}_{-0.0055}$ |
| $\sigma_8/h^{0.5}$          | $0.974^{+0.024}_{-0.023}$       | $z_{eq}$              | $3352^{+57}_{-56}$              | $\chi_{simall}^2$  | $396.4 (\nu: 0.5)$           |
| $r_{drag} h$                | $100.8^{+1.7}_{-1.8}$           | $k_{eq}$              | $0.01023^{+0.00017}_{-0.00017}$ | $\chi_{CamSpec}^2$ | $2580.4 (\nu: 4.2)$          |
| $\langle d^2 \rangle^{1/2}$ | $2.393^{+0.061}_{-0.058}$       | $100\theta_{eq}$      | $0.823^{+0.010}_{-0.010}$       | $\chi_{6DF}^2$     | $0.040 (\nu: 0.0)$           |
| $z_{re}$                    | $< 8.55$                        | $100\theta_{s,eq}$    | $0.4544^{+0.0053}_{-0.0054}$    | $\chi_{MGS}^2$     | $1.98 (\nu: 0.2)$            |
| $10^9 A_s$                  | $2.087^{+0.065}_{-0.060}$       | $H(0.15)$             | $73.49^{+0.89}_{-0.90}$         | $\chi_{DR12BAO}^2$ | $3.92 (\nu: 0.3)$            |
| $10^9 A_s e^{-2\tau}$       | $1.878^{+0.034}_{-0.033}$       | $D_M(0.15)$           | $635.4^{+8.8}_{-8.5}$           | $\chi_{prior}^2$   | $11.0 (\nu: 1.0)$            |
| $D_{40}$                    | $1206^{+47}_{-47}$              | $H(0.38)$             | $83.43^{+0.69}_{-0.69}$         | $\chi_{BAO}^2$     | $5.94 (\nu: 0.5)$            |
| $D_{220}$                   | $5716^{+110}_{-120}$            | $D_M(0.38)$           | $1518^{+18}_{-17}$              | $\chi_{CMB}^2$     | $2976.8 (\nu: 4.8)$          |

$$\bar{\chi}_{\text{eff}}^2 = 2993.70; R - 1 = 0.01568$$



## 2.20 base\_CamSpecHM\_TE\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                   | 95% limits                      | Parameter             | 95% limits                      | Parameter          | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------|---------------------------------|--------------------|------------------------------|
| $\Omega_b h^2$              | $0.02245^{+0.00044}_{-0.00044}$ | $D_{1420}$            | $827^{+20}_{-19}$               | $H(0.61)$          | $95.59^{+0.50}_{-0.48}$      |
| $\Omega_c h^2$              | $0.1180^{+0.0022}_{-0.0022}$    | $D_{2000}$            | $234.1^{+7.3}_{-7.1}$           | $D_M(0.61)$        | $2292^{+21}_{-22}$           |
| $100\theta_{MC}$            | $1.04128^{+0.00092}_{-0.00090}$ | $n_{s,0.002}$         | $0.976^{+0.019}_{-0.020}$       | $H(2.33)$          | $235.4^{+1.4}_{-1.4}$        |
| $\tau$                      | $0.054^{+0.012}_{-0.010}$       | $Y_P$                 | $0.24542^{+0.00017}_{-0.00018}$ | $D_M(2.33)$        | $5751^{+24}_{-25}$           |
| $\ln(10^{10} A_s)$          | $3.043^{+0.026}_{-0.024}$       | $Y_P^{BBN}$           | $0.24675^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.15)$  | $0.450^{+0.012}_{-0.012}$    |
| $n_s$                       | $0.976^{+0.019}_{-0.020}$       | $10^5 D/H$            | $2.572^{+0.083}_{-0.078}$       | $\sigma_8(0.15)$   | $0.747^{+0.011}_{-0.011}$    |
| $y_{cal}$                   | $1.0002^{+0.0047}_{-0.0048}$    | Age/Gyr               | $13.770^{+0.055}_{-0.056}$      | $f\sigma_8(0.38)$  | $0.4700^{+0.0099}_{-0.0098}$ |
| $H_0$                       | $68.24^{+0.99}_{-0.96}$         | $z_*$                 | $1089.65^{+0.64}_{-0.61}$       | $\sigma_8(0.38)$   | $0.663^{+0.010}_{-0.0095}$   |
| $\Omega_\Lambda$            | $0.697^{+0.012}_{-0.013}$       | $r_*$                 | $144.88^{+0.58}_{-0.57}$        | $f\sigma_8(0.51)$  | $0.4696^{+0.0089}_{-0.0088}$ |
| $\Omega_m$                  | $0.303^{+0.013}_{-0.012}$       | $100\theta_*$         | $1.04146^{+0.00092}_{-0.00090}$ | $\sigma_8(0.51)$   | $0.6210^{+0.0095}_{-0.0089}$ |
| $\Omega_m h^2$              | $0.1411^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$ | $13.911^{+0.057}_{-0.057}$      | $f\sigma_8(0.61)$  | $0.4653^{+0.0083}_{-0.0082}$ |
| $\Omega_m h^3$              | $0.09630^{+0.00094}_{-0.00095}$ | $z_{drag}$            | $1059.97^{+0.99}_{-1.0}$        | $\sigma_8(0.61)$   | $0.5912^{+0.0092}_{-0.0085}$ |
| $\sigma_8$                  | $0.808^{+0.012}_{-0.012}$       | $r_{drag}$            | $147.53^{+0.66}_{-0.63}$        | $f\sigma_8(2.33)$  | $0.2984^{+0.0048}_{-0.0043}$ |
| $S_8$                       | $0.812^{+0.023}_{-0.023}$       | $k_D$                 | $0.14047^{+0.00087}_{-0.00090}$ | $\sigma_8(2.33)$   | $0.3080^{+0.0051}_{-0.0047}$ |
| $\sigma_8 \Omega_m^{0.5}$   | $0.445^{+0.013}_{-0.013}$       | $100\theta_D$         | $0.16077^{+0.00059}_{-0.00056}$ | $\chi^2_{lensing}$ | $9.5 (\nu: 0.5)$             |
| $\sigma_8 \Omega_m^{0.25}$  | $0.599^{+0.012}_{-0.012}$       | $z_{eq}$              | $3357^{+50}_{-50}$              | $\chi^2_{simall}$  | $396.5 (\nu: 0.6)$           |
| $\sigma_8/h^{0.5}$          | $0.978^{+0.017}_{-0.017}$       | $k_{eq}$              | $0.01025^{+0.00015}_{-0.00015}$ | $\chi^2_{CamSpec}$ | $2580.1 (\nu: 3.6)$          |
| $r_{drag} h$                | $100.7^{+1.6}_{-1.6}$           | $100\theta_{eq}$      | $0.8220^{+0.0093}_{-0.0094}$    | $\chi^2_{6DF}$     | $0.032 (\nu: 0.0)$           |
| $\langle d^2 \rangle^{1/2}$ | $2.401^{+0.056}_{-0.052}$       | $100\theta_{s,eq}$    | $0.4539^{+0.0048}_{-0.0048}$    | $\chi^2_{MGS}$     | $1.88 (\nu: 0.1)$            |
| $z_{re}$                    | $< 8.61$                        | $H(0.15)$             | $73.43^{+0.86}_{-0.84}$         | $\chi^2_{DR12BAO}$ | $3.88 (\nu: 0.3)$            |
| $10^9 A_s$                  | $2.098^{+0.055}_{-0.050}$       | $D_M(0.15)$           | $635.9^{+8.2}_{-8.3}$           | $\chi^2_{prior}$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_s e^{-2\tau}$       | $1.884^{+0.026}_{-0.026}$       | $H(0.38)$             | $83.40^{+0.68}_{-0.64}$         | $\chi^2_{CMB}$     | $2986.1 (\nu: 4.7)$          |
| $D_{40}$                    | $1209^{+47}_{-47}$              | $D_M(0.38)$           | $1519^{+17}_{-17}$              | $\chi^2_{BAO}$     | $5.79 (\nu: 0.3)$            |
| $D_{220}$                   | $5730^{+110}_{-110}$            | $H(0.51)$             | $90.03^{+0.57}_{-0.54}$         |                    |                              |
| $D_{810}$                   | $2555^{+41}_{-40}$              | $D_M(0.51)$           | $1969^{+20}_{-20}$              |                    |                              |

$\bar{\chi}^2_{eff} = 3002.87; R - 1 = 0.01685$



## 2.21 base\_CamSpecHM\_EE\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                   | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02359  | $0.0235^{+0.0013}_{-0.0012}$ | $D_{810}$             | 2607     | $2605^{+65}_{-65}$              | $H(0.51)$          | 90.47    | $90.5^{+1.2}_{-1.1}$         |
| $\Omega_c h^2$              | 0.11770  | $0.1178^{+0.0028}_{-0.0028}$ | $D_{1420}$            | 845.0    | $844^{+28}_{-28}$               | $D_M(0.51)$        | 1957.7   | $1958^{+36}_{-35}$           |
| $100\theta_{MC}$            | 1.03937  | $1.0395^{+0.0016}_{-0.0015}$ | $D_{2000}$            | 240.8    | $240^{+10}_{-10}$               | $H(0.61)$          | 96.03    | $96.0^{+1.1}_{-1.0}$         |
| $\tau$                      | 0.0511   | $0.051^{+0.016}_{-0.016}$    | $n_{s,0.002}$         | 0.9701   | $0.970^{+0.018}_{-0.018}$       | $D_M(0.61)$        | 2279.5   | $2280^{+39}_{-39}$           |
| $\ln(10^{10} A_s)$          | 3.0603   | $3.059^{+0.040}_{-0.042}$    | $Y_P$                 | 0.245904 | $0.24587^{+0.00049}_{-0.00048}$ | $H(2.33)$          | 236.12   | $236.1^{+1.9}_{-2.0}$        |
| $n_s$                       | 0.9701   | $0.970^{+0.018}_{-0.018}$    | $Y_P^{BBN}$           | 0.247232 | $0.24720^{+0.00049}_{-0.00048}$ | $D_M(2.33)$        | 5726     | $5727^{+55}_{-58}$           |
| $y_{cal}$                   | 1.00012  | $1.0001^{+0.0048}_{-0.0048}$ | $10^5 D/H$            | 2.373    | $2.38^{+0.21}_{-0.20}$          | $f\sigma_8(0.15)$  | 0.4469   | $0.447^{+0.019}_{-0.019}$    |
| $H_0$                       | 68.66    | $68.6^{+1.6}_{-1.6}$         | Age/Gyr               | 13.710   | $13.71^{+0.13}_{-0.14}$         | $\sigma_8(0.15)$   | 0.7447   | $0.745^{+0.017}_{-0.017}$    |
| $\Omega_\Lambda$            | 0.6989   | $0.699^{+0.017}_{-0.018}$    | $z_*$                 | 1088.26  | $1088.3^{+1.5}_{-1.5}$          | $f\sigma_8(0.38)$  | 0.4675   | $0.468^{+0.016}_{-0.016}$    |
| $\Omega_m$                  | 0.3011   | $0.301^{+0.018}_{-0.017}$    | $r_*$                 | 144.09   | $144.1^{+1.0}_{-1.0}$           | $\sigma_8(0.38)$   | 0.6613   | $0.661^{+0.015}_{-0.015}$    |
| $\Omega_m h^2$              | 0.14194  | $0.1419^{+0.0027}_{-0.0028}$ | $100\theta_*$         | 1.03943  | $1.0395^{+0.0016}_{-0.0015}$    | $f\sigma_8(0.51)$  | 0.4673   | $0.467^{+0.014}_{-0.015}$    |
| $\Omega_m h^3$              | 0.09746  | $0.0974^{+0.0024}_{-0.0022}$ | $D_M(z_*)/\text{Gpc}$ | 13.862   | $13.86^{+0.10}_{-0.099}$        | $\sigma_8(0.51)$   | 0.6193   | $0.619^{+0.014}_{-0.014}$    |
| $\sigma_8$                  | 0.8048   | $0.805^{+0.020}_{-0.019}$    | $z_{drag}$            | 1062.57  | $1062.4^{+2.8}_{-2.7}$          | $f\sigma_8(0.61)$  | 0.4632   | $0.463^{+0.013}_{-0.013}$    |
| $S_8$                       | 0.8062   | $0.807^{+0.036}_{-0.036}$    | $r_{drag}$            | 146.35   | $146.4^{+1.3}_{-1.4}$           | $\sigma_8(0.61)$   | 0.5896   | $0.590^{+0.013}_{-0.013}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4416   | $0.442^{+0.020}_{-0.020}$    | $k_D$                 | 0.14253  | $0.1424^{+0.0022}_{-0.0022}$    | $f\sigma_8(2.33)$  | 0.2977   | $0.2977^{+0.0065}_{-0.0065}$ |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5961   | $0.596^{+0.020}_{-0.020}$    | $100\theta_D$         | 0.15901  | $0.1591^{+0.0016}_{-0.0015}$    | $\sigma_8(2.33)$   | 0.3074   | $0.3073^{+0.0066}_{-0.0069}$ |
| $\sigma_8/h^{0.5}$          | 0.9712   | $0.972^{+0.029}_{-0.029}$    | $z_{eq}$              | 3377     | $3377^{+64}_{-66}$              | $\chi^2_{small}$   | 395.59   | $396.7 (\nu: 1.0)$           |
| $r_{drag} h$                | 100.49   | $100.5^{+2.2}_{-2.2}$        | $k_{eq}$              | 0.010306 | $0.01031^{+0.00020}_{-0.00020}$ | $\chi^2_{CamSpec}$ | 1886.67  | $1890.8 (\nu: 4.1)$          |
| $\langle d^2 \rangle^{1/2}$ | 2.427    | $2.427^{+0.067}_{-0.069}$    | $100\theta_{eq}$      | 0.8201   | $0.820^{+0.012}_{-0.011}$       | $\chi^2_{6DF}$     | 0.000    | $0.053 (\nu: 0.0)$           |
| $z_{re}$                    | 7.07     | $7.1^{+1.6}_{-1.6}$          | $100\theta_{s,eq}$    | 0.4520   | $0.4520^{+0.0062}_{-0.0059}$    | $\chi^2_{MGS}$     | 1.68     | $1.75 (\nu: 0.2)$            |
| $10^9 A_s$                  | 2.133    | $2.132^{+0.087}_{-0.087}$    | $H(0.15)$             | 73.86    | $73.8^{+1.5}_{-1.5}$            | $\chi^2_{DR12BAO}$ | 3.85     | $4.6 (\nu: 1.0)$             |
| $10^9 A_s e^{-2\tau}$       | 1.9260   | $1.924^{+0.046}_{-0.047}$    | $D_M(0.15)$           | 632.1    | $632^{+14}_{-14}$               | $\chi^2_{prior}$   | 10.03    | $11.0 (\nu: 0.9)$            |
| $D_{40}$                    | 1260     | $1259^{+58}_{-60}$           | $H(0.38)$             | 83.83    | $83.8^{+1.3}_{-1.2}$            | $\chi^2_{BAO}$     | 5.52     | $6.4 (\nu: 0.8)$             |
| $D_{220}$                   | 6001     | $5991^{+260}_{-260}$         | $D_M(0.38)$           | 1510.0   | $1511^{+29}_{-29}$              | $\chi^2_{CMB}$     | 2282.3   | $2287.4 (\nu: 5.1)$          |

Best-fit  $\chi^2_{eff} = 2297.82$ ;  $\bar{\chi}^2_{eff} = 2304.89$ ;  $R - 1 = 0.00669$

$\chi^2_{eff}$ : BAO - 6DF: 0.00 MGS: 1.68 DR12BAO: 3.85 CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.59 CamSpec like\_10.7HM\_1400\_unified: 1886.67



## 2.22 base\_CamSpecHM\_EE\_lowE\_BAO\_post\_lensing

| Parameter                          | 95% limits                   | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.0233^{+0.0011}_{-0.0010}$ | $D_{1420}$                     | $835^{+22}_{-22}$               | $H(0.61)$                 | $95.9^{+1.0}_{-0.98}$        |
| $\Omega_{\text{c}}h^2$             | $0.1172^{+0.0026}_{-0.0026}$ | $D_{2000}$                     | $237.0^{+8.1}_{-8.0}$           | $D_{\text{M}}(0.61)$      | $2282^{+38}_{-39}$           |
| $100\theta_{\text{MC}}$            | $1.0395^{+0.0016}_{-0.0015}$ | $n_{\text{s},0.002}$           | $0.969^{+0.018}_{-0.018}$       | $H(2.33)$                 | $235.5^{+1.5}_{-1.6}$        |
| $\tau$                             | $0.049^{+0.014}_{-0.017}$    | $Y_{\text{P}}$                 | $0.24576^{+0.00040}_{-0.00042}$ | $D_{\text{M}}(2.33)$      | $5737^{+52}_{-52}$           |
| $\ln(10^{10}A_{\text{s}})$         | $3.045^{+0.029}_{-0.032}$    | $Y_{\text{P}}^{\text{BBN}}$    | $0.24708^{+0.00040}_{-0.00042}$ | $f\sigma_8(0.15)$         | $0.442^{+0.017}_{-0.017}$    |
| $n_{\text{s}}$                     | $0.969^{+0.018}_{-0.018}$    | $10^5\text{D}/\text{H}$        | $2.43^{+0.18}_{-0.18}$          | $\sigma_8(0.15)$          | $0.739^{+0.013}_{-0.014}$    |
| $y_{\text{cal}}$                   | $0.9998^{+0.0047}_{-0.0046}$ | Age/Gyr                        | $13.74^{+0.12}_{-0.12}$         | $f\sigma_8(0.38)$         | $0.463^{+0.014}_{-0.014}$    |
| $H_0$                              | $68.6^{+1.6}_{-1.6}$         | $z_*$                          | $1088.6^{+1.4}_{-1.3}$          | $\sigma_8(0.38)$          | $0.656^{+0.011}_{-0.012}$    |
| $\Omega_{\Lambda}$                 | $0.700^{+0.017}_{-0.017}$    | $r_*$                          | $144.48^{+0.75}_{-0.76}$        | $f\sigma_8(0.51)$         | $0.463^{+0.012}_{-0.012}$    |
| $\Omega_{\text{m}}$                | $0.300^{+0.017}_{-0.017}$    | $100\theta_*$                  | $1.0396^{+0.0016}_{-0.0015}$    | $\sigma_8(0.51)$          | $0.614^{+0.010}_{-0.011}$    |
| $\Omega_{\text{m}}h^2$             | $0.1411^{+0.0023}_{-0.0023}$ | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.897^{+0.077}_{-0.077}$      | $f\sigma_8(0.61)$         | $0.459^{+0.011}_{-0.011}$    |
| $\Omega_{\text{m}}h^3$             | $0.0968^{+0.0020}_{-0.0019}$ | $z_{\text{drag}}$              | $1061.7^{+2.3}_{-2.2}$          | $\sigma_8(0.61)$          | $0.5849^{+0.0099}_{-0.011}$  |
| $\sigma_8$                         | $0.798^{+0.015}_{-0.015}$    | $r_{\text{drag}}$              | $146.9^{+1.0}_{-1.0}$           | $f\sigma_8(2.33)$         | $0.2954^{+0.0049}_{-0.0054}$ |
| $S_8$                              | $0.798^{+0.033}_{-0.033}$    | $k_{\text{D}}$                 | $0.1417^{+0.0017}_{-0.0017}$    | $\sigma_8(2.33)$          | $0.3051^{+0.0052}_{-0.0057}$ |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.437^{+0.018}_{-0.018}$    | $100\theta_{\text{D}}$         | $0.1595^{+0.0013}_{-0.0013}$    | $\chi^2_{\text{lensing}}$ | $9.3 (\nu: 1.0)$             |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.590^{+0.017}_{-0.017}$    | $z_{\text{eq}}$                | $3356^{+54}_{-54}$              | $\chi^2_{\text{simall}}$  | $396.7 (\nu: 0.9)$           |
| $\sigma_8/h^{0.5}$                 | $0.963^{+0.025}_{-0.025}$    | $k_{\text{eq}}$                | $0.01024^{+0.00017}_{-0.00017}$ | $\chi^2_{\text{CamSpec}}$ | $1890.9 (\nu: 3.7)$          |
| $r_{\text{drag}}h$                 | $100.8^{+2.2}_{-2.1}$        | $100\theta_{\text{eq}}$        | $0.823^{+0.010}_{-0.011}$       | $\chi^2_{6\text{DF}}$     | $0.052 (\nu: 0.0)$           |
| $\langle d^2 \rangle^{1/2}$        | $2.408^{+0.058}_{-0.057}$    | $100\theta_{\text{s,eq}}$      | $0.4538^{+0.0052}_{-0.0052}$    | $\chi^2_{\text{MGS}}$     | $1.93 (\nu: 0.2)$            |
| $z_{\text{re}}$                    | $6.8^{+1.6}_{-1.7}$          | $H(0.15)$                      | $73.8^{+1.5}_{-1.4}$            | $\chi^2_{\text{DR12BAO}}$ | $4.3 (\nu: 0.6)$             |
| $10^9A_{\text{s}}$                 | $2.101^{+0.063}_{-0.067}$    | $D_{\text{M}}(0.15)$           | $633^{+14}_{-14}$               | $\chi^2_{\text{prior}}$   | $11.0 (\nu: 1.0)$            |
| $10^9A_{\text{s}}e^{-2\tau}$       | $1.906^{+0.034}_{-0.032}$    | $H(0.38)$                      | $83.7^{+1.3}_{-1.2}$            | $\chi^2_{\text{CMB}}$     | $2296.9 (\nu: 5.2)$          |
| $D_{40}$                           | $1249^{+56}_{-54}$           | $D_{\text{M}}(0.38)$           | $1512^{+29}_{-29}$              | $\chi^2_{\text{BAO}}$     | $6.3 (\nu: 0.7)$             |
| $D_{220}$                          | $5930^{+220}_{-210}$         | $H(0.51)$                      | $90.3^{+1.1}_{-1.1}$            |                           |                              |
| $D_{810}$                          | $2582^{+50}_{-49}$           | $D_{\text{M}}(0.51)$           | $1960^{+35}_{-35}$              |                           |                              |

$\bar{\chi}^2_{\text{eff}} = 2314.19; R - 1 = 0.00959$



## 2.23 base\_CamSpecHM\_EE\_lowE\_BAO\_post\_zre6p5

| Parameter  | 95% limits                   | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|--|------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$                                 | $0.0235^{+0.0013}_{-0.0012}$ | $D_{810}$                      | $2603^{+65}_{-64}$              | $H(0.51)$                 | $90.4^{+1.2}_{-1.1}$         |
| $\Omega_{\text{c}}h^2$                                 | $0.1177^{+0.0028}_{-0.0028}$ | $D_{1420}$                     | $843^{+28}_{-28}$               | $D_{\text{M}}(0.51)$      | $1959^{+35}_{-35}$           |
| $100\theta_{\text{MC}}$                                | $1.0395^{+0.0015}_{-0.0015}$ | $D_{2000}$                     | $240^{+10}_{-10}$               | $H(0.61)$                 | $96.0^{+1.1}_{-1.0}$         |
| $\tau$   | $0.0543^{+0.012}_{-0.0095}$  | $n_{\text{s},0.002}$           | $0.970^{+0.018}_{-0.018}$       | $D_{\text{M}}(0.61)$      | $2281^{+39}_{-39}$           |
| $\ln(10^{10}A_{\text{s}})$                             | $3.065^{+0.036}_{-0.033}$    | $Y_{\text{P}}$                 | $0.24586^{+0.00049}_{-0.00048}$ | $H(2.33)$                 | $236.1^{+1.9}_{-2.0}$        |
| $n_{\text{s}}$   | $0.970^{+0.018}_{-0.018}$    | $Y_{\text{P}}^{\text{BBN}}$    | $0.24719^{+0.00049}_{-0.00049}$ | $D_{\text{M}}(2.33)$      | $5727^{+55}_{-58}$           |
| $y_{\text{cal}}$                                       | $1.0001^{+0.0047}_{-0.0048}$ | $10^5\text{D}/\text{H}$        | $2.39^{+0.21}_{-0.20}$          | $f\sigma_8(0.15)$         | $0.449^{+0.018}_{-0.018}$    |
| $H_0$  | $68.6^{+1.6}_{-1.6}$         | Age/Gyr                        | $13.71^{+0.13}_{-0.14}$         | $\sigma_8(0.15)$          | $0.747^{+0.016}_{-0.015}$    |
| $\Omega_{\Lambda}$                                     | $0.699^{+0.017}_{-0.018}$    | $z_*$                          | $1088.4^{+1.5}_{-1.5}$          | $f\sigma_8(0.38)$         | $0.469^{+0.015}_{-0.015}$    |
| $\Omega_{\text{m}}$                                    | $0.301^{+0.018}_{-0.017}$    | $r_*$                          | $144.1^{+1.0}_{-1.0}$           | $\sigma_8(0.38)$          | $0.663^{+0.013}_{-0.012}$    |
| $\Omega_{\text{m}}h^2$                                 | $0.1419^{+0.0026}_{-0.0028}$ | $100\theta_*$                  | $1.0395^{+0.0016}_{-0.0015}$    | $f\sigma_8(0.51)$         | $0.469^{+0.014}_{-0.013}$    |
| $\Omega_{\text{m}}h^3$                                 | $0.0974^{+0.0024}_{-0.0022}$ | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.87^{+0.10}_{-0.099}$        | $\sigma_8(0.51)$          | $0.621^{+0.012}_{-0.011}$    |
| $\sigma_8$   | $0.807^{+0.018}_{-0.017}$    | $z_{\text{drag}}$              | $1062.4^{+2.8}_{-2.6}$          | $f\sigma_8(0.61)$         | $0.465^{+0.013}_{-0.012}$    |
| $S_8$  | $0.809^{+0.035}_{-0.034}$    | $r_{\text{drag}}$              | $146.4^{+1.3}_{-1.4}$           | $\sigma_8(0.61)$          | $0.591^{+0.012}_{-0.011}$    |
| $\sigma_8\Omega_{\text{m}}^{0.5}$                      | $0.443^{+0.019}_{-0.019}$    | $k_{\text{D}}$                 | $0.1424^{+0.0022}_{-0.0022}$    | $f\sigma_8(2.33)$         | $0.2986^{+0.0057}_{-0.0055}$ |
| $\sigma_8\Omega_{\text{m}}^{0.25}$                     | $0.598^{+0.019}_{-0.018}$    | $100\theta_{\text{D}}$         | $0.1591^{+0.0016}_{-0.0015}$    | $\sigma_8(2.33)$          | $0.3083^{+0.0061}_{-0.0055}$ |
| $\sigma_8/h^{0.5}$                                     | $0.975^{+0.027}_{-0.026}$    | $z_{\text{eq}}$                | $3376^{+63}_{-67}$              | $\chi_{\text{small}}^2$   | $396.4 (\nu: 0.8)$           |
| $r_{\text{drag}}h$                                     | $100.5^{+2.2}_{-2.2}$        | $k_{\text{eq}}$                | $0.01030^{+0.00019}_{-0.00020}$ | $\chi_{\text{CamSpec}}^2$ | $1890.7 (\nu: 4.0)$          |
| $\langle d^2 \rangle^{1/2}$                            | $2.434^{+0.064}_{-0.064}$    | $100\theta_{\text{eq}}$        | $0.820^{+0.012}_{-0.011}$       | $\chi_{6\text{DF}}^2$     | $0.052 (\nu: 0.0)$           |
| $z_{\text{re}}$  | $< 8.44$                     | $100\theta_{\text{s,eq}}$      | $0.4521^{+0.0061}_{-0.0058}$    | $\chi_{\text{MGS}}^2$     | $1.75 (\nu: 0.2)$            |
| $10^9 A_{\text{s}}$                                    | $2.144^{+0.079}_{-0.070}$    | $H(0.15)$                      | $73.8^{+1.5}_{-1.5}$            | $\chi_{\text{DR12BAO}}^2$ | $4.6 (\nu: 1.0)$             |
| $10^9 A_{\text{s}}e^{-2\tau}$                          | $1.923^{+0.046}_{-0.047}$    | $D_{\text{M}}(0.15)$           | $632^{+14}_{-14}$               | $\chi_{\text{prior}}^2$   | $11.0 (\nu: 0.9)$            |
| $D_{40}$   | $1259^{+58}_{-60}$           | $H(0.38)$                      | $83.8^{+1.3}_{-1.2}$            | $\chi_{\text{BAO}}^2$     | $6.4 (\nu: 0.8)$             |
| $D_{220}$  | $5986^{+260}_{-260}$         | $D_{\text{M}}(0.38)$           | $1511^{+29}_{-29}$              | $\chi_{\text{CMB}}^2$     | $2287.1 (\nu: 4.7)$          |
| $\bar{\chi}_{\text{eff}}^2 = 2304.51; R - 1 = 0.01190$ |                              |                                |                                 |                           |                              |



## 2.24 base\_CamSpecHM\_EE\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                   | 95% limits                   | Parameter             | 95% limits                      | Parameter          | 95% limits                   |
|-----------------------------|------------------------------|-----------------------|---------------------------------|--------------------|------------------------------|
| $\Omega_b h^2$              | $0.0232^{+0.0010}_{-0.0010}$ | $D_{1420}$            | $833^{+21}_{-22}$               | $H(0.61)$          | $95.82^{+0.98}_{-0.98}$      |
| $\Omega_c h^2$              | $0.1171^{+0.0027}_{-0.0026}$ | $D_{2000}$            | $236.5^{+7.9}_{-7.9}$           | $D_M(0.61)$        | $2283^{+38}_{-36}$           |
| $100\theta_{MC}$            | $1.0395^{+0.0014}_{-0.0015}$ | $n_{s,0.002}$         | $0.969^{+0.018}_{-0.018}$       | $H(2.33)$          | $235.3^{+1.5}_{-1.5}$        |
| $\tau$                      | $0.0526^{+0.010}_{-0.0082}$  | $Y_P$                 | $0.24573^{+0.00038}_{-0.00041}$ | $D_M(2.33)$        | $5739^{+51}_{-50}$           |
| $\ln(10^{10} A_s)$          | $3.051^{+0.025}_{-0.023}$    | $Y_P^{BBN}$           | $0.24706^{+0.00039}_{-0.00041}$ | $f\sigma_8(0.15)$  | $0.444^{+0.017}_{-0.016}$    |
| $n_s$                       | $0.969^{+0.018}_{-0.018}$    | $10^5 D/H$            | $2.44^{+0.18}_{-0.17}$          | $\sigma_8(0.15)$   | $0.741^{+0.012}_{-0.012}$    |
| $y_{cal}$                   | $0.9997^{+0.0045}_{-0.0045}$ | Age/Gyr               | $13.74^{+0.12}_{-0.11}$         | $f\sigma_8(0.38)$  | $0.464^{+0.014}_{-0.014}$    |
| $H_0$                       | $68.6^{+1.5}_{-1.6}$         | $z_*$                 | $1088.7^{+1.4}_{-1.3}$          | $\sigma_8(0.38)$   | $0.658^{+0.010}_{-0.0094}$   |
| $\Omega_\Lambda$            | $0.700^{+0.016}_{-0.017}$    | $r_*$                 | $144.56^{+0.73}_{-0.71}$        | $f\sigma_8(0.51)$  | $0.464^{+0.012}_{-0.012}$    |
| $\Omega_m$                  | $0.300^{+0.017}_{-0.016}$    | $100\theta_*$         | $1.0396^{+0.0015}_{-0.0015}$    | $\sigma_8(0.51)$   | $0.6164^{+0.0092}_{-0.0087}$ |
| $\Omega_m h^2$              | $0.1409^{+0.0022}_{-0.0022}$ | $D_M(z_*)/\text{Gpc}$ | $13.905^{+0.076}_{-0.075}$      | $f\sigma_8(0.61)$  | $0.460^{+0.010}_{-0.011}$    |
| $\Omega_m h^3$              | $0.0967^{+0.0019}_{-0.0019}$ | $z_{drag}$            | $1061.6^{+2.2}_{-2.2}$          | $\sigma_8(0.61)$   | $0.5868^{+0.0087}_{-0.0081}$ |
| $\sigma_8$                  | $0.800^{+0.014}_{-0.013}$    | $r_{drag}$            | $146.96^{+0.96}_{-0.95}$        | $f\sigma_8(2.33)$  | $0.2964^{+0.0044}_{-0.0040}$ |
| $S_8$                       | $0.800^{+0.034}_{-0.032}$    | $k_D$                 | $0.1416^{+0.0016}_{-0.0016}$    | $\sigma_8(2.33)$   | $0.3061^{+0.0046}_{-0.0043}$ |
| $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.018}_{-0.017}$    | $100\theta_D$         | $0.1596^{+0.0013}_{-0.0013}$    | $\chi^2_{lensing}$ | $9.4 (\nu: 1.1)$             |
| $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.016}_{-0.016}$    | $z_{eq}$              | $3352^{+53}_{-53}$              | $\chi^2_{simall}$  | $396.15 (\nu: 0.3)$          |
| $\sigma_8/h^{0.5}$          | $0.966^{+0.024}_{-0.025}$    | $k_{eq}$              | $0.01023^{+0.00016}_{-0.00016}$ | $\chi^2_{CamSpec}$ | $1890.9 (\nu: 3.8)$          |
| $r_{drag} h$                | $100.8^{+2.1}_{-2.1}$        | $100\theta_{eq}$      | $0.824^{+0.010}_{-0.011}$       | $\chi^2_{6DF}$     | $0.052 (\nu: 0.0)$           |
| $\langle d^2 \rangle^{1/2}$ | $2.414^{+0.056}_{-0.054}$    | $100\theta_{s,eq}$    | $0.4541^{+0.0051}_{-0.0052}$    | $\chi^2_{MGS}$     | $1.96 (\nu: 0.2)$            |
| $z_{re}$                    | $< 8.24$                     | $H(0.15)$             | $73.8^{+1.4}_{-1.4}$            | $\chi^2_{DR12BAO}$ | $4.3 (\nu: 0.5)$             |
| $10^9 A_s$                  | $2.114^{+0.054}_{-0.049}$    | $D_M(0.15)$           | $633^{+14}_{-13}$               | $\chi^2_{prior}$   | $11.0 (\nu: 0.8)$            |
| $10^9 A_s e^{-2\tau}$       | $1.903^{+0.032}_{-0.031}$    | $H(0.38)$             | $83.7^{+1.2}_{-1.2}$            | $\chi^2_{CMB}$     | $2296.5 (\nu: 5.0)$          |
| $D_{40}$                    | $1246^{+53}_{-53}$           | $D_M(0.38)$           | $1512^{+29}_{-27}$              | $\chi^2_{BAO}$     | $6.3 (\nu: 0.7)$             |
| $D_{220}$                   | $5914^{+210}_{-210}$         | $H(0.51)$             | $90.3^{+1.0}_{-1.1}$            |                    |                              |
| $D_{810}$                   | $2577^{+46}_{-48}$           | $D_M(0.51)$           | $1961^{+35}_{-33}$              |                    |                              |

$$\bar{\chi}^2_{\text{eff}} = 2313.75; R - 1 = 0.00861$$



## 2.25 base\_CamSpecHM\_TE\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02247  | $0.02248^{+0.00051}_{-0.00050}$ | $D_{220}$             | 5733     | $5734^{+110}_{-110}$            | $H(0.38)$          | 83.45    | $83.5^{+1.0}_{-0.98}$        |
| $\Omega_c h^2$              | 0.11787  | $0.1179^{+0.0033}_{-0.0032}$    | $D_{810}$             | 2557.1   | $2557^{+43}_{-43}$              | $D_M(0.38)$        | 1517.4   | $1517^{+26}_{-26}$           |
| $100\theta_{MC}$            | 1.04129  | $1.04130^{+0.00096}_{-0.00096}$ | $D_{1420}$            | 827.6    | $827^{+21}_{-22}$               | $H(0.51)$          | 90.07    | $90.08^{+0.82}_{-0.80}$      |
| $\tau$                      | 0.0528   | $0.053^{+0.015}_{-0.015}$       | $D_{2000}$            | 234.4    | $234.3^{+7.9}_{-7.9}$           | $D_M(0.51)$        | 1967.1   | $1967^{+31}_{-30}$           |
| $\ln(10^{10} A_s)$          | 3.0418   | $3.041^{+0.030}_{-0.030}$       | $n_{s,0.002}$         | 0.9770   | $0.977^{+0.022}_{-0.022}$       | $H(0.61)$          | 95.62    | $95.63^{+0.69}_{-0.67}$      |
| $n_s$                       | 0.9770   | $0.977^{+0.022}_{-0.022}$       | $Y_P$                 | 0.245433 | $0.24543^{+0.00021}_{-0.00020}$ | $D_M(0.61)$        | 2290.2   | $2290^{+33}_{-33}$           |
| $y_{cal}$                   | 1.00021  | $1.0001^{+0.0050}_{-0.0049}$    | $Y_P^{BBN}$           | 0.246759 | $0.24676^{+0.00021}_{-0.00021}$ | $H(2.33)$          | 235.28   | $235.3^{+2.0}_{-1.9}$        |
| $H_0$                       | 68.31    | $68.3^{+1.5}_{-1.5}$            | $10^5 D/H$            | 2.568    | $2.567^{+0.093}_{-0.091}$       | $D_M(2.33)$        | 5749.6   | $5749^{+32}_{-32}$           |
| $\Omega_\Lambda$            | 0.6979   | $0.698^{+0.019}_{-0.020}$       | Age/Gyr               | 13.767   | $13.766^{+0.072}_{-0.073}$      | $f\sigma_8(0.15)$  | 0.4486   | $0.448^{+0.017}_{-0.016}$    |
| $\Omega_m$                  | 0.3021   | $0.302^{+0.020}_{-0.019}$       | $z_*$                 | 1089.61  | $1089.61^{+0.81}_{-0.78}$       | $\sigma_8(0.15)$   | 0.7463   | $0.746^{+0.012}_{-0.013}$    |
| $\Omega_m h^2$              | 0.14098  | $0.1410^{+0.0031}_{-0.0030}$    | $r_*$                 | 144.91   | $144.91^{+0.76}_{-0.75}$        | $f\sigma_8(0.38)$  | 0.4690   | $0.469^{+0.013}_{-0.013}$    |
| $\Omega_m h^3$              | 0.09631  | $0.0963^{+0.0010}_{-0.00099}$   | $100\theta_*$         | 1.04147  | $1.04147^{+0.00095}_{-0.00095}$ | $\sigma_8(0.38)$   | 0.6625   | $0.662^{+0.011}_{-0.011}$    |
| $\sigma_8$                  | 0.8066   | $0.806^{+0.014}_{-0.014}$       | $D_M(z_*)/\text{Gpc}$ | 13.914   | $13.914^{+0.072}_{-0.072}$      | $f\sigma_8(0.51)$  | 0.4687   | $0.468^{+0.012}_{-0.012}$    |
| $S_8$                       | 0.8094   | $0.809^{+0.034}_{-0.032}$       | $z_{drag}$            | 1060.01  | $1060.0^{+1.1}_{-1.1}$          | $\sigma_8(0.51)$   | 0.6205   | $0.620^{+0.011}_{-0.011}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4433   | $0.443^{+0.018}_{-0.018}$       | $r_{drag}$            | 147.55   | $147.54^{+0.78}_{-0.78}$        | $f\sigma_8(0.61)$  | 0.4645   | $0.464^{+0.010}_{-0.010}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5980   | $0.598^{+0.016}_{-0.016}$       | $k_D$                 | 0.14046  | $0.14047^{+0.00099}_{-0.00097}$ | $\sigma_8(0.61)$   | 0.5906   | $0.590^{+0.010}_{-0.010}$    |
| $\sigma_8/h^{0.5}$          | 0.9759   | $0.975^{+0.022}_{-0.022}$       | $100\theta_D$         | 0.16075  | $0.16075^{+0.00063}_{-0.00061}$ | $f\sigma_8(2.33)$  | 0.2982   | $0.2981^{+0.0053}_{-0.0053}$ |
| $r_{drag} h$                | 100.80   | $100.8^{+2.6}_{-2.6}$           | $z_{eq}$              | 3354     | $3354^{+74}_{-72}$              | $\sigma_8(2.33)$   | 0.3078   | $0.3077^{+0.0059}_{-0.0059}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.396    | $2.396^{+0.066}_{-0.065}$       | $k_{eq}$              | 0.010235 | $0.01024^{+0.00022}_{-0.00022}$ | $\chi^2_{lensing}$ | 8.95     | 9.7 ( $\nu: 0.8$ )           |
| $z_{re}$                    | 7.48     | $7.4^{+1.5}_{-1.6}$             | $100\theta_{eq}$      | 0.8227   | $0.823^{+0.014}_{-0.014}$       | $\chi^2_{small}$   | 395.77   | 396.7 ( $\nu: 0.9$ )         |
| $10^9 A_s$                  | 2.094    | $2.093^{+0.064}_{-0.063}$       | $100\theta_{s,eq}$    | 0.4542   | $0.4542^{+0.0072}_{-0.0071}$    | $\chi^2_{CamSpec}$ | 2576.3   | 2580.7 ( $\nu: 4.3$ )        |
| $10^9 A_s e^{-2\tau}$       | 1.8842   | $1.884^{+0.027}_{-0.027}$       | $H(0.15)$             | 73.50    | $73.5^{+1.3}_{-1.3}$            | $\chi^2_{prior}$   | 10.04    | 11.0 ( $\nu: 1.1$ )          |
| $D_{40}$                    | 1208     | $1208^{+51}_{-50}$              | $D_M(0.15)$           | 635.3    | $635^{+13}_{-13}$               | $\chi^2_{CMB}$     | 2981.0   | 2987.1 ( $\nu: 5.9$ )        |

Best-fit  $\chi^2_{eff} = 2991.07$ ;  $\bar{\chi}^2_{eff} = 2998.15$ ;  $R - 1 = 0.00781$

$\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.95 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.77 CamSpec like\_10.7HM\_1400\_unified: 2576.31



## 2.26 base\_CamSpecHM\_TE\_lowE\_lensing\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$             | $0.02248^{+0.00051}_{-0.00050}$ | $D_{220}$                          | $5732^{+110}_{-110}$            | $H(0.38)$                   | $83.49^{+0.99}_{-0.98}$      |
| $\Omega_{\mathrm{c}}h^2$             | $0.1177^{+0.0032}_{-0.0032}$    | $D_{810}$                          | $2556^{+42}_{-42}$              | $D_{\mathrm{M}}(0.38)$      | $1516^{+26}_{-25}$           |
| $100\theta_{\mathrm{MC}}$            | $1.04131^{+0.00096}_{-0.00096}$ | $D_{1420}$                         | $827^{+21}_{-21}$               | $H(0.51)$                   | $90.11^{+0.82}_{-0.80}$      |
| $\tau$                               | $0.054^{+0.012}_{-0.011}$       | $D_{2000}$                         | $234.4^{+7.9}_{-7.8}$           | $D_{\mathrm{M}}(0.51)$      | $1966^{+31}_{-30}$           |
| $\ln(10^{10}A_{\mathrm{s}})$         | $3.044^{+0.026}_{-0.025}$       | $n_{\mathrm{s},0.002}$             | $0.977^{+0.022}_{-0.022}$       | $H(0.61)$                   | $95.65^{+0.69}_{-0.67}$      |
| $n_{\mathrm{s}}$                     | $0.977^{+0.022}_{-0.022}$       | $Y_{\mathrm{P}}$                   | $0.24544^{+0.00021}_{-0.00020}$ | $D_{\mathrm{M}}(0.61)$      | $2289^{+33}_{-33}$           |
| $y_{\mathrm{cal}}$                   | $1.0001^{+0.0050}_{-0.0049}$    | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24676^{+0.00021}_{-0.00020}$ | $H(2.33)$                   | $235.2^{+1.9}_{-1.9}$        |
| $H_0$                                | $68.4^{+1.5}_{-1.5}$            | $10^5\mathrm{D}/\mathrm{H}$        | $2.566^{+0.093}_{-0.091}$       | $D_{\mathrm{M}}(2.33)$      | $5748^{+32}_{-32}$           |
| $\Omega_{\Lambda}$                   | $0.699^{+0.019}_{-0.020}$       | Age/Gyr                            | $13.765^{+0.072}_{-0.073}$      | $f\sigma_8(0.15)$           | $0.448^{+0.017}_{-0.017}$    |
| $\Omega_{\mathrm{m}}$                | $0.301^{+0.020}_{-0.019}$       | $z_*$                              | $1089.59^{+0.81}_{-0.78}$       | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.011}$    |
| $\Omega_{\mathrm{m}}h^2$             | $0.1409^{+0.0030}_{-0.0030}$    | $r_*$                              | $144.93^{+0.75}_{-0.74}$        | $f\sigma_8(0.38)$           | $0.469^{+0.013}_{-0.013}$    |
| $\Omega_{\mathrm{m}}h^3$             | $0.0963^{+0.0010}_{-0.00099}$   | $100\theta_*$                      | $1.04148^{+0.00095}_{-0.00095}$ | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0096}$   |
| $\sigma_8$                           | $0.807^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.916^{+0.071}_{-0.071}$      | $f\sigma_8(0.51)$           | $0.469^{+0.011}_{-0.012}$    |
| $S_8$                                | $0.809^{+0.034}_{-0.032}$       | $z_{\mathrm{drag}}$                | $1060.0^{+1.1}_{-1.1}$          | $\sigma_8(0.51)$            | $0.6211^{+0.0099}_{-0.0090}$ |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.443^{+0.019}_{-0.018}$       | $r_{\mathrm{drag}}$                | $147.57^{+0.77}_{-0.78}$        | $f\sigma_8(0.61)$           | $0.465^{+0.010}_{-0.010}$    |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.598^{+0.016}_{-0.016}$       | $k_{\mathrm{D}}$                   | $0.14045^{+0.00099}_{-0.00097}$ | $\sigma_8(0.61)$            | $0.5912^{+0.0095}_{-0.0086}$ |
| $\sigma_8/h^{0.5}$                   | $0.976^{+0.022}_{-0.022}$       | $100\theta_{\mathrm{D}}$           | $0.16074^{+0.00063}_{-0.00061}$ | $f\sigma_8(2.33)$           | $0.2985^{+0.0050}_{-0.0044}$ |
| $r_{\mathrm{drag}}h$                 | $100.9^{+2.6}_{-2.6}$           | $z_{\mathrm{eq}}$                  | $3351^{+72}_{-72}$              | $\sigma_8(2.33)$            | $0.3082^{+0.0053}_{-0.0051}$ |
| $\langle d^2 \rangle^{1/2}$          | $2.397^{+0.066}_{-0.064}$       | $k_{\mathrm{eq}}$                  | $0.01023^{+0.00022}_{-0.00022}$ | $\chi_{\mathrm{lensing}}^2$ | $9.7 (\nu: 0.8)$             |
| $z_{\mathrm{re}}$                    | $< 8.72$                        | $100\theta_{\mathrm{eq}}$          | $0.823^{+0.014}_{-0.014}$       | $\chi_{\mathrm{simall}}^2$  | $396.6 (\nu: 0.8)$           |
| $10^9 A_{\mathrm{s}}$                | $2.100^{+0.056}_{-0.052}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4545^{+0.0072}_{-0.0071}$    | $\chi_{\mathrm{CamSpec}}^2$ | $2580.6 (\nu: 4.2)$          |
| $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.883^{+0.027}_{-0.027}$       | $H(0.15)$                          | $73.6^{+1.3}_{-1.3}$            | $\chi_{\mathrm{prior}}^2$   | $11.0 (\nu: 1.1)$            |
| $D_{40}$                             | $1207^{+50}_{-49}$              | $D_{\mathrm{M}}(0.15)$             | $635^{+13}_{-12}$               | $\chi_{\mathrm{CMB}}^2$     | $2986.8 (\nu: 5.5)$          |

$$\bar{\chi}_{\mathrm{eff}}^2 = 2997.86; R - 1 = 0.00847$$



## 2.27 base\_CamSpecHM\_EE\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                   | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02359  | $0.0236^{+0.0019}_{-0.0018}$ | $D_{220}$             | 5980     | $5980^{+320}_{-310}$            | $H(0.38)$          | 84.21    | $84.2^{+2.8}_{-2.6}$         |
| $\Omega_c h^2$              | 0.1160   | $0.1162^{+0.0060}_{-0.0058}$ | $D_{810}$             | 2590     | $2591^{+66}_{-66}$              | $D_M(0.38)$        | 1499     | $1501^{+65}_{-63}$           |
| $100\theta_{MC}$            | 1.03953  | $1.0395^{+0.0017}_{-0.0016}$ | $D_{1420}$            | 839.4    | $839^{+32}_{-32}$               | $H(0.51)$          | 90.74    | $90.7^{+2.4}_{-2.2}$         |
| $\tau$                      | 0.0500   | $0.049^{+0.017}_{-0.019}$    | $D_{2000}$            | 238.9    | $239^{+12}_{-12}$               | $D_M(0.51)$        | 1945     | $1947^{+78}_{-76}$           |
| $\ln(10^{10} A_s)$          | 3.0489   | $3.047^{+0.037}_{-0.039}$    | $n_{s,0.002}$         | 0.9718   | $0.972^{+0.024}_{-0.024}$       | $H(0.61)$          | 96.22    | $96.2^{+2.2}_{-1.9}$         |
| $n_s$                       | 0.9718   | $0.972^{+0.024}_{-0.024}$    | $Y_P$                 | 0.24590  | $0.24588^{+0.00076}_{-0.00075}$ | $D_M(0.61)$        | 2266     | $2268^{+85}_{-84}$           |
| $y_{cal}$                   | 0.99978  | $0.9999^{+0.0048}_{-0.0048}$ | $Y_P^{BBN}$           | 0.24723  | $0.24721^{+0.00076}_{-0.00075}$ | $H(2.33)$          | 235.02   | $235.1^{+2.6}_{-2.3}$        |
| $H_0$                       | 69.33    | $69.3^{+3.8}_{-3.7}$         | $10^5 D/H$            | 2.373    | $2.38^{+0.32}_{-0.29}$          | $D_M(2.33)$        | 5719     | $5719^{+96}_{-100}$          |
| $\Omega_\Lambda$            | 0.7082   | $0.707^{+0.039}_{-0.040}$    | Age/Gyr               | 13.698   | $13.70^{+0.22}_{-0.23}$         | $f\sigma_8(0.15)$  | 0.4353   | $0.436^{+0.036}_{-0.034}$    |
| $\Omega_m$                  | 0.2918   | $0.293^{+0.040}_{-0.039}$    | $z_*$                 | 1088.12  | $1088.2^{+2.6}_{-2.5}$          | $\sigma_8(0.15)$   | 0.7364   | $0.736^{+0.015}_{-0.017}$    |
| $\Omega_m h^2$              | 0.14024  | $0.1404^{+0.0046}_{-0.0043}$ | $r_*$                 | 144.53   | $144.49^{+0.80}_{-0.80}$        | $f\sigma_8(0.38)$  | 0.4576   | $0.458^{+0.027}_{-0.027}$    |
| $\Omega_m h^3$              | 0.09723  | $0.0973^{+0.0030}_{-0.0027}$ | $100\theta_*$         | 1.03959  | $1.0396^{+0.0016}_{-0.0016}$    | $\sigma_8(0.38)$   | 0.6549   | $0.654^{+0.012}_{-0.013}$    |
| $\sigma_8$                  | 0.7948   | $0.794^{+0.019}_{-0.021}$    | $D_M(z_*)/\text{Gpc}$ | 13.903   | $13.899^{+0.079}_{-0.080}$      | $f\sigma_8(0.51)$  | 0.4585   | $0.458^{+0.022}_{-0.023}$    |
| $S_8$                       | 0.784    | $0.785^{+0.071}_{-0.067}$    | $z_{drag}$            | 1062.45  | $1062.4^{+3.8}_{-3.7}$          | $\sigma_8(0.51)$   | 0.6138   | $0.613^{+0.011}_{-0.012}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4293   | $0.430^{+0.039}_{-0.036}$    | $r_{drag}$            | 146.80   | $146.8^{+1.0}_{-1.1}$           | $f\sigma_8(0.61)$  | 0.4552   | $0.455^{+0.019}_{-0.020}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5841   | $0.584^{+0.032}_{-0.032}$    | $k_D$                 | 0.14204  | $0.1420^{+0.0021}_{-0.0021}$    | $\sigma_8(0.61)$   | 0.5846   | $0.584^{+0.010}_{-0.011}$    |
| $\sigma_8/h^{0.5}$          | 0.9545   | $0.954^{+0.045}_{-0.046}$    | $100\theta_D$         | 0.15909  | $0.1591^{+0.0021}_{-0.0020}$    | $f\sigma_8(2.33)$  | 0.2956   | $0.2952^{+0.0054}_{-0.0056}$ |
| $r_{drag} h$                | 101.8    | $101.7^{+5.2}_{-5.2}$        | $z_{eq}$              | 3336     | $3340^{+110}_{-100}$            | $\sigma_8(2.33)$   | 0.3056   | $0.3052^{+0.0065}_{-0.0066}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.393    | $2.392^{+0.091}_{-0.090}$    | $k_{eq}$              | 0.010182 | $0.01019^{+0.00033}_{-0.00031}$ | $\chi^2_{lensing}$ | 8.34     | $9.4 (\nu: 1.0)$             |
| $z_{re}$                    | 6.93     | $6.8^{+1.7}_{-1.8}$          | $100\theta_{eq}$      | 0.8277   | $0.827^{+0.024}_{-0.024}$       | $\chi^2_{small}$   | 395.63   | $396.8 (\nu: 1.4)$           |
| $10^9 A_s$                  | 2.109    | $2.105^{+0.078}_{-0.080}$    | $100\theta_{s,eq}$    | 0.4559   | $0.456^{+0.011}_{-0.011}$       | $\chi^2_{CamSpec}$ | 1887.5   | $1891.5 (\nu: 4.2)$          |
| $10^9 A_s e^{-2\tau}$       | 1.9083   | $1.910^{+0.037}_{-0.035}$    | $H(0.15)$             | 74.41    | $74.4^{+3.4}_{-3.3}$            | $\chi^2_{prior}$   | 10.04    | $11.0 (\nu: 0.9)$            |
| $D_{40}$                    | 1249     | $1249^{+54}_{-53}$           | $D_M(0.15)$           | 626.7    | $627^{+32}_{-30}$               | $\chi^2_{CMB}$     | 2291.5   | $2297.7 (\nu: 6.4)$          |

Best-fit  $\chi^2_{eff} = 2301.54$ ;  $\bar{\chi}^2_{eff} = 2308.71$ ;  $R - 1 = 0.00642$

$\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.34 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.63 CamSpec like\_10.7HM\_1400\_unified: 1887.54



## 2.28 base\_CamSpecHM\_EE\_lowE\_lensing\_post\_zre6p5

| Parameter                          | 95% limits                   | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.0236^{+0.0019}_{-0.0018}$ | $D_{220}$                      | $5975^{+310}_{-300}$            | $H(0.38)$                 | $84.3^{+2.8}_{-2.5}$         |
| $\Omega_{\text{c}}h^2$             | $0.1158^{+0.0057}_{-0.0056}$ | $D_{810}$                      | $2589^{+66}_{-65}$              | $D_{\text{M}}(0.38)$      | $1498^{+62}_{-64}$           |
| $100\theta_{\text{MC}}$            | $1.0396^{+0.0017}_{-0.0016}$ | $D_{1420}$                     | $839^{+32}_{-32}$               | $H(0.51)$                 | $90.8^{+2.4}_{-2.3}$         |
| $\tau$                             | $0.0535^{+0.012}_{-0.0099}$  | $D_{2000}$                     | $239^{+12}_{-12}$               | $D_{\text{M}}(0.51)$      | $1944^{+74}_{-77}$           |
| $\ln(10^{10}A_{\text{s}})$         | $3.055^{+0.033}_{-0.028}$    | $n_{\text{s},0.002}$           | $0.973^{+0.024}_{-0.024}$       | $H(0.61)$                 | $96.3^{+2.1}_{-2.0}$         |
| $n_{\text{s}}$                     | $0.973^{+0.024}_{-0.024}$    | $Y_{\text{P}}$                 | $0.24588^{+0.00076}_{-0.00073}$ | $D_{\text{M}}(0.61)$      | $2265^{+81}_{-85}$           |
| $y_{\text{cal}}$                   | $0.9998^{+0.0049}_{-0.0048}$ | $Y_{\text{P}}^{\text{BBN}}$    | $0.24721^{+0.00076}_{-0.00074}$ | $H(2.33)$                 | $234.9^{+2.4}_{-2.2}$        |
| $H_0$                              | $69.4^{+3.8}_{-3.5}$         | $10^5 D/\text{H}$              | $2.38^{+0.31}_{-0.29}$          | $D_{\text{M}}(2.33)$      | $5718^{+95}_{-100}$          |
| $\Omega_{\Lambda}$                 | $0.709^{+0.037}_{-0.040}$    | Age/Gyr                        | $13.70^{+0.22}_{-0.23}$         | $f\sigma_8(0.15)$         | $0.436^{+0.034}_{-0.034}$    |
| $\Omega_{\text{m}}$                | $0.291^{+0.040}_{-0.037}$    | $z_*$                          | $1088.1^{+2.6}_{-2.5}$          | $\sigma_8(0.15)$          | $0.738^{+0.014}_{-0.015}$    |
| $\Omega_{\text{m}}h^2$             | $0.1400^{+0.0043}_{-0.0041}$ | $r_*$                          | $144.58^{+0.77}_{-0.75}$        | $f\sigma_8(0.38)$         | $0.458^{+0.026}_{-0.027}$    |
| $\Omega_{\text{m}}h^3$             | $0.0972^{+0.0029}_{-0.0028}$ | $100\theta_*$                  | $1.0396^{+0.0016}_{-0.0016}$    | $\sigma_8(0.38)$          | $0.656^{+0.010}_{-0.011}$    |
| $\sigma_8$                         | $0.796^{+0.018}_{-0.020}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.907^{+0.078}_{-0.077}$      | $f\sigma_8(0.51)$         | $0.459^{+0.022}_{-0.023}$    |
| $S_8$                              | $0.785^{+0.068}_{-0.067}$    | $z_{\text{drag}}$              | $1062.4^{+3.8}_{-3.7}$          | $\sigma_8(0.51)$          | $0.6153^{+0.0097}_{-0.0093}$ |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.430^{+0.037}_{-0.037}$    | $r_{\text{drag}}$              | $146.9^{+1.0}_{-1.0}$           | $f\sigma_8(0.61)$         | $0.456^{+0.019}_{-0.020}$    |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.585^{+0.031}_{-0.032}$    | $k_{\text{D}}$                 | $0.1419^{+0.0021}_{-0.0021}$    | $\sigma_8(0.61)$          | $0.5861^{+0.0090}_{-0.0085}$ |
| $\sigma_8/h^{0.5}$                 | $0.956^{+0.044}_{-0.046}$    | $100\theta_{\text{D}}$         | $0.1592^{+0.0021}_{-0.0019}$    | $f\sigma_8(2.33)$         | $0.2964^{+0.0048}_{-0.0044}$ |
| $r_{\text{drag}}h$                 | $102.0^{+5.2}_{-4.9}$        | $z_{\text{eq}}$                | $3331^{+100}_{-99}$             | $\sigma_8(2.33)$          | $0.3065^{+0.0058}_{-0.0053}$ |
| $\langle d^2 \rangle^{1/2}$        | $2.396^{+0.088}_{-0.089}$    | $k_{\text{eq}}$                | $0.01017^{+0.00031}_{-0.00030}$ | $\chi^2_{\text{lensing}}$ | $9.4 (\nu: 1.1)$             |
| $z_{\text{re}}$                    | $< 8.24$                     | $100\theta_{\text{eq}}$        | $0.829^{+0.023}_{-0.023}$       | $\chi^2_{\text{simall}}$  | $396.18 (\nu: 0.4)$          |
| $10^9 A_{\text{s}}$                | $2.122^{+0.066}_{-0.062}$    | $100\theta_{\text{s,eq}}$      | $0.456^{+0.011}_{-0.011}$       | $\chi^2_{\text{CamSpec}}$ | $1891.6 (\nu: 4.2)$          |
| $10^9 A_{\text{s}}e^{-2\tau}$      | $1.907^{+0.036}_{-0.034}$    | $H(0.15)$                      | $74.5^{+3.4}_{-3.1}$            | $\chi^2_{\text{prior}}$   | $11.0 (\nu: 0.9)$            |
| $D_{40}$                           | $1247^{+53}_{-53}$           | $D_{\text{M}}(0.15)$           | $626^{+30}_{-30}$               | $\chi^2_{\text{CMB}}$     | $2297.2 (\nu: 5.5)$          |

$$\bar{\chi}^2_{\text{eff}} = 2308.23; R - 1 = 0.00344$$



## 2.29 base\_CamSpecHM\_TE\_lowE\_lensing\_BAO\_CookeDH

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022416 | $0.02240^{+0.00041}_{-0.00040}$ | $D_{1420}$            | 825.5    | $825^{+19}_{-19}$               | $H(0.61)$          | 95.551   | $95.54^{+0.48}_{-0.48}$      |
| $\Omega_c h^2$              | 0.11819  | $0.1182^{+0.0022}_{-0.0021}$    | $D_{2000}$            | 233.6    | $233.5^{+7.1}_{-7.1}$           | $D_M(0.61)$        | 2293.6   | $2294^{+22}_{-21}$           |
| $100\theta_{MC}$            | 1.04130  | $1.04127^{+0.00093}_{-0.00092}$ | $n_{s,0.002}$         | 0.9746   | $0.975^{+0.019}_{-0.019}$       | $H(2.33)$          | 235.45   | $235.4^{+1.4}_{-1.4}$        |
| $\tau$                      | 0.0520   | $0.052^{+0.014}_{-0.015}$       | $Y_P$                 | 0.245414 | $0.24541^{+0.00016}_{-0.00016}$ | $D_M(2.33)$        | 5752.6   | $5753^{+24}_{-24}$           |
| $\ln(10^{10} A_s)$          | 3.0401   | $3.041^{+0.029}_{-0.029}$       | $Y_P^{BBN}$           | 0.246740 | $0.24673^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.15)$  | 0.4499   | $0.450^{+0.012}_{-0.012}$    |
| $n_s$                       | 0.9746   | $0.975^{+0.019}_{-0.019}$       | $10^5 D/H$            | 2.577    | $2.580^{+0.076}_{-0.074}$       | $\sigma_8(0.15)$   | 0.7460   | $0.746^{+0.012}_{-0.012}$    |
| $y_{cal}$                   | 1.00021  | $1.0001^{+0.0047}_{-0.0048}$    | Age/Gyr               | 13.774   | $13.776^{+0.055}_{-0.055}$      | $f\sigma_8(0.38)$  | 0.4698   | $0.470^{+0.010}_{-0.010}$    |
| $H_0$                       | 68.16    | $68.15^{+0.97}_{-0.99}$         | $z_*$                 | 1089.70  | $1089.72^{+0.58}_{-0.58}$       | $\sigma_8(0.38)$   | 0.6621   | $0.662^{+0.011}_{-0.011}$    |
| $\Omega_\Lambda$            | 0.6959   | $0.696^{+0.012}_{-0.013}$       | $r_*$                 | 144.86   | $144.88^{+0.57}_{-0.58}$        | $f\sigma_8(0.51)$  | 0.4693   | $0.4694^{+0.0095}_{-0.0094}$ |
| $\Omega_m$                  | 0.3041   | $0.304^{+0.013}_{-0.012}$       | $100\theta_*$         | 1.04148  | $1.04145^{+0.00093}_{-0.00091}$ | $\sigma_8(0.51)$   | 0.6199   | $0.620^{+0.010}_{-0.010}$    |
| $\Omega_m h^2$              | 0.14125  | $0.1412^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$ | 13.910   | $13.911^{+0.057}_{-0.058}$      | $f\sigma_8(0.61)$  | 0.4649   | $0.4651^{+0.0088}_{-0.0087}$ |
| $\Omega_m h^3$              | 0.09627  | $0.09624^{+0.00094}_{-0.00092}$ | $z_{drag}$            | 1059.89  | $1059.88^{+0.93}_{-0.90}$       | $\sigma_8(0.61)$   | 0.5901   | $0.5903^{+0.0098}_{-0.0095}$ |
| $\sigma_8$                  | 0.8065   | $0.807^{+0.013}_{-0.013}$       | $r_{drag}$            | 147.52   | $147.54^{+0.64}_{-0.64}$        | $f\sigma_8(2.33)$  | 0.2978   | $0.2979^{+0.0050}_{-0.0049}$ |
| $S_8$                       | 0.8119   | $0.812^{+0.024}_{-0.023}$       | $k_D$                 | 0.14045  | $0.14042^{+0.00088}_{-0.00086}$ | $\sigma_8(2.33)$   | 0.3074   | $0.3075^{+0.0053}_{-0.0052}$ |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4447   | $0.445^{+0.013}_{-0.013}$       | $100\theta_D$         | 0.16081  | $0.16083^{+0.00054}_{-0.00054}$ | $\chi^2_{lensing}$ | 8.95     | 9.6 ( $\nu: 0.6$ )           |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5989   | $0.599^{+0.013}_{-0.013}$       | $z_{eq}$              | 3360     | $3359^{+51}_{-50}$              | $\chi^2_{small}$   | 395.71   | 396.7 ( $\nu: 0.8$ )         |
| $\sigma_8/h^{0.5}$          | 0.9769   | $0.977^{+0.019}_{-0.019}$       | $k_{eq}$              | 0.010255 | $0.01025^{+0.00016}_{-0.00015}$ | $\chi^2_{CamSpec}$ | 2576.42  | 2580.2 ( $\nu: 3.6$ )        |
| $r_{drag} h$                | 100.55   | $100.5^{+1.7}_{-1.7}$           | $100\theta_{eq}$      | 0.8213   | $0.8214^{+0.0094}_{-0.0094}$    | $\chi^2_{6DF}$     | 0.000    | 0.030 ( $\nu: 0.0$ )         |
| $\langle d^2 \rangle^{1/2}$ | 2.402    | $2.403^{+0.056}_{-0.056}$       | $100\theta_{s,eq}$    | 0.45354  | $0.4536^{+0.0049}_{-0.0048}$    | $\chi^2_{MGS}$     | 1.75     | 1.80 ( $\nu: 0.1$ )          |
| $z_{re}$                    | 7.41     | $7.4^{+1.4}_{-1.6}$             | $H(0.15)$             | 73.36    | $73.35^{+0.85}_{-0.86}$         | $\chi^2_{DR12BAO}$ | 3.44     | 3.91 ( $\nu: 0.3$ )          |
| $10^9 A_s$                  | 2.091    | $2.092^{+0.061}_{-0.059}$       | $D_M(0.15)$           | 636.6    | $636.7^{+8.5}_{-8.2}$           | $\chi^2_{prior}$   | 10.22    | 11.3 ( $\nu: 1.0$ )          |
| $10^9 A_s e^{-2\tau}$       | 1.8842   | $1.884^{+0.026}_{-0.026}$       | $H(0.38)$             | 83.34    | $83.33^{+0.65}_{-0.66}$         | $\chi^2_{CMB}$     | 2981.1   | 2986.5 ( $\nu: 5.2$ )        |
| $D_{40}$                    | 1212.4   | $1212^{+48}_{-47}$              | $D_M(0.38)$           | 1520.0   | $1520^{+17}_{-17}$              | $\chi^2_{BAO}$     | 5.19     | 5.74 ( $\nu: 0.3$ )          |
| $D_{220}$                   | 5733     | $5729^{+110}_{-110}$            | $H(0.51)$             | 89.99    | $89.98^{+0.55}_{-0.55}$         |                    |          |                              |
| $D_{810}$                   | 2554.2   | $2553^{+39}_{-40}$              | $D_M(0.51)$           | 1970.3   | $1971^{+20}_{-20}$              |                    |          |                              |

Best-fit  $\chi^2_{eff} = 2996.49$ ;  $\bar{\chi}^2_{eff} = 3003.53$ ;  $R - 1 = 0.00799$

$\chi^2_{eff}$ : BAO - 6DF: 0.00 MGS: 1.75 DR12BAO: 3.44 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.95 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.71 CamSpec like\_10.7HM\_1400\_unified: 2576.42



### 2.30 base\_CamSpecHM\_EE\_lowE\_lensing\_BAO\_CookeDH

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02269  | $0.02268^{+0.00073}_{-0.00072}$ | $D_{1420}$            | 825.9    | $827^{+20}_{-19}$               | $H(0.61)$          | 95.37    | $95.36^{+0.73}_{-0.68}$      |
| $\Omega_c h^2$              | 0.11790  | $0.1179^{+0.0026}_{-0.0025}$    | $D_{2000}$            | 233.6    | $233.8^{+7.1}_{-7.0}$           | $D_M(0.61)$        | 2300.1   | $2301^{+28}_{-29}$           |
| $100\theta_{MC}$            | 1.03957  | $1.0395^{+0.0015}_{-0.0015}$    | $n_{s,0.002}$         | 0.9678   | $0.968^{+0.019}_{-0.019}$       | $H(2.33)$          | 235.36   | $235.4^{+1.6}_{-1.6}$        |
| $\tau$                      | 0.0499   | $0.049^{+0.015}_{-0.016}$       | $Y_P$                 | 0.245511 | $0.24552^{+0.00031}_{-0.00030}$ | $D_M(2.33)$        | 5762.5   | $5763^{+36}_{-38}$           |
| $\ln(10^{10} A_s)$          | 3.0408   | $3.040^{+0.029}_{-0.031}$       | $Y_P^{BBN}$           | 0.246838 | $0.24684^{+0.00031}_{-0.00030}$ | $f\sigma_8(0.15)$  | 0.4482   | $0.448^{+0.015}_{-0.015}$    |
| $n_s$                       | 0.9678   | $0.968^{+0.019}_{-0.019}$       | $10^5 D/H$            | 2.529    | $2.53^{+0.13}_{-0.13}$          | $\sigma_8(0.15)$   | 0.7407   | $0.740^{+0.013}_{-0.014}$    |
| $y_{cal}$                   | 0.9997   | $0.9999^{+0.0051}_{-0.0049}$    | Age/Gyr               | 13.797   | $13.799^{+0.084}_{-0.088}$      | $f\sigma_8(0.38)$  | 0.4675   | $0.468^{+0.012}_{-0.012}$    |
| $H_0$                       | 67.90    | $67.9^{+1.2}_{-1.2}$            | $z_*$                 | 1089.35  | $1089.36^{+0.99}_{-0.97}$       | $\sigma_8(0.38)$   | 0.6571   | $0.657^{+0.011}_{-0.012}$    |
| $\Omega_\Lambda$            | 0.6937   | $0.693^{+0.014}_{-0.015}$       | $r_*$                 | 144.73   | $144.73^{+0.67}_{-0.68}$        | $f\sigma_8(0.51)$  | 0.4668   | $0.467^{+0.011}_{-0.011}$    |
| $\Omega_m$                  | 0.3063   | $0.307^{+0.015}_{-0.014}$       | $100\theta_*$         | 1.03972  | $1.0397^{+0.0015}_{-0.0015}$    | $\sigma_8(0.51)$   | 0.6152   | $0.615^{+0.010}_{-0.011}$    |
| $\Omega_m h^2$              | 0.14123  | $0.1413^{+0.0024}_{-0.0023}$    | $D_M(z_*)/\text{Gpc}$ | 13.920   | $13.921^{+0.070}_{-0.073}$      | $f\sigma_8(0.61)$  | 0.4622   | $0.462^{+0.010}_{-0.010}$    |
| $\Omega_m h^3$              | 0.09590  | $0.0959^{+0.0015}_{-0.0014}$    | $z_{drag}$            | 1060.51  | $1060.5^{+1.6}_{-1.6}$          | $\sigma_8(0.61)$   | 0.5855   | $0.5853^{+0.0099}_{-0.010}$  |
| $\sigma_8$                  | 0.8010   | $0.801^{+0.015}_{-0.015}$       | $r_{drag}$            | 147.30   | $147.30^{+0.82}_{-0.83}$        | $f\sigma_8(2.33)$  | 0.2954   | $0.2953^{+0.0050}_{-0.0052}$ |
| $S_8$                       | 0.8093   | $0.810^{+0.029}_{-0.028}$       | $k_D$                 | 0.14089  | $0.1409^{+0.0013}_{-0.0013}$    | $\sigma_8(2.33)$   | 0.3048   | $0.3047^{+0.0053}_{-0.0054}$ |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4433   | $0.443^{+0.016}_{-0.015}$       | $100\theta_D$         | 0.16019  | $0.1602^{+0.0010}_{-0.00096}$   | $\chi^2_{lensing}$ | 8.37     | 9.1 ( $\nu$ : 0.6)           |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5959   | $0.596^{+0.015}_{-0.015}$       | $z_{eq}$              | 3360     | $3360^{+57}_{-55}$              | $\chi^2_{small}$   | 395.66   | 396.7 ( $\nu$ : 1.0)         |
| $\sigma_8/h^{0.5}$          | 0.9720   | $0.972^{+0.022}_{-0.022}$       | $k_{eq}$              | 0.010254 | $0.01026^{+0.00017}_{-0.00017}$ | $\chi^2_{CamSpec}$ | 1888.5   | 1891.7 ( $\nu$ : 4.0)        |
| $r_{drag} h$                | 100.02   | $99.98^{+1.9}_{-1.9}$           | $100\theta_{eq}$      | 0.8208   | $0.821^{+0.010}_{-0.010}$       | $\chi^2_{6DF}$     | 0.0098   | 0.049 ( $\nu$ : 0.0)         |
| $\langle d^2 \rangle^{1/2}$ | 2.416    | $2.415^{+0.059}_{-0.058}$       | $100\theta_{s,eq}$    | 0.4530   | $0.4530^{+0.0052}_{-0.0053}$    | $\chi^2_{MGS}$     | 1.41     | 1.46 ( $\nu$ : 0.1)          |
| $z_{re}$                    | 7.12     | $7.0^{+1.6}_{-1.6}$             | $H(0.15)$             | 73.12    | $73.1^{+1.1}_{-1.1}$            | $\chi^2_{DR12BAO}$ | 4.12     | 4.8 ( $\nu$ : 1.1)           |
| $10^9 A_s$                  | 2.092    | $2.090^{+0.062}_{-0.063}$       | $D_M(0.15)$           | 638.8    | $639^{+11}_{-11}$               | $\chi^2_{prior}$   | 10.99    | 12.5 ( $\nu$ : 2.4)          |
| $10^9 A_s e^{-2\tau}$       | 1.8935   | $1.895^{+0.030}_{-0.029}$       | $H(0.38)$             | 83.14    | $83.12^{+0.90}_{-0.85}$         | $\chi^2_{CMB}$     | 2292.6   | 2297.5 ( $\nu$ : 5.7)        |
| $D_{40}$                    | 1237     | $1237^{+53}_{-51}$              | $D_M(0.38)$           | 1524.8   | $1525^{+22}_{-22}$              | $\chi^2_{BAO}$     | 5.53     | 6.3 ( $\nu$ : 0.7)           |
| $D_{220}$                   | 5829     | $5829^{+170}_{-170}$            | $H(0.51)$             | 89.79    | $89.78^{+0.79}_{-0.74}$         |                    |          |                              |
| $D_{810}$                   | 2561.5   | $2563^{+43}_{-42}$              | $D_M(0.51)$           | 1976.0   | $1977^{+26}_{-26}$              |                    |          |                              |

Best-fit  $\chi^2_{eff} = 2309.08$ ;  $\bar{\chi}^2_{eff} = 2316.30$ ;  $R - 1 = 0.00893$

$\chi^2_{eff}$ : BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 4.12 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.37 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.66 CamSpec like\_10.7HM\_1400\_unified: 1888.53



### 2.31 base\_CamSpecHM\_TE\_lowE\_lensing\_CookeDH

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022406 | $0.02242^{+0.00045}_{-0.00046}$ | $D_{220}$             | 5730     | $5729^{+120}_{-120}$            | $H(0.38)$          | 83.35    | $83.40^{+0.91}_{-0.92}$      |
| $\Omega_c h^2$              | 0.11806  | $0.1180^{+0.0032}_{-0.0031}$    | $D_{810}$             | 2554.0   | $2554^{+42}_{-42}$              | $D_M(0.38)$        | 1519.6   | $1519^{+25}_{-24}$           |
| $100\theta_{MC}$            | 1.04126  | $1.04129^{+0.00094}_{-0.0010}$  | $D_{1420}$            | 825.6    | $826^{+20}_{-21}$               | $H(0.51)$          | 89.99    | $90.03^{+0.74}_{-0.74}$      |
| $\tau$                      | 0.0521   | $0.053^{+0.016}_{-0.015}$       | $D_{2000}$            | 233.6    | $233.7^{+7.5}_{-7.7}$           | $D_M(0.51)$        | 1969.8   | $1969^{+29}_{-28}$           |
| $\ln(10^{10} A_s)$          | 3.0398   | $3.041^{+0.032}_{-0.030}$       | $n_{s,0.002}$         | 0.9752   | $0.976^{+0.021}_{-0.022}$       | $H(0.61)$          | 95.55    | $95.58^{+0.62}_{-0.61}$      |
| $n_s$                       | 0.9752   | $0.976^{+0.021}_{-0.022}$       | $Y_P$                 | 0.245410 | $0.24541^{+0.00017}_{-0.00019}$ | $D_M(0.61)$        | 2293.2   | $2292^{+31}_{-30}$           |
| $y_{cal}$                   | 1.00019  | $1.0002^{+0.0049}_{-0.0048}$    | $Y_P^{BBN}$           | 0.246736 | $0.24674^{+0.00017}_{-0.00019}$ | $H(2.33)$          | 235.35   | $235.3^{+2.0}_{-1.9}$        |
| $H_0$                       | 68.19    | $68.2^{+1.4}_{-1.4}$            | $10^5 D/H$            | 2.579    | $2.578^{+0.086}_{-0.081}$       | $D_M(2.33)$        | 5753.0   | $5752^{+29}_{-29}$           |
| $\Omega_\Lambda$            | 0.6965   | $0.697^{+0.018}_{-0.019}$       | Age/Gyr               | 13.775   | $13.773^{+0.066}_{-0.065}$      | $f\sigma_8(0.15)$  | 0.4493   | $0.449^{+0.016}_{-0.016}$    |
| $\Omega_m$                  | 0.3035   | $0.303^{+0.019}_{-0.018}$       | $z_*$                 | 1089.70  | $1089.68^{+0.73}_{-0.70}$       | $\sigma_8(0.15)$   | 0.7457   | $0.746^{+0.013}_{-0.013}$    |
| $\Omega_m h^2$              | 0.14111  | $0.1410^{+0.0031}_{-0.0029}$    | $r_*$                 | 144.91   | $144.93^{+0.76}_{-0.76}$        | $f\sigma_8(0.38)$  | 0.4693   | $0.469^{+0.013}_{-0.013}$    |
| $\Omega_m h^3$              | 0.09622  | $0.09623^{+0.00097}_{-0.00095}$ | $100\theta_*$         | 1.04144  | $1.04147^{+0.00093}_{-0.00099}$ | $\sigma_8(0.38)$   | 0.6619   | $0.662^{+0.011}_{-0.011}$    |
| $\sigma_8$                  | 0.8061   | $0.806^{+0.014}_{-0.014}$       | $D_M(z_*)/\text{Gpc}$ | 13.914   | $13.916^{+0.071}_{-0.072}$      | $f\sigma_8(0.51)$  | 0.4689   | $0.469^{+0.011}_{-0.011}$    |
| $S_8$                       | 0.8108   | $0.810^{+0.032}_{-0.031}$       | $z_{drag}$            | 1059.89  | $1059.90^{+0.95}_{-0.99}$       | $\sigma_8(0.51)$   | 0.6198   | $0.620^{+0.011}_{-0.010}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4441   | $0.444^{+0.017}_{-0.017}$       | $r_{drag}$            | 147.57   | $147.58^{+0.79}_{-0.79}$        | $f\sigma_8(0.61)$  | 0.4646   | $0.4644^{+0.0099}_{-0.010}$  |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5983   | $0.598^{+0.015}_{-0.015}$       | $k_D$                 | 0.14039  | $0.14038^{+0.00096}_{-0.00095}$ | $\sigma_8(0.61)$   | 0.5899   | $0.590^{+0.011}_{-0.010}$    |
| $\sigma_8/h^{0.5}$          | 0.9762   | $0.976^{+0.021}_{-0.022}$       | $100\theta_D$         | 0.16082  | $0.16082^{+0.00059}_{-0.00056}$ | $f\sigma_8(2.33)$  | 0.2978   | $0.2979^{+0.0055}_{-0.0052}$ |
| $r_{drag} h$                | 100.62   | $100.7^{+2.5}_{-2.5}$           | $z_{eq}$              | 3357     | $3354^{+73}_{-70}$              | $\sigma_8(2.33)$   | 0.3074   | $0.3076^{+0.0060}_{-0.0057}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.400    | $2.399^{+0.067}_{-0.063}$       | $k_{eq}$              | 0.010245 | $0.01024^{+0.00022}_{-0.00022}$ | $\chi^2_{lensing}$ | 9.01     | $9.7 (\nu: 0.8)$             |
| $z_{re}$                    | 7.41     | $7.5^{+1.6}_{-1.6}$             | $100\theta_{eq}$      | 0.8219   | $0.822^{+0.014}_{-0.014}$       | $\chi^2_{small}$   | 395.72   | $396.8 (\nu: 1.1)$           |
| $10^9 A_s$                  | 2.090    | $2.092^{+0.068}_{-0.062}$       | $100\theta_{s,eq}$    | 0.4539   | $0.4541^{+0.0070}_{-0.0071}$    | $\chi^2_{CamSpec}$ | 2576.4   | $2580.6 (\nu: 4.3)$          |
| $10^9 A_s e^{-2\tau}$       | 1.8833   | $1.883^{+0.027}_{-0.026}$       | $H(0.15)$             | 73.38    | $73.4^{+1.2}_{-1.2}$            | $\chi^2_{prior}$   | 10.20    | $11.4 (\nu: 1.1)$            |
| $D_{40}$                    | 1211     | $1210^{+52}_{-50}$              | $D_M(0.15)$           | 636.4    | $636^{+12}_{-12}$               | $\chi^2_{CMB}$     | 2981.1   | $2987.1 (\nu: 6.3)$          |

Best-fit  $\chi^2_{eff} = 2991.29$ ;  $\bar{\chi}^2_{eff} = 2998.52$ ;  $R - 1 = 0.00490$

$\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 9.01 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.72 CamSpec like\_10.7HM\_1400\_unified: 2576.36



## 2.32 base\_CamSpecHM\_EE\_lowE\_lensing\_CookeDH

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02249  | $0.02251^{+0.00083}_{-0.00085}$ | $D_{220}$             | 5810     | $5809^{+180}_{-180}$            | $H(0.38)$          | 82.69    | $82.7^{+1.4}_{-1.3}$         |
| $\Omega_c h^2$              | 0.11913  | $0.1191^{+0.0040}_{-0.0040}$    | $D_{810}$             | 2556.5   | $2558^{+45}_{-44}$              | $D_M(0.38)$        | 1536.6   | $1536^{+36}_{-35}$           |
| $100\theta_{MC}$            | 1.03932  | $1.0394^{+0.0016}_{-0.0015}$    | $D_{1420}$            | 822.4    | $823^{+22}_{-22}$               | $H(0.51)$          | 89.43    | $89.5^{+1.2}_{-1.1}$         |
| $\tau$                      | 0.0479   | $0.047^{+0.016}_{-0.017}$       | $D_{2000}$            | 232.2    | $232.5^{+8.0}_{-7.9}$           | $D_M(0.51)$        | 1990.0   | $1989^{+43}_{-42}$           |
| $\ln(10^{10} A_s)$          | 3.0378   | $3.036^{+0.030}_{-0.032}$       | $n_{s,0.002}$         | 0.9637   | $0.965^{+0.021}_{-0.021}$       | $H(0.61)$          | 95.06    | $95.1^{+1.0}_{-0.95}$        |
| $n_s$                       | 0.9637   | $0.965^{+0.021}_{-0.021}$       | $Y_P$                 | 0.245443 | $0.24545^{+0.00036}_{-0.00038}$ | $D_M(0.61)$        | 2315.2   | $2314^{+46}_{-45}$           |
| $y_{cal}$                   | 0.99982  | $0.9998^{+0.0050}_{-0.0049}$    | $Y_P^{BBN}$           | 0.246769 | $0.24677^{+0.00036}_{-0.00038}$ | $H(2.33)$          | 235.96   | $236.0^{+2.2}_{-2.2}$        |
| $H_0$                       | 67.23    | $67.3^{+2.0}_{-2.0}$            | $10^5 D/H$            | 2.563    | $2.56^{+0.16}_{-0.15}$          | $D_M(2.33)$        | 5776.8   | $5776^{+49}_{-49}$           |
| $\Omega_\Lambda$            | 0.6852   | $0.685^{+0.025}_{-0.027}$       | Age/Gyr               | 13.829   | $13.83^{+0.11}_{-0.11}$         | $f\sigma_8(0.15)$  | 0.4550   | $0.454^{+0.022}_{-0.022}$    |
| $\Omega_m$                  | 0.3148   | $0.315^{+0.027}_{-0.025}$       | $z_*$                 | 1089.69  | $1089.7^{+1.3}_{-1.2}$          | $\sigma_8(0.15)$   | 0.7420   | $0.741^{+0.013}_{-0.013}$    |
| $\Omega_m h^2$              | 0.14227  | $0.1422^{+0.0035}_{-0.0035}$    | $r_*$                 | 144.56   | $144.56^{+0.81}_{-0.78}$        | $f\sigma_8(0.38)$  | 0.4724   | $0.472^{+0.017}_{-0.017}$    |
| $\Omega_m h^3$              | 0.09565  | $0.0957^{+0.0015}_{-0.0015}$    | $100\theta_*$         | 1.03950  | $1.0395^{+0.0016}_{-0.0015}$    | $\sigma_8(0.38)$   | 0.6573   | $0.657^{+0.011}_{-0.011}$    |
| $\sigma_8$                  | 0.8033   | $0.802^{+0.015}_{-0.015}$       | $D_M(z_*)/\text{Gpc}$ | 13.907   | $13.907^{+0.081}_{-0.079}$      | $f\sigma_8(0.51)$  | 0.4706   | $0.470^{+0.014}_{-0.014}$    |
| $S_8$                       | 0.8228   | $0.822^{+0.044}_{-0.043}$       | $z_{drag}$            | 1060.16  | $1060.2^{+1.7}_{-1.8}$          | $\sigma_8(0.51)$   | 0.6150   | $0.614^{+0.011}_{-0.011}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4507   | $0.450^{+0.024}_{-0.023}$       | $r_{drag}$            | 147.18   | $147.18^{+0.87}_{-0.84}$        | $f\sigma_8(0.61)$  | 0.4655   | $0.465^{+0.012}_{-0.012}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.6017   | $0.601^{+0.020}_{-0.020}$       | $k_D$                 | 0.14086  | $0.1409^{+0.0012}_{-0.0013}$    | $\sigma_8(0.61)$   | 0.5851   | $0.585^{+0.010}_{-0.010}$    |
| $\sigma_8/h^{0.5}$          | 0.9797   | $0.979^{+0.028}_{-0.028}$       | $100\theta_D$         | 0.16037  | $0.1604^{+0.0011}_{-0.0010}$    | $f\sigma_8(2.33)$  | 0.2949   | $0.2947^{+0.0053}_{-0.0053}$ |
| $r_{drag} h$                | 98.95    | $99.0^{+3.2}_{-3.1}$            | $z_{eq}$              | 3384     | $3384^{+84}_{-84}$              | $\sigma_8(2.33)$   | 0.3039   | $0.3037^{+0.0059}_{-0.0059}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.435    | $2.430^{+0.070}_{-0.070}$       | $k_{eq}$              | 0.010329 | $0.01033^{+0.00026}_{-0.00026}$ | $\chi^2_{lensing}$ | 8.77     | 9.6 ( $\nu: 1.2$ )           |
| $z_{re}$                    | 6.98     | $6.8^{+1.7}_{-1.8}$             | $100\theta_{eq}$      | 0.8156   | $0.816^{+0.017}_{-0.016}$       | $\chi^2_{small}$   | 395.72   | 396.8 ( $\nu: 1.2$ )         |
| $10^9 A_s$                  | 2.086    | $2.082^{+0.064}_{-0.065}$       | $100\theta_{s,eq}$    | 0.4505   | $0.4506^{+0.0084}_{-0.0081}$    | $\chi^2_{CamSpec}$ | 1888.2   | 1891.6 ( $\nu: 3.8$ )        |
| $10^9 A_s e^{-2\tau}$       | 1.8953   | $1.896^{+0.029}_{-0.029}$       | $H(0.15)$             | 72.54    | $72.6^{+1.8}_{-1.8}$            | $\chi^2_{prior}$   | 10.38    | 12.2 ( $\nu: 2.1$ )          |
| $D_{40}$                    | 1243     | $1241^{+53}_{-51}$              | $D_M(0.15)$           | 644.6    | $644^{+18}_{-17}$               | $\chi^2_{CMB}$     | 2292.7   | 2298.0 ( $\nu: 5.4$ )        |

Best-fit  $\chi^2_{eff} = 2303.11$ ;  $\bar{\chi}^2_{eff} = 2310.16$ ;  $R - 1 = 0.00957$

$\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.77 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.72 CamSpec like\_10.7HM\_1400\_unified: 1888.23



### 2.33 base\_CamSpecHM\_TT\_lowl

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.02253  | $0.02242^{+0.00054}_{-0.00054}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4693   | $0.468^{+0.027}_{-0.027}$       | $100\theta_{s,eq}$          | 0.4563   | $0.455^{+0.011}_{-0.011}$ |
| $\Omega_c h^2$              | 0.1169   | $0.1177^{+0.0052}_{-0.0050}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6359   | $0.631^{+0.030}_{-0.032}$       | $H(0.15)$                   | 73.84    | $73.5^{+2.1}_{-2.0}$      |
| $100\theta_{MC}$            | 1.04132  | $1.0412^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$          | 1.039    | $1.030^{+0.049}_{-0.052}$       | $D_M(0.15)$                 | 631.9    | $635^{+20}_{-19}$         |
| $\tau$                      | 0.128    | $0.113^{+0.063}_{-0.069}$       | $r_{drag} h$                | 101.52   | $100.9^{+4.1}_{-4.1}$           | $H(0.38)$                   | 83.69    | $83.4^{+1.5}_{-1.5}$      |
| $\ln(10^{10} A_s)$          | 3.183    | $3.15^{+0.12}_{-0.13}$          | $\langle d^2 \rangle^{1/2}$ | 2.560    | $2.54^{+0.11}_{-0.12}$          | $D_M(0.38)$                 | 1510.7   | $1518^{+40}_{-39}$        |
| $n_s$                       | 0.9775   | $0.973^{+0.016}_{-0.016}$       | $z_{re}$                    | 14.0     | $12.7^{+4.9}_{-5.4}$            | $H(0.51)$                   | 90.26    | $90.1^{+1.2}_{-1.2}$      |
| $y_{cal}$                   | 1.00018  | $1.0003^{+0.0048}_{-0.0048}$    | $10^9 A_s$                  | 2.411    | $2.35^{+0.29}_{-0.29}$          | $D_M(0.51)$                 | 1959.3   | $1967^{+47}_{-46}$        |
| $A_{100}^{PS}$              | 219      | $233^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8656   | $1.868^{+0.030}_{-0.030}$       | $H(0.61)$                   | 95.76    | $95.60^{+0.99}_{-0.92}$   |
| $A_{143}^{PS}$              | 45.0     | $36^{+20}_{-20}$                | $D_{40}$                    | 1234.6   | $1237^{+32}_{-31}$              | $D_M(0.61)$                 | 2282     | $2291^{+51}_{-50}$        |
| $A_{217}^{PS}$              | 109.7    | $104^{+30}_{-30}$               | $D_{220}$                   | 5706     | $5708^{+80}_{-81}$              | $H(2.33)$                   | 234.71   | $235.1^{+3.0}_{-2.9}$     |
| $A_{217}^{CIB}$             | 37.6     | $38^{+10}_{-10}$                | $D_{810}$                   | 2529.3   | $2528^{+27}_{-27}$              | $D_M(2.33)$                 | 5744.2   | $5752^{+41}_{-43}$        |
| $A_{143}^{tSZ}$             | 6.20     | $< 7.57$                        | $D_{1420}$                  | 817.0    | $815^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4754   | $0.473^{+0.026}_{-0.026}$ |
| $r_{143 \times 217}^{PS}$   | 0.807    | $0.67^{+0.26}_{-0.27}$          | $D_{2000}$                  | 232.68   | $231.6^{+4.2}_{-4.3}$           | $\sigma_8(0.15)$            | 0.7978   | $0.788^{+0.042}_{-0.045}$ |
| $r_{143 \times 217}^{CIB}$  | 0.70     | —                               | $n_{s,0.002}$               | 0.9775   | $0.973^{+0.016}_{-0.016}$       | $f\sigma_8(0.38)$           | 0.4984   | $0.495^{+0.024}_{-0.025}$ |
| $\xi^{tSZ \times CIB}$      | 0.96     | —                               | $Y_P$                       | 0.245453 | $0.24541^{+0.00022}_{-0.00023}$ | $\sigma_8(0.38)$            | 0.7089   | $0.700^{+0.039}_{-0.042}$ |
| $A^{kSZ}$                   | 0.1      | —                               | $Y_P^{BBN}$                 | 0.246780 | $0.24674^{+0.00022}_{-0.00023}$ | $f\sigma_8(0.51)$           | 0.4988   | $0.495^{+0.024}_{-0.025}$ |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.38}_{-0.39}$          | $10^5 D/H$                  | 2.557    | $2.58^{+0.10}_{-0.098}$         | $\sigma_8(0.51)$            | 0.6642   | $0.655^{+0.037}_{-0.040}$ |
| $A_{143}^{dust}$            | 0.962    | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | 13.756   | $13.773^{+0.092}_{-0.093}$      | $f\sigma_8(0.61)$           | 0.4948   | $0.490^{+0.024}_{-0.025}$ |
| $A_{217}^{dust}$            | 0.978    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.46  | $1089.7^{+1.0}_{-1.0}$          | $\sigma_8(0.61)$            | 0.6324   | $0.624^{+0.036}_{-0.039}$ |
| $A_{143 \times 217}^{dust}$ | 1.030    | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | 145.12   | $145.0^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | 0.3195   | $0.315^{+0.019}_{-0.020}$ |
| $c_{100}$                   | 0.99783  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04150  | $1.0414^{+0.0010}_{-0.0010}$    | $\sigma_8(2.33)$            | 0.3302   | $0.325^{+0.021}_{-0.022}$ |
| $c_{217}$                   | 1.00070  | $1.0009^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.934   | $13.922^{+0.098}_{-0.10}$       | $f_{2000}^{143}$            | 25.9     | $27^{+7}_{-7}$            |
| $H_0$                       | 68.72    | $68.3^{+2.4}_{-2.4}$            | $z_{drag}$                  | 1060.09  | $1059.9^{+1.0}_{-1.0}$          | $f_{2000}^{217}$            | 103.94   | $105.3^{+4.7}_{-4.7}$     |
| $\Omega_\Lambda$            | 0.7034   | $0.698^{+0.029}_{-0.032}$       | $r_{drag}$                  | 147.74   | $147.6^{+1.0}_{-1.1}$           | $f_{2000}^{143 \times 217}$ | 29.3     | $30^{+5}_{-5}$            |
| $\Omega_m$                  | 0.2966   | $0.302^{+0.032}_{-0.029}$       | $k_D$                       | 0.14030  | $0.1403^{+0.0011}_{-0.0010}$    | $\chi_{lowl}^2$             | 24.50    | $24.8 (\nu: 1.4)$         |
| $\Omega_m h^2$              | 0.14008  | $0.1408^{+0.0048}_{-0.0046}$    | $100\theta_D$               | 0.16071  | $0.16081^{+0.00059}_{-0.00057}$ | $\chi_{CamSpec}^2$          | 7046.4   | $7060.1 (\nu: 15.0)$      |
| $\Omega_m h^3$              | 0.09626  | $0.09616^{+0.00097}_{-0.00092}$ | $z_{eq}$                    | 3332     | $3349^{+110}_{-110}$            | $\chi_{prior}^2$            | 1.4      | $7.4 (\nu: 5.6)$          |
| $\sigma_8$                  | 0.8616   | $0.851^{+0.044}_{-0.048}$       | $k_{eq}$                    | 0.010170 | $0.01022^{+0.00035}_{-0.00034}$ | $\chi_{CMB}^2$              | 7070.9   | $7084.8 (\nu: 14.5)$      |
| $S_8$                       | 0.8568   | $0.854^{+0.050}_{-0.049}$       | $100\theta_{eq}$            | 0.8268   | $0.824^{+0.022}_{-0.022}$       |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7072.29$ ;  $\bar{\chi}_{eff}^2 = 7092.24$ ;  $R - 1 = 0.00797$

$\chi_{eff}^2$ : CMB - commander\_dx12\_v3\_2\_29: 24.50 CamSpec like\_10.7HM: 7046.38



### 2.34 base\_CamSpecHM\_TTTEE\_lowl

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022467 | $0.02243^{+0.00038}_{-0.00035}$ | $S_8$                       | 0.8498   | $0.846^{+0.041}_{-0.041}$       | $100\theta_{s,eq}$          | 0.4533   | $0.4530^{+0.0068}_{-0.0067}$ |
| $\Omega_c h^2$              | 0.11820  | $0.1184^{+0.0031}_{-0.0030}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4655   | $0.463^{+0.022}_{-0.022}$       | $H(0.15)$                   | 73.32    | $73.2^{+1.2}_{-1.2}$         |
| $100\theta_{MC}$            | 1.04104  | $1.04102^{+0.00064}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6265   | $0.623^{+0.029}_{-0.029}$       | $D_M(0.15)$                 | 637.0    | $638^{+12}_{-12}$            |
| $\tau$                      | 0.101    | $0.094^{+0.055}_{-0.057}$       | $\sigma_8/h^{0.5}$          | 1.0219   | $1.015^{+0.047}_{-0.048}$       | $H(0.38)$                   | 83.31    | $83.25^{+0.93}_{-0.88}$      |
| $\ln(10^{10} A_s)$          | 3.132    | $3.12^{+0.11}_{-0.11}$          | $r_{drag} h$                | 100.44   | $100.3^{+2.5}_{-2.4}$           | $D_M(0.38)$                 | 1520.8   | $1523^{+24}_{-24}$           |
| $n_s$                       | 0.9723   | $0.971^{+0.011}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$ | 2.521    | $2.51^{+0.11}_{-0.11}$          | $H(0.51)$                   | 89.96    | $89.91^{+0.74}_{-0.70}$      |
| $y_{cal}$                   | 1.00023  | $1.0002^{+0.0049}_{-0.0047}$    | $z_{re}$                    | 11.89    | $11.2^{+4.6}_{-5.0}$            | $D_M(0.51)$                 | 1971.2   | $1973^{+28}_{-29}$           |
| $A_{100}^{PS}$              | 221.6    | $234^{+50}_{-50}$               | $10^9 A_s$                  | 2.293    | $2.26^{+0.25}_{-0.24}$          | $H(0.61)$                   | 95.53    | $95.48^{+0.60}_{-0.56}$      |
| $A_{143}^{PS}$              | 48.3     | $37^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8726   | $1.872^{+0.024}_{-0.023}$       | $D_M(0.61)$                 | 2294.6   | $2297^{+30}_{-31}$           |
| $A_{217}^{PS}$              | 108.5    | $104^{+30}_{-30}$               | $D_{40}$                    | 1231.7   | $1233^{+28}_{-26}$              | $H(2.33)$                   | 235.48   | $235.6^{+1.8}_{-1.8}$        |
| $A_{217}^{CIB}$             | 38.8     | $38^{+10}_{-10}$                | $D_{220}$                   | 5716     | $5716^{+74}_{-73}$              | $D_M(2.33)$                 | 5753.6   | $5756^{+26}_{-27}$           |
| $A_{143}^{tSZ}$             | 6.38     | $< 7.53$                        | $D_{810}$                   | 2532.6   | $2531^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4708   | $0.468^{+0.022}_{-0.022}$    |
| $r_{143 \times 217}^{PS}$   | 0.768    | $0.67^{+0.26}_{-0.26}$          | $D_{1420}$                  | 816.9    | $815.5^{+9.4}_{-9.2}$           | $\sigma_8(0.15)$            | 0.7800   | $0.774^{+0.039}_{-0.040}$    |
| $r_{143 \times 217}^{CIB}$  | 0.84     | —                               | $D_{2000}$                  | 231.94   | $231.3^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | 0.4915   | $0.489^{+0.022}_{-0.023}$    |
| $\xi^{tSZ \times CIB}$      | 0.96     | —                               | $n_{s,0.002}$               | 0.9723   | $0.971^{+0.011}_{-0.010}$       | $\sigma_8(0.38)$            | 0.6922   | $0.687^{+0.036}_{-0.036}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P$                       | 0.245433 | $0.24542^{+0.00014}_{-0.00014}$ | $f\sigma_8(0.51)$           | 0.4909   | $0.488^{+0.023}_{-0.023}$    |
| $A_{100}^{dust}$            | 1.000    | $1.00^{+0.39}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246759 | $0.24674^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | 0.6481   | $0.643^{+0.034}_{-0.034}$    |
| $A_{143}^{dust}$            | 0.960    | $0.95^{+0.34}_{-0.35}$          | $10^5 D/H$                  | 2.568    | $2.575^{+0.066}_{-0.067}$       | $f\sigma_8(0.61)$           | 0.4863   | $0.483^{+0.022}_{-0.023}$    |
| $A_{217}^{dust}$            | 0.993    | $0.98^{+0.20}_{-0.20}$          | $Age/Gyr$                   | 13.776   | $13.781^{+0.057}_{-0.059}$      | $\sigma_8(0.61)$            | 0.6169   | $0.612^{+0.033}_{-0.033}$    |
| $A_{143 \times 217}^{dust}$ | 1.008    | $1.01^{+0.32}_{-0.32}$          | $z_*$                       | 1089.64  | $1089.70^{+0.64}_{-0.66}$       | $f\sigma_8(2.33)$           | 0.3114   | $0.309^{+0.017}_{-0.017}$    |
| $c_{100}$                   | 0.99782  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                       | 144.82   | $144.81^{+0.66}_{-0.66}$        | $\sigma_8(2.33)$            | 0.3213   | $0.319^{+0.018}_{-0.018}$    |
| $c_{217}$                   | 1.00104  | $1.0009^{+0.0032}_{-0.0031}$    | $100\theta_*$               | 1.04122  | $1.04120^{+0.00063}_{-0.00064}$ | $f_{2000}^{143}$            | 27.4     | $28^{+6}_{-6}$               |
| $c_{TE}$                    | 0.9932   | $0.994^{+0.011}_{-0.010}$       | $D_M(z_*)/Gpc$              | 13.909   | $13.908^{+0.061}_{-0.061}$      | $f_{2000}^{217}$            | 104.79   | $105.5^{+4.2}_{-4.2}$        |
| $c_{EE}$                    | 0.9906   | $0.9907^{+0.0097}_{-0.0097}$    | $z_{drag}$                  | 1060.05  | $1059.96^{+0.74}_{-0.67}$       | $f_{2000}^{143 \times 217}$ | 30.07    | $31^{+4}_{-5}$               |
| $H_0$                       | 68.11    | $68.0^{+1.4}_{-1.4}$            | $r_{drag}$                  | 147.46   | $147.46^{+0.65}_{-0.63}$        | $\chi_{lowl}^2$             | 23.92    | $24.1 (\nu: 0.9)$            |
| $\Omega_\Lambda$            | 0.6954   | $0.694^{+0.018}_{-0.019}$       | $k_D$                       | 0.14055  | $0.14053^{+0.00066}_{-0.00068}$ | $\chi_{CamSpec}^2$          | 11496.2  | $11512.2 (\nu: 16.0)$        |
| $\Omega_m$                  | 0.3046   | $0.306^{+0.019}_{-0.018}$       | $100\theta_D$               | 0.160702 | $0.16075^{+0.00040}_{-0.00041}$ | $\chi_{prior}^2$            | 1.9      | $7.8 (\nu: 5.7)$             |
| $\Omega_m h^2$              | 0.14131  | $0.1415^{+0.0029}_{-0.0028}$    | $z_{eq}$                    | 3361     | $3365^{+69}_{-68}$              | $\chi_{CMB}^2$              | 11520.1  | $11536.3 (\nu: 15.7)$        |
| $\Omega_m h^3$              | 0.09625  | $0.09620^{+0.00062}_{-0.00063}$ | $k_{eq}$                    | 0.010259 | $0.01027^{+0.00021}_{-0.00021}$ |                             |          |                              |
| $\sigma_8$                  | 0.8434   | $0.837^{+0.042}_{-0.042}$       | $100\theta_{eq}$            | 0.8210   | $0.820^{+0.013}_{-0.013}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11522.05$ ;  $\bar{\chi}_{eff}^2 = 11544.10$ ;  $R - 1 = 0.00836$

$\chi_{eff}^2$ : CMB - commander\_dx12\_v3\_2\_29: 23.92 CamSpec like\_10.7HM\_1400\_unified: 11496.23



### 2.35 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022129 | $0.02215^{+0.00040}_{-0.00039}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6087   | $0.609^{+0.015}_{-0.015}$       | $D_M(0.15)$                 | 646.2    | $646^{+12}_{-12}$            |
| $\Omega_c h^2$              | 0.12025  | $0.1203^{+0.0030}_{-0.0031}$    | $\sigma_8/h^{0.5}$          | 0.9897   | $0.990^{+0.021}_{-0.021}$       | $H(0.38)$                   | 82.61    | $82.63^{+0.87}_{-0.85}$      |
| $100\theta_{MC}$            | 1.04085  | $1.04085^{+0.00089}_{-0.00089}$ | $r_{drag}h$                 | 98.75    | $98.8^{+2.4}_{-2.3}$            | $D_M(0.38)$                 | 1539.4   | $1539^{+24}_{-24}$           |
| $\tau$                      | 0.0525   | $0.053^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | 2.4456   | $2.446^{+0.049}_{-0.049}$       | $H(0.51)$                   | 89.39    | $89.41^{+0.71}_{-0.68}$      |
| $\ln(10^{10} A_s)$          | 3.0388   | $3.039^{+0.030}_{-0.029}$       | $z_{re}$                    | 7.55     | $7.5^{+1.5}_{-1.6}$             | $D_M(0.51)$                 | 1993.1   | $1993^{+28}_{-28}$           |
| $n_s$                       | 0.9638   | $0.9639^{+0.0096}_{-0.0095}$    | $10^9 A_s$                  | 2.088    | $2.090^{+0.064}_{-0.060}$       | $H(0.61)$                   | 95.06    | $95.08^{+0.58}_{-0.56}$      |
| $y_{cal}$                   | 1.00036  | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8799   | $1.880^{+0.022}_{-0.022}$       | $D_M(0.61)$                 | 2318.4   | $2318^{+30}_{-30}$           |
| $A_{100}^{PS}$              | 242.2    | $243^{+50}_{-50}$               | $D_{40}$                    | 1228.9   | $1229^{+25}_{-25}$              | $H(2.33)$                   | 236.48   | $236.5^{+1.8}_{-1.9}$        |
| $A_{143}^{PS}$              | 39.7     | $41^{+20}_{-20}$                | $D_{220}$                   | 5704     | $5706^{+82}_{-81}$              | $D_M(2.33)$                 | 5775.5   | $5775^{+27}_{-28}$           |
| $A_{217}^{PS}$              | 99.6     | $101^{+30}_{-30}$               | $D_{810}$                   | 2532.9   | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4612   | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{CIB}$             | 44.4     | $41^{+10}_{-10}$                | $D_{1420}$                  | 813.7    | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.7482   | $0.748^{+0.011}_{-0.011}$    |
| $A_{143}^{tSZ}$             | 5.12     | $< 7.42$                        | $D_{2000}$                  | 229.35   | $229.5^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | 0.4780   | $0.478^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | 0.571    | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9638   | $0.9639^{+0.0096}_{-0.0095}$    | $\sigma_8(0.38)$            | 0.6625   | $0.6626^{+0.0099}_{-0.0096}$ |
| $r_{143 \times 217}^{CIB}$  | 0.71     | —                               | $Y_P$                       | 0.245296 | $0.24530^{+0.00016}_{-0.00019}$ | $f\sigma_8(0.51)$           | 0.4758   | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | 0.06     | —                               | $Y_P^{BBN}$                 | 0.246622 | $0.24663^{+0.00016}_{-0.00019}$ | $\sigma_8(0.51)$            | 0.6197   | $0.6198^{+0.0094}_{-0.0089}$ |
| $A^{kSZ}$                   | 2.5      | —                               | $10^5 D/H$                  | 2.632    | $2.628^{+0.076}_{-0.074}$       | $f\sigma_8(0.61)$           | 0.4703   | $0.4704^{+0.0094}_{-0.0096}$ |
| $A_{100}^{dust}$            | 1.011    | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                     | 13.825   | $13.823^{+0.062}_{-0.063}$      | $\sigma_8(0.61)$            | 0.5895   | $0.5896^{+0.0090}_{-0.0086}$ |
| $A_{143}^{dust}$            | 0.989    | $0.98^{+0.35}_{-0.34}$          | $z_*$                       | 1090.25  | $1090.23^{+0.67}_{-0.67}$       | $f\sigma_8(2.33)$           | 0.29694  | $0.2970^{+0.0047}_{-0.0045}$ |
| $A_{217}^{dust}$            | 0.962    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.55   | $144.54^{+0.71}_{-0.70}$        | $\sigma_8(2.33)$            | 0.3058   | $0.3059^{+0.0052}_{-0.0049}$ |
| $A_{143 \times 217}^{dust}$ | 1.008    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04106  | $1.04105^{+0.00087}_{-0.00087}$ | $f_{2000}^{143}$            | 31.4     | $31^{+6}_{-6}$               |
| $c_{100}$                   | 0.99746  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.885   | $13.884^{+0.066}_{-0.066}$      | $f_{2000}^{217}$            | 107.78   | $107.6^{+4.0}_{-4.0}$        |
| $c_{217}$                   | 1.00134  | $1.0012^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | 1059.40  | $1059.44^{+0.84}_{-0.88}$       | $f_{2000}^{143 \times 217}$ | 33.18    | $33^{+4}_{-4}$               |
| $H_0$                       | 67.04    | $67.1^{+1.4}_{-1.4}$            | $r_{drag}$                  | 147.29   | $147.27^{+0.72}_{-0.73}$        | $\chi^2_{lensing}$          | 8.91     | $9.52 (\nu: 0.4)$            |
| $\Omega_\Lambda$            | 0.6818   | $0.682^{+0.019}_{-0.019}$       | $k_D$                       | 0.14047  | $0.14050^{+0.00086}_{-0.00086}$ | $\chi^2_{small}$            | 395.87   | $396.9 (\nu: 1.3)$           |
| $\Omega_m$                  | 0.3182   | $0.318^{+0.019}_{-0.019}$       | $100\theta_D$               | 0.16108  | $0.16105^{+0.00051}_{-0.00049}$ | $\chi^2_{lowl}$             | 23.42    | $23.5 (\nu: 0.5)$            |
| $\Omega_m h^2$              | 0.14303  | $0.1431^{+0.0029}_{-0.0029}$    | $z_{eq}$                    | 3403     | $3403^{+69}_{-69}$              | $\chi^2_{CamSpec}$          | 7050.2   | $7062.7 (\nu: 13.0)$         |
| $\Omega_m h^3$              | 0.09589  | $0.09592^{+0.00086}_{-0.00084}$ | $k_{eq}$                    | 0.010385 | $0.01039^{+0.00021}_{-0.00021}$ | $\chi^2_{prior}$            | 2.3      | $7.6 (\nu: 6.0)$             |
| $\sigma_8$                  | 0.8104   | $0.811^{+0.013}_{-0.013}$       | $100\theta_{eq}$            | 0.8125   | $0.813^{+0.013}_{-0.013}$       | $\chi^2_{CMB}$              | 7478.4   | $7492.6 (\nu: 14.3)$         |
| $S_8$                       | 0.8346   | $0.835^{+0.032}_{-0.032}$       | $100\theta_{s,eq}$          | 0.4492   | $0.4491^{+0.0067}_{-0.0065}$    |                             |          |                              |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4571   | $0.457^{+0.018}_{-0.017}$       | $H(0.15)$                   | 72.39    | $72.4^{+1.2}_{-1.2}$            |                             |          |                              |

Best-fit  $\chi^2_{eff} = 7480.67$ ;  $\bar{\chi}^2_{eff} = 7500.24$ ;  $R - 1 = 0.00500$   
 $\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 8.91 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 commander\_dx12\_v3.2\_29: 23.42 CamSpec like\_10.7HM: 7050.18



## 2.36 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02222^{+0.00037}_{-0.00037}$ | $\sigma_8/h^{0.5}$                 | $0.984^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.38)$      | $1530^{+17}_{-17}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1191^{+0.0022}_{-0.0021}$    | $r_{\mathrm{drag}} h$              | $99.7^{+1.6}_{-1.7}$            | $H(0.51)$                   | $89.65^{+0.54}_{-0.53}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04102^{+0.00081}_{-0.00082}$ | $\langle d^2 \rangle^{1/2}$        | $2.433^{+0.042}_{-0.042}$       | $D_{\mathrm{M}}(0.51)$      | $1983^{+20}_{-20}$           |
| $\tau$                                   | $0.055^{+0.015}_{-0.014}$       | $z_{\mathrm{re}}$                  | $7.8^{+1.5}_{-1.5}$             | $H(0.61)$                   | $95.26^{+0.46}_{-0.45}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.043^{+0.030}_{-0.029}$       | $10^9 A_{\mathrm{s}}$              | $2.097^{+0.064}_{-0.059}$       | $D_{\mathrm{M}}(0.61)$      | $2307^{+22}_{-22}$           |
| $n_{\mathrm{s}}$                         | $0.9665^{+0.0081}_{-0.0081}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.877^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.4}$        |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0050}_{-0.0048}$    | $D_{40}$                           | $1225^{+24}_{-23}$              | $D_{\mathrm{M}}(2.33)$      | $5767^{+23}_{-23}$           |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{220}$                          | $5714^{+80}_{-78}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                          | $2534^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                         | $815.1^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.474^{+0.010}_{-0.0099}$   |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{2000}$                         | $229.9^{+3.5}_{-3.4}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0098}$   |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $n_{\mathrm{s},0.002}$             | $0.9665^{+0.0081}_{-0.0081}$    | $f\sigma_8(0.51)$           | $0.4729^{+0.0090}_{-0.0091}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                   | $0.24533^{+0.00015}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6202^{+0.0096}_{-0.0093}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24666^{+0.00015}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.4679^{+0.0084}_{-0.0084}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.614^{+0.071}_{-0.068}$       | $\sigma_8(0.61)$            | $0.5902^{+0.0092}_{-0.0088}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.806^{+0.053}_{-0.053}$      | $f\sigma_8(2.33)$           | $0.2976^{+0.0048}_{-0.0044}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.40}$          | $z_*$                              | $1090.03^{+0.56}_{-0.56}$       | $\sigma_8(2.33)$            | $0.3068^{+0.0051}_{-0.0047}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.34}$          | $r_*$                              | $144.77^{+0.55}_{-0.56}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                      | $1.04122^{+0.00080}_{-0.00082}$ | $f_{2000}^{217}$            | $107.4^{+4.1}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.903^{+0.055}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\mathrm{drag}}$                | $1059.53^{+0.82}_{-0.86}$       | $\chi_{\mathrm{lensing}}^2$ | $9.39 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                | $147.48^{+0.62}_{-0.61}$        | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 1.8)$           |
| $H_0$                                    | $67.57^{+0.97}_{-0.97}$         | $k_{\mathrm{D}}$                   | $0.14034^{+0.00081}_{-0.00081}$ | $\chi_{\mathrm{lowl}}^2$    | $23.04 (\nu: 0.4)$           |
| $\Omega_{\Lambda}$                       | $0.689^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{D}}$           | $0.16101^{+0.00049}_{-0.00049}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.1 (\nu: 13.4)$         |
| $\Omega_{\mathrm{m}}$                    | $0.311^{+0.013}_{-0.013}$       | $z_{\mathrm{eq}}$                  | $3378^{+50}_{-49}$              | $\chi_{6\mathrm{DF}}^2$     | $0.059 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                | $0.1420^{+0.0021}_{-0.0021}$    | $k_{\mathrm{eq}}$                  | $0.01031^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{MGS}}^2$     | $1.28 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.09595^{+0.00086}_{-0.00082}$ | $100\theta_{\mathrm{eq}}$          | $0.8173^{+0.0093}_{-0.0092}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.2)$             |
| $\sigma_8$                               | $0.809^{+0.013}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4516^{+0.0048}_{-0.0047}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.0)$             |
| $S_8$                                    | $0.824^{+0.024}_{-0.023}$       | $H(0.15)$                          | $72.84^{+0.85}_{-0.84}$         | $\chi_{\mathrm{CMB}}^2$     | $7492.7 (\nu: 14.3)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.451^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$             | $641.7^{+8.4}_{-8.3}$           | $\chi_{\mathrm{BAO}}^2$     | $6.2 (\nu: 0.8)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                          | $82.94^{+0.65}_{-0.63}$         |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7506.48; R - 1 = 0.00781$



### 2.37 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_Riess18

| Parameter  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                                 | $0.02233^{+0.00035}_{-0.00039}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.015}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $637^{+12}_{-11}$            |
| $\Omega_{\mathrm{c}}h^2$                                 | $0.1182^{+0.0031}_{-0.0029}$    | $\sigma_8/h^{0.5}$                   | $0.979^{+0.021}_{-0.023}$       | $H(0.38)$                   | $83.27^{+0.87}_{-0.91}$      |
| $100\theta_{\mathrm{MC}}$                                | $1.04121^{+0.00088}_{-0.00087}$ | $r_{\mathrm{drag}}h$                 | $100.5^{+2.3}_{-2.5}$           | $D_{\mathrm{M}}(0.38)$      | $1522^{+25}_{-23}$           |
| $\tau$   | $0.058^{+0.018}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$          | $2.422^{+0.048}_{-0.051}$       | $H(0.51)$                   | $89.91^{+0.71}_{-0.72}$      |
| $\ln(10^{10}A_{\mathrm{s}})$                             | $3.047^{+0.031}_{-0.029}$       | $z_{\mathrm{re}}$                    | $8.0^{+1.6}_{-1.5}$             | $D_{\mathrm{M}}(0.51)$      | $1972^{+29}_{-27}$           |
| $n_{\mathrm{s}}$   | $0.969^{+0.010}_{-0.0094}$      | $10^9 A_{\mathrm{s}}$                | $2.106^{+0.066}_{-0.061}$       | $H(0.61)$                   | $95.48^{+0.60}_{-0.58}$      |
| $y_{\mathrm{cal}}$                                       | $1.0008^{+0.0048}_{-0.0046}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.873^{+0.023}_{-0.024}$       | $D_{\mathrm{M}}(0.61)$      | $2296^{+31}_{-29}$           |
| $A_{100}^{\mathrm{PS}}$                                  | $241^{+50}_{-50}$               | $D_{40}$                             | $1221^{+24}_{-26}$              | $H(2.33)$                   | $235.3^{+1.8}_{-1.8}$        |
| $A_{143}^{\mathrm{PS}}$                                  | $40^{+20}_{-20}$                | $D_{220}$                            | $5724^{+80}_{-78}$              | $D_{\mathrm{M}}(2.33)$      | $5757^{+27}_{-27}$           |
| $A_{217}^{\mathrm{PS}}$                                  | $102^{+30}_{-30}$               | $D_{810}$                            | $2535^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.451^{+0.015}_{-0.017}$    |
| $A_{217}^{\mathrm{CIB}}$                                 | $40^{+10}_{-10}$                | $D_{1420}$                           | $816.4^{+9.9}_{-9.8}$           | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                                 | $< 7.42$                        | $D_{2000}$                           | $230.5^{+3.4}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.471^{+0.012}_{-0.014}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$                       | $0.66^{+0.24}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.969^{+0.010}_{-0.0094}$      | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0098}$   |
| $r_{143 \times 217}^{\mathrm{CIB}}$                      | —                               | $Y_{\mathrm{P}}$                     | $0.24538^{+0.00014}_{-0.00016}$ | $f\sigma_8(0.51)$           | $0.470^{+0.010}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$                 | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00014}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6207^{+0.0095}_{-0.0094}$ |
| $A^{\mathrm{kSZ}}$                                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.593^{+0.071}_{-0.067}$       | $f\sigma_8(0.61)$           | $0.4657^{+0.0094}_{-0.011}$  |
| $A_{100}^{\mathrm{dust}}$                                | $1.02^{+0.38}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.785^{+0.060}_{-0.060}$      | $\sigma_8(0.61)$            | $0.5908^{+0.0094}_{-0.0090}$ |
| $A_{143}^{\mathrm{dust}}$                                | $0.97^{+0.35}_{-0.33}$          | $z_*$                                | $1089.81^{+0.63}_{-0.59}$       | $f\sigma_8(2.33)$           | $0.2982^{+0.0050}_{-0.0046}$ |
| $A_{217}^{\mathrm{dust}}$                                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                | $144.94^{+0.71}_{-0.75}$        | $\sigma_8(2.33)$            | $0.3077^{+0.0058}_{-0.0050}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$                     | $1.03^{+0.31}_{-0.30}$          | $100\theta_*$                        | $1.04140^{+0.00087}_{-0.00087}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.918^{+0.073}_{-0.066}$      | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.72^{+0.81}_{-0.83}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$  | $68.1^{+1.3}_{-1.4}$            | $r_{\mathrm{drag}}$                  | $147.62^{+0.76}_{-0.77}$        | $\chi_{\mathrm{lensing}}^2$ | $9.8 (\nu: 1.0)$             |
| $\Omega_{\Lambda}$                                       | $0.695^{+0.017}_{-0.019}$       | $k_{\mathrm{D}}$                     | $0.14028^{+0.00086}_{-0.00095}$ | $\chi_{\mathrm{simall}}^2$  | $397.8 (\nu: 3.4)$           |
| $\Omega_{\mathrm{m}}$                                    | $0.305^{+0.019}_{-0.017}$       | $100\theta_{\mathrm{D}}$             | $0.16092^{+0.00050}_{-0.00047}$ | $\chi_{\mathrm{lowl}}^2$    | $22.68 (\nu: 0.4)$           |
| $\Omega_{\mathrm{m}}h^2$                                 | $0.1411^{+0.0030}_{-0.0028}$    | $z_{\mathrm{eq}}$                    | $3357^{+72}_{-66}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7064.4 (\nu: 15.2)$         |
| $\Omega_{\mathrm{m}}h^3$                                 | $0.09607^{+0.00082}_{-0.00083}$ | $k_{\mathrm{eq}}$                    | $0.01025^{+0.00022}_{-0.00020}$ | $\chi_{\mathrm{H073p45}}^2$ | $10.7 (\nu: 3.6)$            |
| $\sigma_8$   | $0.808^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{eq}}$            | $0.822^{+0.013}_{-0.014}$       | $\chi_{\mathrm{prior}}^2$   | $7.4 (\nu: 5.9)$             |
| $S_8$  | $0.814^{+0.030}_{-0.035}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4537^{+0.0065}_{-0.0071}$    | $\chi_{\mathrm{CMB}}^2$     | $7494.8 (\nu: 19.7)$         |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$                      | $0.446^{+0.017}_{-0.019}$       | $H(0.15)$                            | $73.3^{+1.2}_{-1.2}$            |                             |                              |
| $\bar{\chi}_{\mathrm{eff}}^2 = 7512.86; R - 1 = 0.03322$ |                                 |                                      |                                 |                             |                              |



### 2.38 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Riess18

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02233^{+0.00034}_{-0.00037}$ | $\sigma_8/h^{0.5}$                 | $0.979^{+0.017}_{-0.018}$       | $D_{\mathrm{M}}(0.38)$      | $1522^{+16}_{-16}$           |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1182^{+0.0021}_{-0.0019}$    | $r_{\mathrm{drag}}h$               | $100.4^{+1.6}_{-1.6}$           | $H(0.51)$                   | $89.90^{+0.51}_{-0.51}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04119^{+0.00078}_{-0.00080}$ | $\langle d^2 \rangle^{1/2}$        | $2.423^{+0.043}_{-0.043}$       | $D_{\mathrm{M}}(0.51)$      | $1973^{+19}_{-18}$           |
| $\tau$                                   | $0.058^{+0.015}_{-0.014}$       | $z_{\mathrm{re}}$                  | $8.0^{+1.4}_{-1.4}$             | $H(0.61)$                   | $95.46^{+0.45}_{-0.44}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.047^{+0.030}_{-0.029}$       | $10^9 A_{\mathrm{s}}$              | $2.106^{+0.064}_{-0.061}$       | $D_{\mathrm{M}}(0.61)$      | $2297^{+21}_{-20}$           |
| $n_{\mathrm{s}}$                         | $0.9690^{+0.0078}_{-0.0081}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$    | $1.874^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.2}$        |
| $y_{\mathrm{cal}}$                       | $1.0008^{+0.0048}_{-0.0047}$    | $D_{40}$                           | $1222^{+23}_{-23}$              | $D_{\mathrm{M}}(2.33)$      | $5758^{+22}_{-22}$           |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{220}$                          | $5725^{+78}_{-79}$              | $f\sigma_8(0.15)$           | $0.451^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{810}$                          | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{1420}$                         | $816.5^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.4710^{+0.0098}_{-0.0098}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                         | $230.5^{+3.4}_{-3.4}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0099}$   |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $n_{\mathrm{s},0.002}$             | $0.9690^{+0.0078}_{-0.0081}$    | $f\sigma_8(0.51)$           | $0.4704^{+0.0088}_{-0.0090}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.24}_{-0.25}$          | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00014}_{-0.00015}$ | $\sigma_8(0.51)$            | $0.6208^{+0.0096}_{-0.0093}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24670^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.61)$           | $0.4659^{+0.0083}_{-0.0083}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.593^{+0.068}_{-0.066}$       | $\sigma_8(0.61)$            | $0.5909^{+0.0092}_{-0.0089}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.786^{+0.051}_{-0.050}$      | $f\sigma_8(2.33)$           | $0.2982^{+0.0047}_{-0.0045}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.39}_{-0.39}$          | $z_*$                              | $1089.81^{+0.54}_{-0.50}$       | $\sigma_8(2.33)$            | $0.3077^{+0.0050}_{-0.0048}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.33}$          | $r_*$                              | $144.92^{+0.53}_{-0.54}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$                      | $1.04138^{+0.00076}_{-0.00080}$ | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.917^{+0.054}_{-0.055}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0020}_{-0.0020}$    | $z_{\mathrm{drag}}$                | $1059.72^{+0.79}_{-0.81}$       | $\chi_{\mathrm{lensing}}^2$ | $9.6 (\nu: 0.6)$             |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                | $147.61^{+0.59}_{-0.61}$        | $\chi_{\mathrm{simall}}^2$  | $397.7 (\nu: 2.6)$           |
| $H_0$                                    | $68.04^{+0.91}_{-0.93}$         | $k_{\mathrm{D}}$                   | $0.14029^{+0.00079}_{-0.00080}$ | $\chi_{\mathrm{lowl}}^2$    | $22.69 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                       | $0.695^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{D}}$           | $0.16091^{+0.00051}_{-0.00047}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.2 (\nu: 14.4)$         |
| $\Omega_{\mathrm{m}}$                    | $0.305^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                  | $3359^{+48}_{-45}$              | $\chi_{\mathrm{H073p45}}^2$ | $10.7 (\nu: 1.7)$            |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1412^{+0.0020}_{-0.0019}$    | $k_{\mathrm{eq}}$                  | $0.01025^{+0.00015}_{-0.00014}$ | $\chi_{6\mathrm{DF}}^2$     | $0.027 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}h^3$                 | $0.09607^{+0.00082}_{-0.00083}$ | $100\theta_{\mathrm{eq}}$          | $0.8213^{+0.0083}_{-0.0088}$    | $\chi_{\mathrm{MGS}}^2$     | $1.73 (\nu: 0.1)$            |
| $\sigma_8$                               | $0.808^{+0.013}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4536^{+0.0043}_{-0.0046}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $3.91 (\nu: 0.3)$            |
| $S_8$                                    | $0.815^{+0.022}_{-0.022}$       | $H(0.15)$                          | $73.25^{+0.80}_{-0.81}$         | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 6.0)$             |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.446^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.15)$             | $637.6^{+7.9}_{-7.7}$           | $\chi_{\mathrm{CMB}}^2$     | $7494.2 (\nu: 15.8)$         |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$     | $0.600^{+0.012}_{-0.012}$       | $H(0.38)$                          | $83.25^{+0.61}_{-0.61}$         | $\chi_{\mathrm{BAO}}^2$     | $5.67 (\nu: 0.2)$            |

$\bar{\chi}_{\mathrm{eff}}^2 = 7518.00; R - 1 = 0.02714$



### 2.39 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022170 | $0.02218^{+0.00039}_{-0.00039}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6073   | $0.607^{+0.015}_{-0.014}$       | $D_M(0.15)$                 | 644.4    | $644^{+11}_{-11}$            |
| $\Omega_c h^2$              | 0.11983  | $0.1198^{+0.0028}_{-0.0028}$    | $\sigma_8/h^{0.5}$          | 0.9882   | $0.987^{+0.020}_{-0.020}$       | $H(0.38)$                   | 82.74    | $82.76^{+0.83}_{-0.80}$      |
| $100\theta_{MC}$            | 1.04091  | $1.04092^{+0.00086}_{-0.00086}$ | $r_{drag}h$                 | 99.09    | $99.1^{+2.2}_{-2.2}$            | $D_M(0.38)$                 | 1535.9   | $1535^{+22}_{-22}$           |
| $\tau$                      | 0.0541   | $0.054^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | 2.4421   | $2.441^{+0.048}_{-0.047}$       | $H(0.51)$                   | 89.49    | $89.51^{+0.67}_{-0.64}$      |
| $\ln(10^{10} A_s)$          | 3.0416   | $3.041^{+0.030}_{-0.029}$       | $z_{re}$                    | 7.70     | $7.7^{+1.5}_{-1.5}$             | $D_M(0.51)$                 | 1989.0   | $1988^{+26}_{-26}$           |
| $n_s$                       | 0.9650   | $0.9651^{+0.0091}_{-0.0089}$    | $10^9 A_s$                  | 2.094    | $2.093^{+0.064}_{-0.060}$       | $H(0.61)$                   | 95.14    | $95.16^{+0.56}_{-0.54}$      |
| $y_{cal}$                   | 1.00058  | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | 1.8792   | $1.879^{+0.022}_{-0.021}$       | $D_M(0.61)$                 | 2314.0   | $2313^{+28}_{-28}$           |
| $A_{100}^{PS}$              | 239.9    | $243^{+50}_{-50}$               | $D_{40}$                    | 1227.5   | $1228^{+25}_{-24}$              | $H(2.33)$                   | 236.25   | $236.2^{+1.7}_{-1.7}$        |
| $A_{143}^{PS}$              | 40.1     | $41^{+20}_{-20}$                | $D_{220}$                   | 5709     | $5710^{+82}_{-79}$              | $D_M(2.33)$                 | 5771.9   | $5771^{+26}_{-27}$           |
| $A_{217}^{PS}$              | 100.0    | $101^{+30}_{-30}$               | $D_{810}$                   | 2534.1   | $2534^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4594   | $0.459^{+0.015}_{-0.015}$    |
| $A_{217}^{CIB}$             | 45.1     | $41^{+10}_{-10}$                | $D_{1420}$                  | 814.6    | $815^{+10}_{-9.9}$              | $\sigma_8(0.15)$            | 0.7484   | $0.748^{+0.011}_{-0.011}$    |
| $A_{143}^{tSZ}$             | 5.90     | $< 7.42$                        | $D_{2000}$                  | 229.69   | $229.7^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | 0.4769   | $0.476^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{PS}$   | 0.569    | $0.65^{+0.24}_{-0.25}$          | $n_{s,0.002}$               | 0.9650   | $0.9651^{+0.0091}_{-0.0089}$    | $\sigma_8(0.38)$            | 0.6630   | $0.663^{+0.010}_{-0.0097}$   |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $Y_P$                       | 0.245314 | $0.24532^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.51)$           | 0.4750   | $0.475^{+0.010}_{-0.010}$    |
| $\xi^{tSZ \times CIB}$      | 0.07     | —                               | $Y_P^{BBN}$                 | 0.246640 | $0.24664^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | 0.6203   | $0.6200^{+0.0095}_{-0.0091}$ |
| $A^{kSZ}$                   | 1.3      | —                               | $10^5 D/H$                  | 2.624    | $2.621^{+0.075}_{-0.073}$       | $f\sigma_8(0.61)$           | 0.4697   | $0.4693^{+0.0092}_{-0.0094}$ |
| $A_{100}^{dust}$            | 1.012    | $1.01^{+0.39}_{-0.40}$          | Age/Gyr                     | 13.817   | $13.815^{+0.059}_{-0.060}$      | $\sigma_8(0.61)$            | 0.5901   | $0.5898^{+0.0091}_{-0.0087}$ |
| $A_{143}^{dust}$            | 0.991    | $0.98^{+0.35}_{-0.34}$          | $z_*$                       | 1090.16  | $1090.14^{+0.64}_{-0.65}$       | $f\sigma_8(2.33)$           | 0.29738  | $0.2973^{+0.0047}_{-0.0045}$ |
| $A_{217}^{dust}$            | 0.967    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.63   | $144.63^{+0.67}_{-0.66}$        | $\sigma_8(2.33)$            | 0.3064   | $0.3063^{+0.0052}_{-0.0049}$ |
| $A_{143 \times 217}^{dust}$ | 1.000    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04112  | $1.04112^{+0.00085}_{-0.00085}$ | $f_{2000}^{143}$            | 31.1     | $31^{+6}_{-6}$               |
| $c_{100}$                   | 0.99756  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/Gpc$              | 13.892   | $13.892^{+0.063}_{-0.063}$      | $f_{2000}^{217}$            | 107.63   | $107.5^{+4.0}_{-4.0}$        |
| $c_{217}$                   | 1.00139  | $1.0012^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | 1059.47  | $1059.48^{+0.83}_{-0.85}$       | $f_{2000}^{143 \times 217}$ | 32.95    | $33^{+4}_{-4}$               |
| $H_0$                       | 67.24    | $67.3^{+1.3}_{-1.3}$            | $r_{drag}$                  | 147.36   | $147.36^{+0.70}_{-0.69}$        | $\chi_{lensing}^2$          | 8.88     | $9.45 (\nu: 0.3)$            |
| $\Omega_\Lambda$            | 0.6845   | $0.685^{+0.017}_{-0.018}$       | $k_D$                       | 0.14043  | $0.14044^{+0.00084}_{-0.00084}$ | $\chi_{small}^2$            | 396.05   | $397.0 (\nu: 1.5)$           |
| $\Omega_m$                  | 0.3155   | $0.315^{+0.018}_{-0.017}$       | $100\theta_D$               | 0.161041 | $0.16103^{+0.00050}_{-0.00049}$ | $\chi_{lowl}^2$             | 23.24    | $23.30 (\nu: 0.5)$           |
| $\Omega_m h^2$              | 0.14265  | $0.1426^{+0.0026}_{-0.0027}$    | $z_{eq}$                    | 3393     | $3392^{+63}_{-64}$              | $\chi_{CamSpec}^2$          | 7050.4   | $7062.8 (\nu: 13.3)$         |
| $\Omega_m h^3$              | 0.09592  | $0.09594^{+0.00086}_{-0.00083}$ | $k_{eq}$                    | 0.010357 | $0.01035^{+0.00019}_{-0.00020}$ | $\chi_{JLA}^2$              | 1035.29  | $1035.43 (\nu: 0.2)$         |
| $\sigma_8$                  | 0.8104   | $0.810^{+0.013}_{-0.013}$       | $100\theta_{eq}$            | 0.8143   | $0.815^{+0.012}_{-0.012}$       | $\chi_{prior}^2$            | 2.2      | $7.6 (\nu: 6.0)$             |
| $S_8$                       | 0.8310   | $0.830^{+0.030}_{-0.029}$       | $100\theta_{s,eq}$          | 0.4501   | $0.4502^{+0.0063}_{-0.0060}$    | $\chi_{CMB}^2$              | 7478.5   | $7492.6 (\nu: 14.3)$         |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4552   | $0.455^{+0.016}_{-0.016}$       | $H(0.15)$                   | 72.56    | $72.6^{+1.1}_{-1.1}$            |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8516.03$ ;  $\bar{\chi}_{eff}^2 = 8535.63$ ;  $R - 1 = 0.00582$   
 $\chi_{eff}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consect8: 8.88 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.05 commander\_dx12\_v3.2\_29: 23.24 CamSpec like\_10.7HM: 7050.35 SN - JLA Pantheon18: 1035.29



## 2.40 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_JLA\_Riess18

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00037}_{-0.00037}$ | $r_{\text{drag}} h$         | $100.5^{+1.6}_{-1.6}$           | $D_M(0.51)$                 | $1972^{+19}_{-18}$           |
| $\Omega_c h^2$                       | $0.1181^{+0.0020}_{-0.0020}$    | $\langle d^2 \rangle^{1/2}$ | $2.421^{+0.041}_{-0.043}$       | $H(0.61)$                   | $95.48^{+0.45}_{-0.45}$      |
| $100\theta_{\text{MC}}$              | $1.04120^{+0.00079}_{-0.00081}$ | $z_{\text{re}}$             | $8.0^{+1.4}_{-1.5}$             | $D_M(0.61)$                 | $2296^{+21}_{-19}$           |
| $\tau$                               | $0.058^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.105^{+0.064}_{-0.062}$       | $H(2.33)$                   | $235.3^{+1.3}_{-1.3}$        |
| $\ln(10^{10} A_s)$                   | $3.047^{+0.030}_{-0.030}$       | $10^9 A_s e^{-2\tau}$       | $1.874^{+0.022}_{-0.021}$       | $D_M(2.33)$                 | $5757^{+22}_{-23}$           |
| $n_s$                                | $0.9692^{+0.0078}_{-0.0077}$    | $D_{40}$                    | $1221^{+23}_{-23}$              | $f\sigma_8(0.15)$           | $0.451^{+0.011}_{-0.011}$    |
| $y_{\text{cal}}$                     | $1.0008^{+0.0051}_{-0.0050}$    | $D_{220}$                   | $5726^{+79}_{-77}$              | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                   | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.4704^{+0.0096}_{-0.0098}$ |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{1420}$                  | $817^{+10}_{-9.9}$              | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{2000}$                  | $230.6^{+3.5}_{-3.6}$           | $f\sigma_8(0.51)$           | $0.4699^{+0.0087}_{-0.0089}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-20}$                | $n_{\text{s},0.002}$        | $0.9692^{+0.0078}_{-0.0077}$    | $\sigma_8(0.51)$            | $0.6206^{+0.0096}_{-0.0098}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.43$                        | $Y_{\text{P}}$              | $0.24538^{+0.00014}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.4655^{+0.0081}_{-0.0083}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24671^{+0.00014}_{-0.00016}$ | $\sigma_8(0.61)$            | $0.5908^{+0.0092}_{-0.0093}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D/H}$           | $2.592^{+0.070}_{-0.067}$       | $f\sigma_8(2.33)$           | $0.2982^{+0.0046}_{-0.0048}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age/Gyr}$            | $13.784^{+0.051}_{-0.052}$      | $\sigma_8(2.33)$            | $0.3077^{+0.0048}_{-0.0049}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1089.79^{+0.53}_{-0.54}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.36}_{-0.39}$          | $r_*$                       | $144.95^{+0.53}_{-0.54}$        | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $100\theta_*$               | $1.04139^{+0.00077}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.919^{+0.053}_{-0.056}$      | $\chi_{\text{lensing}}^2$   | $9.7 (\nu: 0.7)$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.30}$          | $z_{\text{drag}}$           | $1059.73^{+0.78}_{-0.83}$       | $\chi_{\text{simall}}^2$    | $397.7 (\nu: 2.5)$           |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0019}$    | $r_{\text{drag}}$           | $147.63^{+0.61}_{-0.58}$        | $\chi_{\text{lowl}}^2$      | $22.66 (\nu: 0.3)$           |
| $c_{217}$                            | $1.0012^{+0.0033}_{-0.0030}$    | $k_{\text{D}}$              | $0.14027^{+0.00078}_{-0.00083}$ | $\chi_{\text{CamSpec}}^2$   | $7064.4 (\nu: 14.7)$         |
| $H_0$                                | $68.10^{+0.95}_{-0.93}$         | $100\theta_{\text{D}}$      | $0.16091^{+0.00052}_{-0.00049}$ | $\chi_{\text{H073p45}}^2$   | $10.5 (\nu: 1.7)$            |
| $\Omega_{\Lambda}$                   | $0.696^{+0.012}_{-0.012}$       | $z_{\text{eq}}$             | $3356^{+48}_{-44}$              | $\chi_{\text{JLA}}^2$       | $706.61 (\nu: 0.0)$          |
| $\Omega_{\text{m}}$                  | $0.304^{+0.012}_{-0.012}$       | $k_{\text{eq}}$             | $0.01024^{+0.00015}_{-0.00014}$ | $\chi_{6\text{DF}}^2$       | $0.026 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^2$              | $0.1411^{+0.0020}_{-0.0019}$    | $100\theta_{\text{eq}}$     | $0.8218^{+0.0091}_{-0.0086}$    | $\chi_{\text{MGS}}^2$       | $1.79 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^3$              | $0.09607^{+0.00084}_{-0.00084}$ | $100\theta_{\text{s,eq}}$   | $0.4538^{+0.0045}_{-0.0045}$    | $\chi_{\text{DR12BAO}}^2$   | $3.85 (\nu: 0.3)$            |
| $\sigma_8$                           | $0.807^{+0.013}_{-0.013}$       | $H(0.15)$                   | $73.30^{+0.81}_{-0.81}$         | $\chi_{\text{prior}}^2$     | $7.5 (\nu: 6.3)$             |
| $S_8$                                | $0.813^{+0.022}_{-0.022}$       | $D_M(0.15)$                 | $637.2^{+7.9}_{-7.9}$           | $\chi_{\text{CMB}}^2$       | $7494.5 (\nu: 16.4)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.445^{+0.012}_{-0.012}$       | $H(0.38)$                   | $83.28^{+0.60}_{-0.62}$         | $\chi_{\text{BAO}}^2$       | $5.67 (\nu: 0.2)$            |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.600^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1521^{+16}_{-16}$              |                             |                              |
| $\sigma_8/h^{0.5}$                   | $0.979^{+0.017}_{-0.018}$       | $H(0.51)$                   | $89.92^{+0.51}_{-0.52}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8224.73; R - 1 = 0.08459$$



## 2.41 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022236 | $0.02224^{+0.00037}_{-0.00036}$ | $\sigma_8/h^{0.5}$          | 0.9832   | $0.983^{+0.018}_{-0.017}$       | $D_M(0.38)$                 | 1529.2   | $1529^{+16}_{-16}$           |
| $\Omega_c h^2$                       | 0.11903  | $0.1190^{+0.0021}_{-0.0021}$    | $r_{\text{drag}} h$         | 99.76    | $99.8^{+1.6}_{-1.6}$            | $H(0.51)$                   | 89.68    | $89.68^{+0.52}_{-0.51}$      |
| $100\theta_{\text{MC}}$              | 1.04107  | $1.04104^{+0.00080}_{-0.00082}$ | $\langle d^2 \rangle^{1/2}$ | 2.4301   | $2.432^{+0.042}_{-0.042}$       | $D_M(0.51)$                 | 1981.2   | $1981^{+19}_{-19}$           |
| $\tau$                               | 0.0552   | $0.056^{+0.015}_{-0.015}$       | $z_{\text{re}}$             | 7.79     | $7.8^{+1.5}_{-1.5}$             | $H(0.61)$                   | 95.290   | $95.29^{+0.45}_{-0.44}$      |
| $\ln(10^{10} A_s)$                   | 3.0426   | $3.044^{+0.030}_{-0.029}$       | $10^9 A_s$                  | 2.096    | $2.098^{+0.064}_{-0.060}$       | $D_M(0.61)$                 | 2305.5   | $2306^{+21}_{-21}$           |
| $n_s$                                | 0.9671   | $0.9669^{+0.0080}_{-0.0081}$    | $10^9 A_s e^{-2\tau}$       | 1.8768   | $1.876^{+0.021}_{-0.020}$       | $H(2.33)$                   | 235.80   | $235.8^{+1.4}_{-1.3}$        |
| $y_{\text{cal}}$                     | 1.00072  | $1.0007^{+0.0050}_{-0.0048}$    | $D_{40}$                    | 1223.7   | $1224^{+24}_{-23}$              | $D_M(2.33)$                 | 5765.2   | $5765^{+23}_{-23}$           |
| $A_{100}^{\text{PS}}$                | 237.4    | $242^{+50}_{-50}$               | $D_{220}$                   | 5715     | $5716^{+80}_{-78}$              | $f\sigma_8(0.15)$           | 0.4551   | $0.455^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | 40.1     | $41^{+20}_{-20}$                | $D_{810}$                   | 2535.2   | $2534^{+26}_{-26}$              | $\sigma_8(0.15)$            | 0.7473   | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | 100.8    | $101^{+30}_{-30}$               | $D_{1420}$                  | 815.7    | $815.3^{+9.8}_{-9.8}$           | $f\sigma_8(0.38)$           | 0.4736   | $0.4737^{+0.0098}_{-0.0099}$ |
| $A_{217}^{\text{CIB}}$               | 45.8     | $41^{+10}_{-10}$                | $D_{2000}$                  | 230.13   | $230.0^{+3.4}_{-3.4}$           | $\sigma_8(0.38)$            | 0.6626   | $0.663^{+0.010}_{-0.0098}$   |
| $A_{143}^{\text{tSZ}}$               | 6.62     | $< 7.42$                        | $n_{s,0.002}$               | 0.9671   | $0.9669^{+0.0080}_{-0.0081}$    | $f\sigma_8(0.51)$           | 0.4724   | $0.4724^{+0.0088}_{-0.0089}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.572    | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}$              | 0.245341 | $0.24534^{+0.00015}_{-0.00016}$ | $\sigma_8(0.51)$            | 0.6201   | $0.6203^{+0.0097}_{-0.0093}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.80     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.246667 | $0.24666^{+0.00015}_{-0.00016}$ | $f\sigma_8(0.61)$           | 0.4675   | $0.4676^{+0.0082}_{-0.0083}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.04     | —                               | $10^5 D/H$                  | 2.611    | $2.612^{+0.070}_{-0.068}$       | $\sigma_8(0.61)$            | 0.5901   | $0.5903^{+0.0092}_{-0.0088}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | Age/Gyr                     | 13.802   | $13.803^{+0.052}_{-0.052}$      | $f\sigma_8(2.33)$           | 0.29759  | $0.2977^{+0.0048}_{-0.0045}$ |
| $A_{100}^{\text{dust}}$              | 1.007    | $1.01^{+0.39}_{-0.39}$          | $z_*$                       | 1090.00  | $1090.00^{+0.54}_{-0.55}$       | $\sigma_8(2.33)$            | 0.30686  | $0.3069^{+0.0050}_{-0.0047}$ |
| $A_{143}^{\text{dust}}$              | 0.988    | $0.97^{+0.35}_{-0.34}$          | $r_*$                       | 144.79   | $144.80^{+0.55}_{-0.55}$        | $f_{2000}^{143}$            | 30.8     | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.965    | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | 1.04127  | $1.04124^{+0.00080}_{-0.00081}$ | $f_{2000}^{217}$            | 107.35   | $107.3^{+4.1}_{-4.0}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 1.000    | $1.03^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | 13.905   | $13.906^{+0.053}_{-0.054}$      | $f_{2000}^{143 \times 217}$ | 32.66    | $33^{+4}_{-4}$               |
| $c_{100}$                            | 0.99763  | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.55  | $1059.55^{+0.84}_{-0.84}$       | $\chi_{\text{lensing}}^2$   | 9.02     | $9.41 (\nu: 0.4)$            |
| $c_{217}$                            | 1.00136  | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | 147.50   | $147.51^{+0.60}_{-0.60}$        | $\chi_{\text{small}}^2$     | 396.23   | $397.3 (\nu: 1.9)$           |
| $H_0$                                | 67.64    | $67.64^{+0.93}_{-0.93}$         | $k_{\text{D}}$              | 0.14034  | $0.14032^{+0.00081}_{-0.00080}$ | $\chi_{\text{lowl}}^2$      | 22.86    | $22.98 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                   | 0.6898   | $0.690^{+0.012}_{-0.013}$       | $100\theta_{\text{D}}$      | 0.160998 | $0.16100^{+0.00050}_{-0.00048}$ | $\chi_{\text{CamSpec}}^2$   | 7051.2   | $7063.2 (\nu: 13.5)$         |
| $\Omega_{\text{m}}$                  | 0.3102   | $0.310^{+0.013}_{-0.012}$       | $z_{\text{eq}}$             | 3375.7   | $3375^{+49}_{-48}$              | $\chi_{\text{JLA}}^2$       | 1034.99  | $1035.07 (\nu: 0.0)$         |
| $\Omega_{\text{m}} h^2$              | 0.14191  | $0.1419^{+0.0021}_{-0.0020}$    | $k_{\text{eq}}$             | 0.010303 | $0.01030^{+0.00015}_{-0.00014}$ | $\chi_{6\text{DF}}^2$       | 0.022    | $0.048 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^3$              | 0.09598  | $0.09596^{+0.00085}_{-0.00082}$ | $100\theta_{\text{eq}}$     | 0.8178   | $0.8180^{+0.0090}_{-0.0088}$    | $\chi_{\text{MGS}}^2$       | 1.28     | $1.35 (\nu: 0.1)$            |
| $\sigma_8$                           | 0.8086   | $0.809^{+0.013}_{-0.012}$       | $100\theta_{s,\text{eq}}$   | 0.45183  | $0.4519^{+0.0046}_{-0.0046}$    | $\chi_{\text{DR12BAO}}^2$   | 4.18     | $4.6 (\nu: 0.9)$             |
| $S_8$                                | 0.8223   | $0.822^{+0.023}_{-0.023}$       | $H(0.15)$                   | 72.90    | $72.90^{+0.81}_{-0.80}$         | $\chi_{\text{prior}}^2$     | 2.1      | $7.6 (\nu: 6.0)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | 0.4504   | $0.450^{+0.013}_{-0.012}$       | $D_M(0.15)$                 | 641.1    | $641.1^{+8.0}_{-7.9}$           | $\chi_{\text{CMB}}^2$       | 7479.3   | $7492.9 (\nu: 14.5)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | 0.6035   | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                   | 82.98    | $82.98^{+0.62}_{-0.61}$         | $\chi_{\text{BAO}}^2$       | 5.48     | $6.0 (\nu: 0.6)$             |

Best-fit  $\chi_{\text{eff}}^2 = 8521.87$ ;  $\bar{\chi}_{\text{eff}}^2 = 8541.50$ ;  $R - 1 = 0.00920$

$\chi_{\text{eff}}^2$ : BAO - 6DF: 0.02 MGS: 1.28 DR12BAO: 4.18 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 9.02 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.23 commander\_dx12.v3.2.29: 22.86 CamSpec like\_10.7HM: 7051.17 SN - JLA Pantheon18: 1034.99



## 2.42 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_Riess18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022336 | $0.02234^{+0.00034}_{-0.00037}$ | $r_{\text{drag}} h$         | 100.44   | $100.5^{+1.5}_{-1.5}$           | $D_M(0.51)$                 | 1972.8   | $1972^{+18}_{-18}$           |
| $\Omega_c h^2$                       | 0.11821  | $0.1181^{+0.0020}_{-0.0019}$    | $\langle d^2 \rangle^{1/2}$ | 2.4226   | $2.422^{+0.043}_{-0.043}$       | $H(0.61)$                   | 95.465   | $95.48^{+0.44}_{-0.43}$      |
| $100\theta_{\text{MC}}$              | 1.04119  | $1.04120^{+0.00077}_{-0.00080}$ | $z_{\text{re}}$             | 8.05     | $8.1^{+1.4}_{-1.4}$             | $D_M(0.61)$                 | 2296.4   | $2296^{+20}_{-19}$           |
| $\tau$                               | 0.0582   | $0.058^{+0.015}_{-0.014}$       | $10^9 A_s$                  | 2.106    | $2.106^{+0.064}_{-0.060}$       | $H(2.33)$                   | 235.37   | $235.3^{+1.3}_{-1.2}$        |
| $\ln(10^{10} A_s)$                   | 3.0473   | $3.047^{+0.030}_{-0.029}$       | $10^9 A_s e^{-2\tau}$       | 1.8744   | $1.874^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | 5757.3   | $5757^{+22}_{-22}$           |
| $n_s$                                | 0.9692   | $0.9692^{+0.0078}_{-0.0080}$    | $D_{40}$                    | 1221.3   | $1221^{+23}_{-23}$              | $f\sigma_8(0.15)$           | 0.4513   | $0.451^{+0.011}_{-0.011}$    |
| $y_{\text{cal}}$                     | 1.00087  | $1.0009^{+0.0048}_{-0.0047}$    | $D_{220}$                   | 5726     | $5726^{+78}_{-79}$              | $\sigma_8(0.15)$            | 0.7473   | $0.747^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | 235.2    | $241^{+50}_{-50}$               | $D_{810}$                   | 2536.3   | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | 0.4710   | $0.4707^{+0.0097}_{-0.0096}$ |
| $A_{143}^{\text{PS}}$                | 39.5     | $40^{+20}_{-20}$                | $D_{1420}$                  | 816.9    | $816.6^{+9.8}_{-9.8}$           | $\sigma_8(0.38)$            | 0.6632   | $0.663^{+0.010}_{-0.0098}$   |
| $A_{217}^{\text{PS}}$                | 101.5    | $102^{+30}_{-30}$               | $D_{2000}$                  | 230.67   | $230.6^{+3.4}_{-3.4}$           | $f\sigma_8(0.51)$           | 0.4704   | $0.4702^{+0.0087}_{-0.0089}$ |
| $A_{217}^{\text{CIB}}$               | 44.8     | $40^{+10}_{-10}$                | $n_{\text{s},0.002}$        | 0.9692   | $0.9692^{+0.0078}_{-0.0080}$    | $\sigma_8(0.51)$            | 0.6209   | $0.6208^{+0.0096}_{-0.0093}$ |
| $A_{143}^{\text{tSZ}}$               | 6.49     | $< 7.42$                        | $Y_{\text{P}}$              | 0.245382 | $0.24538^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.61)$           | 0.4660   | $0.4658^{+0.0082}_{-0.0082}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.590    | $0.66^{+0.24}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | 0.246708 | $0.24671^{+0.00014}_{-0.00015}$ | $\sigma_8(0.61)$            | 0.5910   | $0.5909^{+0.0092}_{-0.0088}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.78     | —                               | $10^5 D/H$                  | 2.592    | $2.592^{+0.068}_{-0.065}$       | $f\sigma_8(2.33)$           | 0.29826  | $0.2982^{+0.0047}_{-0.0045}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.09     | —                               | Age/Gyr                     | 13.7851  | $13.784^{+0.050}_{-0.049}$      | $\sigma_8(2.33)$            | 0.30778  | $0.3078^{+0.0050}_{-0.0048}$ |
| $A^{\text{kSZ}}$                     | 0.2      | —                               | $z_*$                       | 1089.81  | $1089.80^{+0.53}_{-0.49}$       | $f_{2000}^{143}$            | 30.1     | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | 1.007    | $1.02^{+0.39}_{-0.39}$          | $r_*$                       | 144.92   | $144.94^{+0.52}_{-0.54}$        | $f_{2000}^{217}$            | 107.00   | $107.0^{+4.2}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | 0.980    | $0.97^{+0.35}_{-0.33}$          | $100\theta_*$               | 1.04138  | $1.04139^{+0.00076}_{-0.00080}$ | $f_{2000}^{143 \times 217}$ | 32.22    | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | 0.968    | $0.97^{+0.21}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.916   | $13.918^{+0.053}_{-0.054}$      | $\chi_{\text{lensing}}^2$   | 9.17     | $9.6 (\nu: 0.6)$             |
| $A_{143 \times 217}^{\text{dust}}$   | 1.002    | $1.02^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | 1059.74  | $1059.73^{+0.78}_{-0.82}$       | $\chi_{\text{small}}^2$     | 396.83   | $397.7 (\nu: 2.6)$           |
| $c_{100}$                            | 0.99765  | $0.9976^{+0.0020}_{-0.0020}$    | $r_{\text{drag}}$           | 147.60   | $147.62^{+0.57}_{-0.60}$        | $\chi_{\text{lowl}}^2$      | 22.60    | $22.66 (\nu: 0.3)$           |
| $c_{217}$                            | 1.00136  | $1.0012^{+0.0031}_{-0.0030}$    | $k_{\text{D}}$              | 0.14030  | $0.14028^{+0.00078}_{-0.00081}$ | $\chi_{\text{CamSpec}}^2$   | 7052.0   | $7064.2 (\nu: 14.4)$         |
| $H_0$                                | 68.05    | $68.08^{+0.88}_{-0.89}$         | $100\theta_{\text{D}}$      | 0.160903 | $0.16091^{+0.00050}_{-0.00047}$ | $\chi_{\text{H073p45}}^2$   | 10.58    | $10.5 (\nu: 1.6)$            |
| $\Omega_{\Lambda}$                   | 0.6951   | $0.695^{+0.011}_{-0.012}$       | $z_{\text{eq}}$             | 3358.5   | $3357^{+47}_{-43}$              | $\chi_{\text{JLA}}^2$       | 1034.807 | $1034.87 (\nu: 0.0)$         |
| $\Omega_{\text{m}}$                  | 0.3049   | $0.305^{+0.012}_{-0.011}$       | $k_{\text{eq}}$             | 0.010251 | $0.01025^{+0.00014}_{-0.00013}$ | $\chi_{6\text{DF}}^2$       | 0.0001   | $0.025 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^2$              | 0.14119  | $0.1411^{+0.0020}_{-0.0018}$    | $100\theta_{\text{eq}}$     | 0.8213   | $0.8216^{+0.0080}_{-0.0085}$    | $\chi_{\text{MGS}}^2$       | 1.68     | $1.77 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^3$              | 0.09608  | $0.09607^{+0.00082}_{-0.00083}$ | $100\theta_{\text{s,eq}}$   | 0.45359  | $0.4538^{+0.0042}_{-0.0044}$    | $\chi_{\text{DR12BAO}}^2$   | 3.49     | $3.85 (\nu: 0.2)$            |
| $\sigma_8$                           | 0.8080   | $0.808^{+0.013}_{-0.012}$       | $H(0.15)$                   | 73.26    | $73.28^{+0.77}_{-0.77}$         | $\chi_{\text{prior}}^2$     | 2.1      | $7.5 (\nu: 6.0)$             |
| $S_8$                                | 0.8146   | $0.814^{+0.022}_{-0.021}$       | $D_M(0.15)$                 | 637.5    | $637.3^{+7.6}_{-7.4}$           | $\chi_{\text{CMB}}^2$       | 7480.6   | $7494.3 (\nu: 15.8)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | 0.4462   | $0.446^{+0.012}_{-0.012}$       | $H(0.38)$                   | 83.25    | $83.27^{+0.59}_{-0.59}$         | $\chi_{\text{BAO}}^2$       | 5.16     | $5.64 (\nu: 0.2)$            |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | 0.6004   | $0.600^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1522.1   | $1522^{+15}_{-15}$              |                             |          |                              |
| $\sigma_8/h^{0.5}$                   | 0.9795   | $0.979^{+0.017}_{-0.018}$       | $H(0.51)$                   | 89.90    | $89.91^{+0.50}_{-0.50}$         |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 8533.26$ ;  $\bar{\chi}_{\text{eff}}^2 = 8552.81$ ;  $R - 1 = 0.02978$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.68 DR12BAO: 3.49 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 9.17 small\_100x143.offlike5\_EE\_Aplanck\_B: 396.83 comman-  
der\_dx12\_v3\_2\_29: 22.60 CamSpec like\_10.7HM: 7051.98 Hubble - H073p45: 10.58 SN - JLA Pantheon18: 1034.81



## 2.43 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02216^{+0.00039}_{-0.00039}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $646^{+12}_{-12}$            |
| $\Omega_{\mathrm{c}}h^2$               | $0.1201^{+0.0030}_{-0.0030}$    | $\sigma_8/h^{0.5}$                   | $0.990^{+0.021}_{-0.021}$       | $H(0.38)$                   | $82.66^{+0.86}_{-0.83}$      |
| $100\theta_{\mathrm{MC}}$              | $1.04086^{+0.00089}_{-0.00088}$ | $r_{\mathrm{drag}}h$                 | $98.9^{+2.4}_{-2.3}$            | $D_{\mathrm{M}}(0.38)$      | $1538^{+23}_{-23}$           |
| $\tau$                                 | $0.054^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$          | $2.447^{+0.049}_{-0.048}$       | $H(0.51)$                   | $89.43^{+0.70}_{-0.67}$      |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.042^{+0.026}_{-0.024}$       | $z_{\mathrm{re}}$                    | $< 8.86$                        | $D_{\mathrm{M}}(0.51)$      | $1992^{+27}_{-27}$           |
| $n_{\mathrm{s}}$                       | $0.9643^{+0.0094}_{-0.0093}$    | $10^9 A_{\mathrm{s}}$                | $2.095^{+0.055}_{-0.050}$       | $H(0.61)$                   | $95.09^{+0.58}_{-0.55}$      |
| $y_{\mathrm{cal}}$                     | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.880^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(0.61)$      | $2317^{+29}_{-29}$           |
| $A_{100}^{\mathrm{PS}}$                | $243^{+50}_{-50}$               | $D_{40}$                             | $1229^{+25}_{-24}$              | $H(2.33)$                   | $236.4^{+1.8}_{-1.8}$        |
| $A_{143}^{\mathrm{PS}}$                | $41^{+20}_{-20}$                | $D_{220}$                            | $5706^{+82}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5774^{+27}_{-28}$           |
| $A_{217}^{\mathrm{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                            | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$               | $41^{+10}_{-10}$                | $D_{1420}$                           | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.749^{+0.011}_{-0.0099}$   |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.42$                        | $D_{2000}$                           | $229.5^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9643^{+0.0094}_{-0.0093}$    | $\sigma_8(0.38)$            | $0.6633^{+0.0090}_{-0.0085}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24530^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.51)$           | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24663^{+0.00016}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.6205^{+0.0084}_{-0.0078}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.627^{+0.075}_{-0.073}$       | $f\sigma_8(0.61)$           | $0.4706^{+0.0093}_{-0.0096}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.821^{+0.061}_{-0.062}$      | $\sigma_8(0.61)$            | $0.5902^{+0.0080}_{-0.0074}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $z_*$                                | $1090.21^{+0.66}_{-0.65}$       | $f\sigma_8(2.33)$           | $0.2974^{+0.0042}_{-0.0038}$ |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                                | $144.56^{+0.70}_{-0.69}$        | $\sigma_8(2.33)$            | $0.3063^{+0.0046}_{-0.0042}$ |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$                        | $1.04107^{+0.00087}_{-0.00087}$ | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.886^{+0.066}_{-0.065}$      | $f_{2000}^{217}$            | $107.6^{+4.0}_{-4.0}$        |
| $c_{217}$                              | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.45^{+0.83}_{-0.85}$       | $f_{2000}^{143\times 217}$  | $33^{+4}_{-4}$               |
| $H_0$                                  | $67.1^{+1.4}_{-1.3}$            | $r_{\mathrm{drag}}$                  | $147.29^{+0.72}_{-0.71}$        | $\chi_{\mathrm{lensing}}^2$ | $9.49\ (\nu: 0.4)$           |
| $\Omega_{\Lambda}$                     | $0.682^{+0.018}_{-0.019}$       | $k_{\mathrm{D}}$                     | $0.14049^{+0.00086}_{-0.00085}$ | $\chi_{\mathrm{simall}}^2$  | $396.8\ (\nu: 1.3)$          |
| $\Omega_{\mathrm{m}}$                  | $0.318^{+0.019}_{-0.018}$       | $100\theta_{\mathrm{D}}$             | $0.16105^{+0.00050}_{-0.00049}$ | $\chi_{\mathrm{lowl}}^2$    | $23.5\ (\nu: 0.5)$           |
| $\Omega_{\mathrm{m}}h^2$               | $0.1429^{+0.0028}_{-0.0028}$    | $z_{\mathrm{eq}}$                    | $3401^{+67}_{-68}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7062.6\ (\nu: 13.0)$        |
| $\Omega_{\mathrm{m}}h^3$               | $0.09593^{+0.00086}_{-0.00084}$ | $k_{\mathrm{eq}}$                    | $0.01038^{+0.00020}_{-0.00021}$ | $\chi_{\mathrm{prior}}^2$   | $7.6\ (\nu: 6.0)$            |
| $\sigma_8$                             | $0.811^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$            | $0.813^{+0.013}_{-0.012}$       | $\chi_{\mathrm{CMB}}^2$     | $7492.4\ (\nu: 13.9)$        |
| $S_8$                                  | $0.835^{+0.032}_{-0.032}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4494^{+0.0066}_{-0.0064}$    |                             |                              |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$    | $0.457^{+0.018}_{-0.017}$       | $H(0.15)$                            | $72.5^{+1.2}_{-1.1}$            |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7500.01$ ;  $R - 1 = 0.00502$



## 2.44 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|--------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02223^{+0.00037}_{-0.00037}$ | $\sigma_8/h^{0.5}$             | $0.985^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1530^{+17}_{-17}$           |
| $\Omega_{\text{c}} h^2$              | $0.1191^{+0.0022}_{-0.0021}$    | $r_{\text{drag}} h$            | $99.7^{+1.6}_{-1.6}$            | $H(0.51)$                   | $89.66^{+0.54}_{-0.52}$      |
| $100\theta_{\text{MC}}$              | $1.04102^{+0.00080}_{-0.00082}$ | $\langle d^2 \rangle^{1/2}$    | $2.434^{+0.042}_{-0.041}$       | $D_{\text{M}}(0.51)$        | $1982^{+20}_{-20}$           |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $z_{\text{re}}$                | $7.9^{+1.2}_{-1.3}$             | $H(0.61)$                   | $95.27^{+0.46}_{-0.45}$      |
| $\ln(10^{10} A_{\text{s}})$          | $3.044^{+0.027}_{-0.025}$       | $10^9 A_{\text{s}}$            | $2.100^{+0.058}_{-0.053}$       | $D_{\text{M}}(0.61)$        | $2307^{+21}_{-21}$           |
| $n_{\text{s}}$                       | $0.9667^{+0.0080}_{-0.0081}$    | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.877^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.8^{+1.4}_{-1.3}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0050}_{-0.0048}$    | $D_{40}$                       | $1225^{+24}_{-23}$              | $D_{\text{M}}(2.33)$        | $5766^{+23}_{-23}$           |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{220}$                      | $5714^{+80}_{-78}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{810}$                      | $2534^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.010}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                     | $815.1^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.4744^{+0.0099}_{-0.0099}$ |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{2000}$                     | $229.9^{+3.5}_{-3.4}$           | $\sigma_8(0.38)$            | $0.6631^{+0.0099}_{-0.0087}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.43$                        | $n_{\text{s},0.002}$           | $0.9667^{+0.0080}_{-0.0081}$    | $f\sigma_8(0.51)$           | $0.4731^{+0.0089}_{-0.0088}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $Y_{\text{P}}$                 | $0.24533^{+0.00015}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6206^{+0.0088}_{-0.0083}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$    | $0.24666^{+0.00015}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.4681^{+0.0082}_{-0.0081}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$       | $2.613^{+0.071}_{-0.068}$       | $\sigma_8(0.61)$            | $0.5905^{+0.0084}_{-0.0079}$ |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$        | $13.805^{+0.052}_{-0.052}$      | $f\sigma_8(2.33)$           | $0.2978^{+0.0043}_{-0.0040}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.40}$          | $z_*$                          | $1090.03^{+0.56}_{-0.55}$       | $\sigma_8(2.33)$            | $0.3070^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $r_*$                          | $144.77^{+0.55}_{-0.56}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                  | $1.04122^{+0.00079}_{-0.00081}$ | $f_{2000}^{217}$            | $107.4^{+4.1}_{-4.0}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.904^{+0.055}_{-0.055}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$              | $1059.54^{+0.82}_{-0.86}$       | $\chi_{\text{lensing}}^2$   | $9.35 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$              | $147.49^{+0.61}_{-0.61}$        | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.8)$           |
| $H_0$                                | $67.58^{+0.97}_{-0.96}$         | $k_{\text{D}}$                 | $0.14034^{+0.00081}_{-0.00081}$ | $\chi_{\text{lowl}}^2$      | $23.04 (\nu: 0.4)$           |
| $\Omega_{\Lambda}$                   | $0.689^{+0.013}_{-0.013}$       | $100\theta_{\text{D}}$         | $0.16101^{+0.00050}_{-0.00049}$ | $\chi_{\text{CamSpec}}^2$   | $7063.0 (\nu: 13.4)$         |
| $\Omega_{\text{m}}$                  | $0.311^{+0.013}_{-0.013}$       | $z_{\text{eq}}$                | $3378^{+50}_{-49}$              | $\chi_{6\text{DF}}^2$       | $0.056 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^2$              | $0.1420^{+0.0021}_{-0.0021}$    | $k_{\text{eq}}$                | $0.01031^{+0.00015}_{-0.00015}$ | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^3$              | $0.09595^{+0.00085}_{-0.00082}$ | $100\theta_{\text{eq}}$        | $0.8174^{+0.0093}_{-0.0091}$    | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 1.1)$             |
| $\sigma_8$                           | $0.809^{+0.012}_{-0.011}$       | $100\theta_{\text{s,eq}}$      | $0.4516^{+0.0048}_{-0.0047}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.0)$             |
| $S_8$                                | $0.824^{+0.024}_{-0.023}$       | $H(0.15)$                      | $72.85^{+0.84}_{-0.83}$         | $\chi_{\text{CMB}}^2$       | $7492.6 (\nu: 14.1)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.451^{+0.013}_{-0.013}$       | $D_{\text{M}}(0.15)$           | $641.5^{+8.3}_{-8.2}$           | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.7)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                      | $82.95^{+0.64}_{-0.63}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7506.32; R - 1 = 0.00854$$



## 2.45 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00035}_{-0.00038}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.015}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $637^{+12}_{-11}$            |
| $\Omega_{\mathrm{c}} h^2$                | $0.1181^{+0.0031}_{-0.0029}$    | $\sigma_8/h^{0.5}$                    | $0.979^{+0.020}_{-0.023}$       | $H(0.38)$                   | $83.28^{+0.86}_{-0.90}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04121^{+0.00088}_{-0.00087}$ | $r_{\mathrm{drag}} h$                 | $100.5^{+2.3}_{-2.5}$           | $D_{\mathrm{M}}(0.38)$      | $1521^{+24}_{-23}$           |
| $\tau$                                   | $0.059^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$           | $2.422^{+0.048}_{-0.051}$       | $H(0.51)$                   | $89.92^{+0.71}_{-0.71}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.048^{+0.030}_{-0.027}$       | $z_{\mathrm{re}}$                     | $8.1^{+1.4}_{-1.5}$             | $D_{\mathrm{M}}(0.51)$      | $1972^{+28}_{-27}$           |
| $n_{\mathrm{s}}$                         | $0.9692^{+0.0099}_{-0.0093}$    | $10^9 A_{\mathrm{s}}$                 | $2.107^{+0.063}_{-0.058}$       | $H(0.61)$                   | $95.48^{+0.59}_{-0.57}$      |
| $y_{\mathrm{cal}}$                       | $1.0008^{+0.0048}_{-0.0046}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.873^{+0.023}_{-0.025}$       | $D_{\mathrm{M}}(0.61)$      | $2296^{+31}_{-29}$           |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{40}$                              | $1221^{+24}_{-25}$              | $H(2.33)$                   | $235.3^{+1.9}_{-1.8}$        |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5724^{+80}_{-78}$              | $D_{\mathrm{M}}(2.33)$      | $5757^{+26}_{-27}$           |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2535^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.451^{+0.015}_{-0.017}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $816.4^{+9.9}_{-9.8}$           | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $D_{2000}$                            | $230.5^{+3.4}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.471^{+0.012}_{-0.014}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.24}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9692^{+0.0099}_{-0.0093}$    | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0094}$   |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.51)$           | $0.470^{+0.010}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00014}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6210^{+0.0092}_{-0.0085}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.593^{+0.071}_{-0.067}$       | $f\sigma_8(0.61)$           | $0.4658^{+0.0097}_{-0.010}$  |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.39}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.784^{+0.060}_{-0.061}$      | $\sigma_8(0.61)$            | $0.5911^{+0.0092}_{-0.0082}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.33}$          | $z_*$                                 | $1089.80^{+0.63}_{-0.59}$       | $f\sigma_8(2.33)$           | $0.2983^{+0.0047}_{-0.0043}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                 | $144.95^{+0.71}_{-0.75}$        | $\sigma_8(2.33)$            | $0.3079^{+0.0051}_{-0.0048}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.30}$          | $100\theta_*$                         | $1.04140^{+0.00087}_{-0.00087}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                                | $0.9976^{+0.0020}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.918^{+0.073}_{-0.066}$      | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.72^{+0.75}_{-0.82}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                                    | $68.1^{+1.3}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.63^{+0.76}_{-0.76}$        | $\chi_{\mathrm{lensing}}^2$ | $9.8 (\nu: 1.0)$             |
| $\Omega_{\Lambda}$                       | $0.695^{+0.017}_{-0.019}$       | $k_{\mathrm{D}}$                      | $0.14027^{+0.00086}_{-0.00094}$ | $\chi_{\mathrm{simall}}^2$  | $397.9 (\nu: 3.4)$           |
| $\Omega_{\mathrm{m}}$                    | $0.305^{+0.019}_{-0.017}$       | $100\theta_{\mathrm{D}}$              | $0.16091^{+0.00050}_{-0.00047}$ | $\chi_{\mathrm{lowl}}^2$    | $22.67 (\nu: 0.4)$           |
| $\Omega_{\mathrm{m}} h^2$                | $0.1411^{+0.0030}_{-0.0027}$    | $z_{\mathrm{eq}}$                     | $3357^{+71}_{-65}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7064.4 (\nu: 15.2)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.09607^{+0.00082}_{-0.00083}$ | $k_{\mathrm{eq}}$                     | $0.01024^{+0.00022}_{-0.00020}$ | $\chi_{\mathrm{H073p45}}^2$ | $10.6 (\nu: 3.5)$            |
| $\sigma_8$                               | $0.808^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{eq}}$             | $0.822^{+0.012}_{-0.014}$       | $\chi_{\mathrm{prior}}^2$   | $7.4 (\nu: 5.9)$             |
| $S_8$                                    | $0.814^{+0.030}_{-0.035}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4538^{+0.0064}_{-0.0070}$    | $\chi_{\mathrm{CMB}}^2$     | $7494.7 (\nu: 19.8)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.446^{+0.017}_{-0.019}$       | $H(0.15)$                             | $73.3^{+1.1}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7512.76; R - 1 = 0.03489$$



## 2.46 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00034}_{-0.00036}$ | $\sigma_8/h^{0.5}$                 | $0.980^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1522^{+16}_{-16}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1182^{+0.0021}_{-0.0019}$    | $r_{\mathrm{drag}} h$              | $100.5^{+1.6}_{-1.6}$           | $H(0.51)$                   | $89.90^{+0.52}_{-0.51}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04119^{+0.00078}_{-0.00080}$ | $\langle d^2 \rangle^{1/2}$        | $2.423^{+0.042}_{-0.042}$       | $D_{\mathrm{M}}(0.51)$      | $1973^{+19}_{-18}$           |
| $\tau$                                   | $0.059^{+0.014}_{-0.013}$       | $z_{\mathrm{re}}$                  | $8.1^{+1.3}_{-1.4}$             | $H(0.61)$                   | $95.47^{+0.45}_{-0.44}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.048^{+0.028}_{-0.027}$       | $10^9 A_{\mathrm{s}}$              | $2.107^{+0.060}_{-0.057}$       | $D_{\mathrm{M}}(0.61)$      | $2296^{+21}_{-20}$           |
| $n_{\mathrm{s}}$                         | $0.9690^{+0.0078}_{-0.0081}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.874^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.2}$        |
| $y_{\mathrm{cal}}$                       | $1.0008^{+0.0048}_{-0.0047}$    | $D_{40}$                           | $1222^{+23}_{-23}$              | $D_{\mathrm{M}}(2.33)$      | $5757^{+22}_{-22}$           |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{220}$                          | $5725^{+78}_{-79}$              | $f\sigma_8(0.15)$           | $0.451^{+0.011}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{810}$                          | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{1420}$                         | $816.5^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.4711^{+0.0098}_{-0.0098}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                         | $230.5^{+3.4}_{-3.5}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0092}$   |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $n_{\mathrm{s},0.002}$             | $0.9690^{+0.0078}_{-0.0081}$    | $f\sigma_8(0.51)$           | $0.4705^{+0.0088}_{-0.0090}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.24}_{-0.25}$          | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00014}_{-0.00015}$ | $\sigma_8(0.51)$            | $0.6210^{+0.0094}_{-0.0085}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24670^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.61)$           | $0.4660^{+0.0082}_{-0.0083}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.593^{+0.068}_{-0.066}$       | $\sigma_8(0.61)$            | $0.5911^{+0.0090}_{-0.0082}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.785^{+0.051}_{-0.050}$      | $f\sigma_8(2.33)$           | $0.2983^{+0.0045}_{-0.0043}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.39}_{-0.39}$          | $z_*$                              | $1089.81^{+0.54}_{-0.50}$       | $\sigma_8(2.33)$            | $0.3078^{+0.0047}_{-0.0045}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.33}$          | $r_*$                              | $144.93^{+0.52}_{-0.54}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$                      | $1.04138^{+0.00076}_{-0.00081}$ | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.917^{+0.053}_{-0.054}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                | $1059.72^{+0.79}_{-0.82}$       | $\chi_{\mathrm{lensing}}^2$ | $9.6 (\nu: 0.6)$             |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                | $147.61^{+0.58}_{-0.61}$        | $\chi_{\mathrm{simall}}^2$  | $397.7 (\nu: 2.6)$           |
| $H_0$                                    | $68.05^{+0.90}_{-0.92}$         | $k_{\mathrm{D}}$                   | $0.14029^{+0.00079}_{-0.00080}$ | $\chi_{\mathrm{lowl}}^2$    | $22.69 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                       | $0.695^{+0.011}_{-0.012}$       | $100\theta_{\mathrm{D}}$           | $0.16091^{+0.00051}_{-0.00047}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.1 (\nu: 14.4)$         |
| $\Omega_{\mathrm{m}}$                    | $0.305^{+0.012}_{-0.011}$       | $z_{\mathrm{eq}}$                  | $3358^{+48}_{-44}$              | $\chi_{\mathrm{H073p45}}^2$ | $10.6 (\nu: 1.7)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1412^{+0.0020}_{-0.0018}$    | $k_{\mathrm{eq}}$                  | $0.01025^{+0.00015}_{-0.00013}$ | $\chi_{6\mathrm{DF}}^2$     | $0.027 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^3$                | $0.09607^{+0.00082}_{-0.00083}$ | $100\theta_{\mathrm{eq}}$          | $0.8214^{+0.0082}_{-0.0088}$    | $\chi_{\mathrm{MGS}}^2$     | $1.74 (\nu: 0.1)$            |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4536^{+0.0043}_{-0.0045}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $3.90 (\nu: 0.3)$            |
| $S_8$                                    | $0.815^{+0.022}_{-0.022}$       | $H(0.15)$                          | $73.26^{+0.79}_{-0.80}$         | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 6.0)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.446^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.15)$             | $637.5^{+7.9}_{-7.6}$           | $\chi_{\mathrm{CMB}}^2$     | $7494.1 (\nu: 15.7)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.600^{+0.012}_{-0.012}$       | $H(0.38)$                          | $83.25^{+0.61}_{-0.61}$         | $\chi_{\mathrm{BAO}}^2$     | $5.67 (\nu: 0.2)$            |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7517.92; R - 1 = 0.02825$$



## 2.47 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02219^{+0.00039}_{-0.00039}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.607^{+0.015}_{-0.014}$       | $D_{\text{M}}(0.15)$        | $644^{+11}_{-11}$            |
| $\Omega_{\text{c}}h^2$               | $0.1197^{+0.0027}_{-0.0028}$    | $\sigma_8/h^{0.5}$                 | $0.988^{+0.020}_{-0.020}$       | $H(0.38)$                   | $82.79^{+0.81}_{-0.78}$      |
| $100\theta_{\text{MC}}$              | $1.04093^{+0.00086}_{-0.00087}$ | $r_{\text{drag}}h$                 | $99.2^{+2.2}_{-2.1}$            | $D_{\text{M}}(0.38)$        | $1535^{+22}_{-22}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$        | $2.442^{+0.048}_{-0.047}$       | $H(0.51)$                   | $89.53^{+0.66}_{-0.64}$      |
| $\ln(10^{10}A_{\text{s}})$           | $3.043^{+0.027}_{-0.024}$       | $z_{\text{re}}$                    | $< 8.95$                        | $D_{\text{M}}(0.51)$        | $1988^{+25}_{-26}$           |
| $n_{\text{s}}$                       | $0.9653^{+0.0090}_{-0.0088}$    | $10^9 A_{\text{s}}$                | $2.097^{+0.056}_{-0.051}$       | $H(0.61)$                   | $95.17^{+0.55}_{-0.53}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.878^{+0.022}_{-0.021}$       | $D_{\text{M}}(0.61)$        | $2312^{+27}_{-28}$           |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{40}$                           | $1227^{+24}_{-24}$              | $H(2.33)$                   | $236.2^{+1.7}_{-1.7}$        |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{220}$                          | $5710^{+82}_{-78}$              | $D_{\text{M}}(2.33)$        | $5771^{+26}_{-26}$           |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                          | $2534^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.459^{+0.015}_{-0.015}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{1420}$                         | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.749^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.43$                        | $D_{2000}$                         | $229.7^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.477^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $n_{\text{s},0.002}$               | $0.9653^{+0.0090}_{-0.0088}$    | $\sigma_8(0.38)$            | $0.6632^{+0.0096}_{-0.0084}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24532^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.51)$           | $0.475^{+0.010}_{-0.010}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24664^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.6205^{+0.0086}_{-0.0080}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 D/H$                         | $2.620^{+0.075}_{-0.072}$       | $f\sigma_8(0.61)$           | $0.4695^{+0.0091}_{-0.0092}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.40}$          | $\text{Age/Gyr}$                   | $13.814^{+0.059}_{-0.060}$      | $\sigma_8(0.61)$            | $0.5904^{+0.0082}_{-0.0076}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $z_*$                              | $1090.12^{+0.63}_{-0.64}$       | $f\sigma_8(2.33)$           | $0.2975^{+0.0042}_{-0.0039}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                              | $144.65^{+0.66}_{-0.66}$        | $\sigma_8(2.33)$            | $0.3066^{+0.0046}_{-0.0042}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$                      | $1.04113^{+0.00084}_{-0.00086}$ | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.893^{+0.063}_{-0.063}$      | $f_{2000}^{217}$            | $107.5^{+4.0}_{-4.0}$        |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                  | $1059.49^{+0.82}_{-0.86}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $H_0$                                | $67.3^{+1.3}_{-1.2}$            | $r_{\text{drag}}$                  | $147.37^{+0.70}_{-0.69}$        | $\chi_{\text{lensing}}^2$   | $9.41 (\nu: 0.3)$            |
| $\Omega_{\Lambda}$                   | $0.685^{+0.017}_{-0.017}$       | $k_{\text{D}}$                     | $0.14043^{+0.00085}_{-0.00084}$ | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.6)$           |
| $\Omega_{\text{m}}$                  | $0.315^{+0.017}_{-0.017}$       | $100\theta_{\text{D}}$             | $0.16102^{+0.00050}_{-0.00049}$ | $\chi_{\text{lowl}}^2$      | $23.29 (\nu: 0.5)$           |
| $\Omega_{\text{m}}h^2$               | $0.1425^{+0.0026}_{-0.0026}$    | $z_{\text{eq}}$                    | $3391^{+63}_{-63}$              | $\chi_{\text{CamSpec}}^2$   | $7062.8 (\nu: 13.3)$         |
| $\Omega_{\text{m}}h^3$               | $0.09594^{+0.00086}_{-0.00083}$ | $k_{\text{eq}}$                    | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{\text{JLA}}^2$       | $1035.39 (\nu: 0.2)$         |
| $\sigma_8$                           | $0.810^{+0.012}_{-0.012}$       | $100\theta_{\text{eq}}$            | $0.815^{+0.012}_{-0.012}$       | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.1)$             |
| $S_8$                                | $0.830^{+0.030}_{-0.029}$       | $100\theta_{\text{s,eq}}$          | $0.4504^{+0.0062}_{-0.0060}$    | $\chi_{\text{CMB}}^2$       | $7492.5 (\nu: 14.2)$         |
| $\sigma_8\Omega_{\text{m}}^{0.5}$    | $0.455^{+0.016}_{-0.016}$       | $H(0.15)$                          | $72.6^{+1.1}_{-1.1}$            |                             |                              |

$\bar{\chi}_{\text{eff}}^2 = 8535.44$ ;  $R - 1 = 0.00636$



## 2.48 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_JLA\_Riess18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|--------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00037}_{-0.00036}$ | $r_{\text{drag}} h$            | $100.5^{+1.5}_{-1.6}$           | $D_{\text{M}}(0.51)$        | $1972^{+19}_{-19}$           |
| $\Omega_c h^2$                       | $0.1181^{+0.0020}_{-0.0020}$    | $\langle d^2 \rangle^{1/2}$    | $2.422^{+0.041}_{-0.043}$       | $H(0.61)$                   | $95.48^{+0.45}_{-0.45}$      |
| $100\theta_{\text{MC}}$              | $1.04120^{+0.00079}_{-0.00081}$ | $z_{\text{re}}$                | $8.1^{+1.3}_{-1.4}$             | $D_{\text{M}}(0.61)$        | $2295^{+21}_{-21}$           |
| $\tau$                               | $0.059^{+0.015}_{-0.013}$       | $10^9 A_{\text{s}}$            | $2.107^{+0.060}_{-0.057}$       | $H(2.33)$                   | $235.3^{+1.3}_{-1.3}$        |
| $\ln(10^{10} A_{\text{s}})$          | $3.048^{+0.029}_{-0.026}$       | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.874^{+0.022}_{-0.021}$       | $D_{\text{M}}(2.33)$        | $5757^{+22}_{-23}$           |
| $n_{\text{s}}$                       | $0.9692^{+0.0079}_{-0.0077}$    | $D_{40}$                       | $1221^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.451^{+0.011}_{-0.012}$    |
| $y_{\text{cal}}$                     | $1.0008^{+0.0051}_{-0.0051}$    | $D_{220}$                      | $5726^{+80}_{-77}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                      | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.4706^{+0.0095}_{-0.0099}$ |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{1420}$                     | $817^{+10}_{-9.9}$              | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0090}$   |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{2000}$                     | $230.6^{+3.5}_{-3.6}$           | $f\sigma_8(0.51)$           | $0.4700^{+0.0086}_{-0.0088}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-20}$                | $n_{\text{s},0.002}$           | $0.9692^{+0.0079}_{-0.0077}$    | $\sigma_8(0.51)$            | $0.6209^{+0.0091}_{-0.0088}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.47$                        | $Y_{\text{P}}$                 | $0.24538^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.61)$           | $0.4657^{+0.0080}_{-0.0080}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$    | $0.24671^{+0.00014}_{-0.00015}$ | $\sigma_8(0.61)$            | $0.5910^{+0.0089}_{-0.0082}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$       | $2.592^{+0.069}_{-0.067}$       | $f\sigma_8(2.33)$           | $0.2983^{+0.0045}_{-0.0041}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$        | $13.784^{+0.051}_{-0.052}$      | $\sigma_8(2.33)$            | $0.3078^{+0.0047}_{-0.0044}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                          | $1089.79^{+0.52}_{-0.54}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.36}_{-0.38}$          | $r_*$                          | $144.95^{+0.52}_{-0.54}$        | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $100\theta_*$                  | $1.04139^{+0.00077}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.919^{+0.053}_{-0.055}$      | $\chi_{\text{lensing}}^2$   | $9.6 (\nu: 0.6)$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.30}$          | $z_{\text{drag}}$              | $1059.73^{+0.78}_{-0.83}$       | $\chi_{\text{simall}}^2$    | $397.7 (\nu: 2.6)$           |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0019}$    | $r_{\text{drag}}$              | $147.64^{+0.61}_{-0.58}$        | $\chi_{\text{lowl}}^2$      | $22.66 (\nu: 0.3)$           |
| $c_{217}$                            | $1.0012^{+0.0033}_{-0.0030}$    | $k_{\text{D}}$                 | $0.14027^{+0.00075}_{-0.00082}$ | $\chi_{\text{CamSpec}}^2$   | $7064.4 (\nu: 14.7)$         |
| $H_0$                                | $68.10^{+0.95}_{-0.92}$         | $100\theta_{\text{D}}$         | $0.16091^{+0.00051}_{-0.00048}$ | $\chi_{\text{H073p45}}^2$   | $10.4 (\nu: 1.6)$            |
| $\Omega_{\Lambda}$                   | $0.696^{+0.011}_{-0.012}$       | $z_{\text{eq}}$                | $3356^{+47}_{-45}$              | $\chi_{\text{JLA}}^2$       | $706.61 (\nu: 0.0)$          |
| $\Omega_{\text{m}}$                  | $0.304^{+0.012}_{-0.011}$       | $k_{\text{eq}}$                | $0.01024^{+0.00014}_{-0.00014}$ | $\chi_{6\text{DF}}^2$       | $0.026 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^2$              | $0.1411^{+0.0020}_{-0.0019}$    | $100\theta_{\text{eq}}$        | $0.8219^{+0.0090}_{-0.0086}$    | $\chi_{\text{MGS}}^2$       | $1.80 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^3$              | $0.09607^{+0.00084}_{-0.00084}$ | $100\theta_{\text{s,eq}}$      | $0.4539^{+0.0045}_{-0.0044}$    | $\chi_{\text{DR12BAO}}^2$   | $3.84 (\nu: 0.2)$            |
| $\sigma_8$                           | $0.808^{+0.013}_{-0.011}$       | $H(0.15)$                      | $73.31^{+0.83}_{-0.80}$         | $\chi_{\text{prior}}^2$     | $7.5 (\nu: 6.4)$             |
| $S_8$                                | $0.813^{+0.022}_{-0.022}$       | $D_{\text{M}}(0.15)$           | $637.1^{+7.9}_{-7.9}$           | $\chi_{\text{CMB}}^2$       | $7494.4 (\nu: 16.3)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.446^{+0.012}_{-0.012}$       | $H(0.38)$                      | $83.28^{+0.63}_{-0.62}$         | $\chi_{\text{BAO}}^2$       | $5.67 (\nu: 0.2)$            |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.600^{+0.012}_{-0.012}$       | $D_{\text{M}}(0.38)$           | $1521^{+16}_{-16}$              |                             |                              |
| $\sigma_8/h^{0.5}$                   | $0.979^{+0.017}_{-0.018}$       | $H(0.51)$                      | $89.92^{+0.51}_{-0.52}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8224.63; R - 1 = 0.08788$$



## 2.49 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02224^{+0.00037}_{-0.00036}$ | $\sigma_8/h^{0.5}$                 | $0.984^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1529^{+16}_{-16}$           |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1190^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}h$               | $99.8^{+1.6}_{-1.6}$            | $H(0.51)$                   | $89.69^{+0.52}_{-0.51}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04104^{+0.00080}_{-0.00082}$ | $\langle d^2 \rangle^{1/2}$        | $2.432^{+0.041}_{-0.040}$       | $D_{\mathrm{M}}(0.51)$      | $1981^{+19}_{-19}$           |
| $\tau$                                   | $0.057^{+0.014}_{-0.013}$       | $z_{\mathrm{re}}$                  | $7.9^{+1.2}_{-1.3}$             | $H(0.61)$                   | $95.29^{+0.45}_{-0.44}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.045^{+0.028}_{-0.026}$       | $10^9 A_{\mathrm{s}}$              | $2.101^{+0.058}_{-0.054}$       | $D_{\mathrm{M}}(0.61)$      | $2305^{+21}_{-21}$           |
| $n_{\mathrm{s}}$                         | $0.9670^{+0.0079}_{-0.0080}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$    | $1.876^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.8^{+1.4}_{-1.3}$        |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0050}_{-0.0048}$    | $D_{40}$                           | $1224^{+23}_{-23}$              | $D_{\mathrm{M}}(2.33)$      | $5765^{+22}_{-22}$           |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{220}$                          | $5715^{+80}_{-78}$              | $f\sigma_8(0.15)$           | $0.455^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                          | $2534^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.010}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                         | $815^{+10}_{-9.8}$              | $f\sigma_8(0.38)$           | $0.4738^{+0.0097}_{-0.0097}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{2000}$                         | $230.0^{+3.4}_{-3.4}$           | $\sigma_8(0.38)$            | $0.6631^{+0.0095}_{-0.0091}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.43$                        | $n_{\mathrm{s},0.002}$             | $0.9670^{+0.0079}_{-0.0080}$    | $f\sigma_8(0.51)$           | $0.4726^{+0.0087}_{-0.0088}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.24}_{-0.24}$          | $Y_{\mathrm{P}}$                   | $0.24534^{+0.00015}_{-0.00016}$ | $\sigma_8(0.51)$            | $0.6206^{+0.0089}_{-0.0084}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24667^{+0.00015}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.4678^{+0.0081}_{-0.0080}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.611^{+0.070}_{-0.067}$       | $\sigma_8(0.61)$            | $0.5906^{+0.0085}_{-0.0080}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.803^{+0.052}_{-0.052}$      | $f\sigma_8(2.33)$           | $0.2978^{+0.0043}_{-0.0041}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $z_*$                              | $1090.00^{+0.54}_{-0.54}$       | $\sigma_8(2.33)$            | $0.3071^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.34}$          | $r_*$                              | $144.80^{+0.55}_{-0.54}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                      | $1.04124^{+0.00079}_{-0.00081}$ | $f_{2000}^{217}$            | $107.3^{+4.1}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.907^{+0.053}_{-0.054}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                | $1059.55^{+0.84}_{-0.84}$       | $\chi_{\mathrm{lensing}}^2$ | $9.36 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                | $147.52^{+0.61}_{-0.60}$        | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 1.9)$           |
| $H_0$                                    | $67.65^{+0.93}_{-0.92}$         | $k_{\mathrm{D}}$                   | $0.14032^{+0.00080}_{-0.00080}$ | $\chi_{\mathrm{lowl}}^2$    | $22.98 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{D}}$           | $0.16100^{+0.00050}_{-0.00048}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.2 (\nu: 13.5)$         |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                  | $3374^{+49}_{-47}$              | $\chi_{\mathrm{JLA}}^2$     | $1035.06 (\nu: 0.0)$         |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1418^{+0.0020}_{-0.0020}$    | $k_{\mathrm{eq}}$                  | $0.01030^{+0.00015}_{-0.00014}$ | $\chi_{6\mathrm{DF}}^2$     | $0.046 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}h^3$                 | $0.09596^{+0.00085}_{-0.00082}$ | $100\theta_{\mathrm{eq}}$          | $0.8181^{+0.0089}_{-0.0088}$    | $\chi_{\mathrm{MGS}}^2$     | $1.36 (\nu: 0.1)$            |
| $\sigma_8$                               | $0.809^{+0.012}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4520^{+0.0047}_{-0.0046}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.9)$             |
| $S_8$                                    | $0.822^{+0.023}_{-0.023}$       | $H(0.15)$                          | $72.91^{+0.81}_{-0.80}$         | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.0)$             |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.450^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$             | $640.9^{+8.0}_{-7.9}$           | $\chi_{\mathrm{CMB}}^2$     | $7492.8 (\nu: 14.3)$         |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$     | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                          | $82.99^{+0.62}_{-0.61}$         | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.5)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8541.35; R - 1 = 0.00983$$



## 2.50 base\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00034}_{-0.00036}$ | $r_{\mathrm{drag}} h$              | $100.5^{+1.5}_{-1.5}$           | $D_{\mathrm{M}}(0.51)$      | $1972^{+18}_{-18}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1181^{+0.0020}_{-0.0019}$    | $\langle d^2 \rangle^{1/2}$        | $2.423^{+0.042}_{-0.042}$       | $H(0.61)$                   | $95.48^{+0.44}_{-0.43}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04120^{+0.00077}_{-0.00081}$ | $z_{\mathrm{re}}$                  | $8.1^{+1.3}_{-1.4}$             | $D_{\mathrm{M}}(0.61)$      | $2296^{+20}_{-19}$           |
| $\tau$                                   | $0.059^{+0.014}_{-0.013}$       | $10^9 A_{\mathrm{s}}$              | $2.107^{+0.060}_{-0.057}$       | $H(2.33)$                   | $235.3^{+1.3}_{-1.2}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.048^{+0.028}_{-0.027}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.874^{+0.021}_{-0.020}$       | $D_{\mathrm{M}}(2.33)$      | $5757^{+22}_{-22}$           |
| $n_{\mathrm{s}}$                         | $0.9692^{+0.0078}_{-0.0080}$    | $D_{40}$                           | $1221^{+23}_{-23}$              | $f\sigma_8(0.15)$           | $0.451^{+0.011}_{-0.011}$    |
| $y_{\mathrm{cal}}$                       | $1.0009^{+0.0048}_{-0.0047}$    | $D_{220}$                          | $5726^{+78}_{-79}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{810}$                          | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4708^{+0.0096}_{-0.0096}$ |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                         | $816.6^{+9.8}_{-9.8}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0092}$   |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{2000}$                         | $230.6^{+3.4}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.4703^{+0.0086}_{-0.0089}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9692^{+0.0078}_{-0.0080}$    | $\sigma_8(0.51)$            | $0.6210^{+0.0094}_{-0.0086}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00014}_{-0.00015}$ | $f\sigma_8(0.61)$           | $0.4659^{+0.0081}_{-0.0082}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.24}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24671^{+0.00014}_{-0.00015}$ | $\sigma_8(0.61)$            | $0.5911^{+0.0090}_{-0.0082}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.592^{+0.067}_{-0.065}$       | $f\sigma_8(2.33)$           | $0.2983^{+0.0045}_{-0.0043}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.784^{+0.050}_{-0.049}$      | $\sigma_8(2.33)$            | $0.3079^{+0.0050}_{-0.0044}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1089.80^{+0.51}_{-0.51}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.39}_{-0.39}$          | $r_*$                              | $144.94^{+0.52}_{-0.54}$        | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.0}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.33}$          | $100\theta_*$                      | $1.04139^{+0.00076}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.918^{+0.052}_{-0.054}$      | $\chi_{\mathrm{lensing}}^2$ | $9.6 (\nu: 0.6)$             |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                | $1059.73^{+0.78}_{-0.82}$       | $\chi_{\mathrm{simall}}^2$  | $397.7 (\nu: 2.7)$           |
| $c_{100}$                                | $0.9976^{+0.0020}_{-0.0020}$    | $r_{\mathrm{drag}}$                | $147.63^{+0.57}_{-0.59}$        | $\chi_{\mathrm{lowl}}^2$    | $22.66 (\nu: 0.3)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $k_{\mathrm{D}}$                   | $0.14028^{+0.00078}_{-0.00081}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.2 (\nu: 14.4)$         |
| $H_0$                                    | $68.09^{+0.89}_{-0.89}$         | $100\theta_{\mathrm{D}}$           | $0.16091^{+0.00050}_{-0.00047}$ | $\chi_{\mathrm{H073p45}}^2$ | $10.5 (\nu: 1.5)$            |
| $\Omega_{\Lambda}$                       | $0.696^{+0.011}_{-0.012}$       | $z_{\mathrm{eq}}$                  | $3357^{+46}_{-43}$              | $\chi_{\mathrm{JLA}}^2$     | $1034.87 (\nu: 0.0)$         |
| $\Omega_{\mathrm{m}}$                    | $0.304^{+0.012}_{-0.011}$       | $k_{\mathrm{eq}}$                  | $0.01024^{+0.00014}_{-0.00013}$ | $\chi_{6\mathrm{DF}}^2$     | $0.025 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                | $0.1411^{+0.0019}_{-0.0018}$    | $100\theta_{\mathrm{eq}}$          | $0.8217^{+0.0079}_{-0.0084}$    | $\chi_{\mathrm{MGS}}^2$     | $1.77 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.09607^{+0.00082}_{-0.00083}$ | $100\theta_{\mathrm{s,eq}}$        | $0.4538^{+0.0042}_{-0.0044}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $3.84 (\nu: 0.2)$            |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.012}$       | $H(0.15)$                          | $73.29^{+0.76}_{-0.77}$         | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 6.1)$             |
| $S_8$                                    | $0.814^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(0.15)$             | $637.3^{+7.6}_{-7.3}$           | $\chi_{\mathrm{CMB}}^2$     | $7494.2 (\nu: 15.7)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.446^{+0.012}_{-0.012}$       | $H(0.38)$                          | $83.27^{+0.60}_{-0.59}$         | $\chi_{\mathrm{BAO}}^2$     | $5.64 (\nu: 0.2)$            |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.600^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$             | $1522^{+15}_{-15}$              |                             |                              |
| $\sigma_8/h^{0.5}$                       | $0.979^{+0.017}_{-0.017}$       | $H(0.51)$                          | $89.92^{+0.51}_{-0.49}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8552.73; R - 1 = 0.03088$$



## 2.51 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022277 | $0.02229^{+0.00030}_{-0.00030}$ | $S_8$                       | 0.8292   | $0.828^{+0.026}_{-0.025}$       | $100\theta_{s,eq}$          | 0.4499   | $0.4502^{+0.0051}_{-0.0051}$ |
| $\Omega_c h^2$              | 0.11981  | $0.1197^{+0.0024}_{-0.0023}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4542   | $0.454^{+0.014}_{-0.013}$       | $H(0.15)$                   | 72.64    | $72.70^{+0.89}_{-0.91}$      |
| $100\theta_{MC}$            | 1.04085  | $1.04087^{+0.00061}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6063   | $0.606^{+0.013}_{-0.012}$       | $D_M(0.15)$                 | 643.7    | $643.2^{+9.2}_{-8.8}$        |
| $\tau$                      | 0.0529   | $0.054^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9864   | $0.986^{+0.018}_{-0.018}$       | $H(0.38)$                   | 82.81    | $82.85^{+0.65}_{-0.66}$      |
| $\ln(10^{10} A_s)$          | 3.0402   | $3.041^{+0.029}_{-0.028}$       | $r_{drag} h$                | 99.13    | $99.2^{+1.8}_{-1.8}$            | $D_M(0.38)$                 | 1534.4   | $1533^{+18}_{-18}$           |
| $n_s$                       | 0.9653   | $0.9656^{+0.0082}_{-0.0082}$    | $\langle d^2 \rangle^{1/2}$ | 2.4388   | $2.438^{+0.043}_{-0.042}$       | $H(0.51)$                   | 89.56    | $89.60^{+0.52}_{-0.53}$      |
| $y_{cal}$                   | 1.00062  | $1.0005^{+0.0049}_{-0.0049}$    | $z_{re}$                    | 7.56     | $7.6^{+1.5}_{-1.5}$             | $D_M(0.51)$                 | 1987.1   | $1986^{+21}_{-21}$           |
| $A_{100}^{PS}$              | 234.9    | $239^{+50}_{-50}$               | $10^9 A_s$                  | 2.091    | $2.092^{+0.062}_{-0.057}$       | $H(0.61)$                   | 95.204   | $95.23^{+0.43}_{-0.43}$      |
| $A_{143}^{PS}$              | 46.5     | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8810   | $1.879^{+0.021}_{-0.021}$       | $D_M(0.61)$                 | 2311.9   | $2310^{+23}_{-22}$           |
| $A_{217}^{PS}$              | 103.1    | $102^{+30}_{-30}$               | $D_{40}$                    | 1228.3   | $1227^{+24}_{-23}$              | $H(2.33)$                   | 236.34   | $236.3^{+1.4}_{-1.4}$        |
| $A_{217}^{CIB}$             | 43.3     | $40^{+10}_{-10}$                | $D_{220}$                   | 5722     | $5720^{+77}_{-77}$              | $D_M(2.33)$                 | 5768.1   | $5767^{+20}_{-20}$           |
| $A_{143}^{tSZ}$             | 6.16     | $< 7.49$                        | $D_{810}$                   | 2537.0   | $2535^{+26}_{-26}$              | $f\sigma_8(0.15)$           | 0.4585   | $0.458^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | 0.667    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | 816.1    | $815.7^{+9.5}_{-9.4}$           | $\sigma_8(0.15)$            | 0.7475   | $0.747^{+0.011}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | 0.85     | —                               | $D_{2000}$                  | 230.34   | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | 0.4760   | $0.476^{+0.010}_{-0.010}$    |
| $\xi^{tSZ \times CIB}$      | 0.52     | —                               | $n_{s,0.002}$               | 0.9653   | $0.9656^{+0.0082}_{-0.0082}$    | $\sigma_8(0.38)$            | 0.6623   | $0.6622^{+0.0095}_{-0.0091}$ |
| $A^{kSZ}$                   | 0.8      | —                               | $Y_P$                       | 0.245358 | $0.24536^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.51)$           | 0.4742   | $0.4738^{+0.0092}_{-0.0090}$ |
| $A_{100}^{dust}$            | 1.003    | $1.01^{+0.38}_{-0.39}$          | $Y_P^{BBN}$                 | 0.246684 | $0.24669^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | 0.6196   | $0.6196^{+0.0090}_{-0.0085}$ |
| $A_{143}^{dust}$            | 0.978    | $0.96^{+0.34}_{-0.35}$          | $10^5 D/H$                  | 2.603    | $2.600^{+0.058}_{-0.055}$       | $f\sigma_8(0.61)$           | 0.4690   | $0.4687^{+0.0083}_{-0.0082}$ |
| $A_{217}^{dust}$            | 0.975    | $0.97^{+0.21}_{-0.21}$          | $Age/Gyr$                   | 13.8081  | $13.805^{+0.045}_{-0.045}$      | $\sigma_8(0.61)$            | 0.5895   | $0.5895^{+0.0086}_{-0.0081}$ |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | 1090.02  | $1089.99^{+0.51}_{-0.50}$       | $f\sigma_8(2.33)$           | 0.29708  | $0.2971^{+0.0045}_{-0.0042}$ |
| $c_{100}$                   | 0.99777  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                       | 144.55   | $144.57^{+0.54}_{-0.53}$        | $\sigma_8(2.33)$            | 0.30613  | $0.3062^{+0.0049}_{-0.0046}$ |
| $c_{217}$                   | 1.00133  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | 1.04104  | $1.04106^{+0.00060}_{-0.00061}$ | $f_{2000}^{143}$            | 30.4     | $30^{+6}_{-6}$               |
| $c_{TE}$                    | 0.9967   | $0.9966^{+0.0096}_{-0.0095}$    | $D_M(z_*)/Gpc$              | 13.885   | $13.887^{+0.051}_{-0.050}$      | $f_{2000}^{217}$            | 106.92   | $106.9^{+3.7}_{-3.8}$        |
| $c_{EE}$                    | 0.9925   | $0.9921^{+0.0097}_{-0.0095}$    | $z_{drag}$                  | 1059.70  | $1059.74^{+0.61}_{-0.64}$       | $f_{2000}^{143 \times 217}$ | 32.31    | $32^{+4}_{-4}$               |
| $H_0$                       | 67.32    | $67.4^{+1.0}_{-1.1}$            | $r_{drag}$                  | 147.25   | $147.26^{+0.56}_{-0.54}$        | $\chi_{lensing}^2$          | 8.83     | $9.30 (\nu: 0.2)$            |
| $\Omega_\Lambda$            | 0.6851   | $0.686^{+0.014}_{-0.015}$       | $k_D$                       | 0.14063  | $0.14063^{+0.00064}_{-0.00064}$ | $\chi_{small}^2$            | 395.87   | $396.9 (\nu: 1.3)$           |
| $\Omega_m$                  | 0.3149   | $0.314^{+0.015}_{-0.014}$       | $100\theta_D$               | 0.160882 | $0.16087^{+0.00038}_{-0.00037}$ | $\chi_{lowl}^2$             | 23.22    | $23.22 (\nu: 0.4)$           |
| $\Omega_m h^2$              | 0.14273  | $0.1426^{+0.0022}_{-0.0022}$    | $z_{eq}$                    | 3395     | $3393^{+53}_{-53}$              | $\chi_{CamSpec}^2$          | 11499.6  | $11514.1 (\nu: 15.3)$        |
| $\Omega_m h^3$              | 0.09609  | $0.09610^{+0.00061}_{-0.00062}$ | $k_{eq}$                    | 0.010363 | $0.01036^{+0.00016}_{-0.00016}$ | $\chi_{prior}^2$            | 2.1      | $7.9 (\nu: 6.0)$             |
| $\sigma_8$                  | 0.8093   | $0.809^{+0.012}_{-0.012}$       | $100\theta_{eq}$            | 0.8142   | $0.815^{+0.010}_{-0.010}$       | $\chi_{CMB}^2$              | 11927.6  | $11943.6 (\nu: 16.5)$        |

Best-fit  $\chi_{eff}^2 = 11929.66$ ;  $\bar{\chi}_{eff}^2 = 11951.44$ ;  $R - 1 = 0.00801$   
 $\chi_{eff}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.83 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 commander\_dx12\_v3.2\_29: 23.22 CamSpec like\_10.7HM\_1400\_unified: 11499.65



## 2.52 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02234^{+0.00028}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.011}_{-0.011}$       | $D_M(0.38)$                 | $1529^{+15}_{-14}$           |
| $\Omega_c h^2$              | $0.1191^{+0.0019}_{-0.0018}$    | $\sigma_8/h^{0.5}$          | $0.983^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.73^{+0.43}_{-0.44}$      |
| $100\theta_{MC}$            | $1.04095^{+0.00057}_{-0.00060}$ | $r_{drag}h$                 | $99.7^{+1.4}_{-1.4}$            | $D_M(0.51)$                 | $1980^{+17}_{-16}$           |
| $\tau$                      | $0.055^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | $2.431^{+0.039}_{-0.039}$       | $H(0.61)$                   | $95.33^{+0.35}_{-0.37}$      |
| $\ln(10^{10} A_s)$          | $3.043^{+0.029}_{-0.027}$       | $z_{re}$                    | $7.8^{+1.5}_{-1.4}$             | $D_M(0.61)$                 | $2305^{+19}_{-18}$           |
| $n_s$                       | $0.9671^{+0.0075}_{-0.0075}$    | $10^9 A_s$                  | $2.097^{+0.062}_{-0.057}$       | $H(2.33)$                   | $235.9^{+1.2}_{-1.1}$        |
| $y_{cal}$                   | $1.0007^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | $5763^{+18}_{-17}$           |
| $A_{100}^{PS}$              | $239^{+50}_{-50}$               | $D_{40}$                    | $1225^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5725^{+75}_{-78}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.010}$    |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{810}$                   | $2536^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4735^{+0.0091}_{-0.0090}$ |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{1420}$                  | $816.3^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6623^{+0.0098}_{-0.0089}$ |
| $A_{143}^{tSZ}$             | $< 7.56$                        | $D_{2000}$                  | $230.5^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4722^{+0.0082}_{-0.0082}$ |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9671^{+0.0075}_{-0.0075}$    | $\sigma_8(0.51)$            | $0.6199^{+0.0091}_{-0.0084}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24538^{+0.00010}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4674^{+0.0077}_{-0.0077}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5899^{+0.0087}_{-0.0081}$ |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.592^{+0.055}_{-0.050}$       | $f\sigma_8(2.33)$           | $0.2975^{+0.0045}_{-0.0041}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | $13.796^{+0.041}_{-0.038}$      | $\sigma_8(2.33)$            | $0.3067^{+0.0048}_{-0.0044}$ |
| $A_{143}^{dust}$            | $0.96^{+0.33}_{-0.33}$          | $z_*$                       | $1089.88^{+0.45}_{-0.43}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | $0.97^{+0.22}_{-0.21}$          | $r_*$                       | $144.70^{+0.46}_{-0.45}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04114^{+0.00056}_{-0.00058}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.898^{+0.044}_{-0.043}$      | $\chi^2_{lensing}$          | $9.31 (\nu: 0.3)$            |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | $1059.79^{+0.60}_{-0.62}$       | $\chi^2_{simall}$           | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                    | $0.9966^{+0.0096}_{-0.0098}$    | $r_{drag}$                  | $147.38^{+0.49}_{-0.48}$        | $\chi^2_{lowl}$             | $22.98 (\nu: 0.3)$           |
| $c_{EE}$                    | $0.9923^{+0.0097}_{-0.0095}$    | $k_D$                       | $0.14054^{+0.00061}_{-0.00061}$ | $\chi^2_{CamSpec}$          | $11514.2 (\nu: 15.4)$        |
| $H_0$                       | $67.66^{+0.81}_{-0.84}$         | $100\theta_D$               | $0.16084^{+0.00038}_{-0.00036}$ | $\chi^2_{6DF}$              | $0.047 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | $0.690^{+0.011}_{-0.011}$       | $z_{eq}$                    | $3379^{+43}_{-42}$              | $\chi^2_{MGS}$              | $1.31 (\nu: 0.1)$            |
| $\Omega_m$                  | $0.310^{+0.011}_{-0.011}$       | $k_{eq}$                    | $0.01031^{+0.00013}_{-0.00013}$ | $\chi^2_{DR12BAO}$          | $4.6 (\nu: 0.8)$             |
| $\Omega_m h^2$              | $0.1421^{+0.0018}_{-0.0017}$    | $100\theta_{eq}$            | $0.8174^{+0.0079}_{-0.0080}$    | $\chi^2_{prior}$            | $7.8 (\nu: 6.0)$             |
| $\Omega_m h^3$              | $0.09611^{+0.00061}_{-0.00063}$ | $100\theta_{s,eq}$          | $0.4515^{+0.0041}_{-0.0041}$    | $\chi^2_{CMB}$              | $11943.6 (\nu: 16.6)$        |
| $\sigma_8$                  | $0.808^{+0.012}_{-0.011}$       | $H(0.15)$                   | $72.93^{+0.70}_{-0.72}$         | $\chi^2_{BAO}$              | $6.00 (\nu: 0.5)$            |
| $S_8$                       | $0.822^{+0.021}_{-0.021}$       | $D_M(0.15)$                 | $640.8^{+7.2}_{-6.9}$           |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.02^{+0.52}_{-0.54}$         |                             |                              |

$$\bar{\chi}^2_{\text{eff}} = 11957.40; R - 1 = 0.01372$$



### 2.53 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_Riess18

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02240^{+0.00028}_{-0.00029}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.447^{+0.013}_{-0.013}$       | $D_{\text{M}}(0.15)$        | $638.3^{+8.6}_{-8.1}$        |
| $\Omega_{\text{c}}h^2$               | $0.1185^{+0.0022}_{-0.0022}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.601^{+0.012}_{-0.012}$       | $H(0.38)$                   | $83.21^{+0.61}_{-0.64}$      |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00062}_{-0.00066}$ | $\sigma_8/h^{0.5}$                 | $0.980^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1523^{+17}_{-16}$           |
| $\tau$                               | $0.057^{+0.016}_{-0.014}$       | $r_{\text{drag}}h$                 | $100.2^{+1.8}_{-1.8}$           | $H(0.51)$                   | $89.88^{+0.50}_{-0.51}$      |
| $\ln(10^{10}A_{\text{s}})$           | $3.046^{+0.030}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$        | $2.425^{+0.042}_{-0.039}$       | $D_{\text{M}}(0.51)$        | $1974^{+20}_{-19}$           |
| $n_{\text{s}}$                       | $0.9685^{+0.0078}_{-0.0080}$    | $z_{\text{re}}$                    | $7.9^{+1.5}_{-1.5}$             | $H(0.61)$                   | $95.46^{+0.43}_{-0.42}$      |
| $y_{\text{cal}}$                     | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_{\text{s}}$                | $2.103^{+0.065}_{-0.060}$       | $D_{\text{M}}(0.61)$        | $2298^{+22}_{-21}$           |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.876^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.6^{+1.4}_{-1.3}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                           | $1223^{+23}_{-23}$              | $D_{\text{M}}(2.33)$        | $5757^{+19}_{-21}$           |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                          | $5732^{+74}_{-75}$              | $f\sigma_8(0.15)$           | $0.452^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                          | $2537^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.61$                        | $D_{1420}$                         | $817.2^{+9.0}_{-9.4}$           | $f\sigma_8(0.38)$           | $0.4715^{+0.0099}_{-0.0095}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.25}_{-0.25}$          | $D_{2000}$                         | $230.9^{+3.0}_{-3.2}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0093}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$               | $0.9685^{+0.0078}_{-0.0080}$    | $f\sigma_8(0.51)$           | $0.4707^{+0.0088}_{-0.0085}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                     | $0.24540^{+0.00011}_{-0.00011}$ | $\sigma_8(0.51)$            | $0.6203^{+0.0095}_{-0.0088}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24673^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4661^{+0.0081}_{-0.0078}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.36}_{-0.39}$          | $10^5 \text{D}/\text{H}$           | $2.581^{+0.055}_{-0.049}$       | $\sigma_8(0.61)$            | $0.5904^{+0.0091}_{-0.0085}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.33}$          | $\text{Age}/\text{Gyr}$            | $13.784^{+0.044}_{-0.047}$      | $f\sigma_8(2.33)$           | $0.2979^{+0.0046}_{-0.0043}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.22}_{-0.20}$          | $z_*$                              | $1089.75^{+0.49}_{-0.46}$       | $\sigma_8(2.33)$            | $0.3073^{+0.0051}_{-0.0046}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $r_*$                              | $144.81^{+0.49}_{-0.53}$        | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0020}$    | $100\theta_*$                      | $1.04123^{+0.00061}_{-0.00065}$ | $f_{2000}^{217}$            | $106.6^{+3.7}_{-3.7}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.907^{+0.048}_{-0.049}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9965^{+0.010}_{-0.0097}$     | $z_{\text{drag}}$                  | $1059.89^{+0.61}_{-0.61}$       | $\chi_{\text{lensing}}^2$   | $9.46 (\nu: 0.4)$            |
| $c_{EE}$                             | $0.9922^{+0.0096}_{-0.0095}$    | $r_{\text{drag}}$                  | $147.47^{+0.52}_{-0.54}$        | $\chi_{\text{simall}}^2$    | $397.4 (\nu: 2.3)$           |
| $H_0$                                | $67.96^{+0.97}_{-1.0}$          | $k_{\text{D}}$                     | $0.14049^{+0.00064}_{-0.00062}$ | $\chi_{\text{lowl}}^2$      | $22.78 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                   | $0.694^{+0.013}_{-0.014}$       | $100\theta_{\text{D}}$             | $0.16079^{+0.00037}_{-0.00036}$ | $\chi_{\text{CamSpec}}^2$   | $11515.1 (\nu: 16.8)$        |
| $\Omega_{\text{m}}$                  | $0.306^{+0.014}_{-0.013}$       | $z_{\text{eq}}$                    | $3366^{+51}_{-48}$              | $\chi_{\text{H073p45}}^2$   | $11.0 (\nu: 2.1)$            |
| $\Omega_{\text{m}}h^2$               | $0.1415^{+0.0021}_{-0.0020}$    | $k_{\text{eq}}$                    | $0.01027^{+0.00016}_{-0.00015}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_{\text{m}}h^3$               | $0.09617^{+0.00060}_{-0.00061}$ | $100\theta_{\text{eq}}$            | $0.8200^{+0.0096}_{-0.0096}$    | $\chi_{\text{CMB}}^2$       | $11944.8 (\nu: 19.6)$        |
| $\sigma_8$                           | $0.808^{+0.012}_{-0.012}$       | $100\theta_{\text{s,eq}}$          | $0.4529^{+0.0049}_{-0.0049}$    |                             |                              |
| $S_8$                                | $0.816^{+0.024}_{-0.023}$       | $H(0.15)$                          | $73.19^{+0.83}_{-0.87}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11963.63; R - 1 = 0.02452$$



## 2.54 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_Riess18

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                        | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|-----------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02240^{+0.00027}_{-0.00028}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.011}_{-0.010}$         | $D_{\mathrm{M}}(0.38)$      | $1523^{+14}_{-13}$           |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1184^{+0.0018}_{-0.0017}$    | $\sigma_8/h^{0.5}$                   | $0.979^{+0.017}_{-0.015}$         | $H(0.51)$                   | $89.90^{+0.41}_{-0.42}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04106^{+0.00058}_{-0.00060}$ | $r_{\mathrm{drag}}h$                 | $100.3^{+1.3}_{-1.4}$             | $D_{\mathrm{M}}(0.51)$      | $1973^{+16}_{-15}$           |
| $\tau$                                   | $0.057^{+0.016}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$          | $2.423^{+0.039}_{-0.037}$         | $H(0.61)$                   | $95.47^{+0.34}_{-0.35}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.046^{+0.030}_{-0.029}$       | $z_{\mathrm{re}}$                    | $7.9^{+1.5}_{-1.4}$               | $D_{\mathrm{M}}(0.61)$      | $2297^{+17}_{-17}$           |
| $n_{\mathrm{s}}$                         | $0.9688^{+0.0074}_{-0.0075}$    | $10^9 A_{\mathrm{s}}$                | $2.103^{+0.064}_{-0.059}$         | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{\mathrm{cal}}$                       | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.875^{+0.020}_{-0.019}$         | $D_{\mathrm{M}}(2.33)$      | $5756^{+17}_{-16}$           |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{40}$                             | $1223^{+23}_{-22}$                | $f\sigma_8(0.15)$           | $0.452^{+0.010}_{-0.0096}$   |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                            | $5733^{+74}_{-75}$                | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{810}$                            | $2537^{+26}_{-26}$                | $f\sigma_8(0.38)$           | $0.4711^{+0.0089}_{-0.0085}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                           | $817.3^{+9.0}_{-9.3}$             | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0093}$   |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.67$                        | $D_{2000}$                           | $230.9^{+3.0}_{-3.2}$             | $f\sigma_8(0.51)$           | $0.4704^{+0.0083}_{-0.0077}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.67^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9688^{+0.0074}_{-0.0075}$      | $\sigma_8(0.51)$            | $0.6203^{+0.0095}_{-0.0088}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.245407^{+0.000098}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4659^{+0.0077}_{-0.0073}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.246734^{+0.000099}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5904^{+0.0091}_{-0.0085}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.580^{+0.052}_{-0.048}$         | $f\sigma_8(2.33)$           | $0.2979^{+0.0047}_{-0.0043}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.36}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.783^{+0.039}_{-0.037}$        | $\sigma_8(2.33)$            | $0.3074^{+0.0050}_{-0.0046}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.33}_{-0.33}$          | $z_*$                                | $1089.73^{+0.42}_{-0.40}$         | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.21}_{-0.21}$          | $r_*$                                | $144.83^{+0.44}_{-0.44}$          | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.7}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04124^{+0.00058}_{-0.00060}$   | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.909^{+0.043}_{-0.043}$        | $\chi_{\mathrm{lensing}}^2$ | $9.45 (\nu: 0.4)$            |
| $c_{217}$                                | $1.0011^{+0.0032}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.90^{+0.61}_{-0.61}$         | $\chi_{\mathrm{simall}}^2$  | $397.4 (\nu: 2.2)$           |
| $c_{TE}$                                 | $0.9965^{+0.010}_{-0.0099}$     | $r_{\mathrm{drag}}$                  | $147.49^{+0.48}_{-0.47}$          | $\chi_{\mathrm{lowl}}^2$    | $22.72 (\nu: 0.3)$           |
| $c_{EE}$                                 | $0.9923^{+0.0095}_{-0.0095}$    | $k_{\mathrm{D}}$                     | $0.14048^{+0.00061}_{-0.00058}$   | $\chi_{\mathrm{CamSpec}}^2$ | $11515.0 (\nu: 16.1)$        |
| $H_0$                                    | $68.01^{+0.77}_{-0.80}$         | $100\theta_{\mathrm{D}}$             | $0.16079^{+0.00036}_{-0.00035}$   | $\chi_{\mathrm{H073p45}}^2$ | $10.8 (\nu: 1.2)$            |
| $\Omega_{\Lambda}$                       | $0.694^{+0.010}_{-0.011}$       | $z_{\mathrm{eq}}$                    | $3364^{+41}_{-40}$                | $\chi_{6\mathrm{DF}}^2$     | $0.021 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.011}_{-0.010}$       | $k_{\mathrm{eq}}$                    | $0.01027^{+0.00013}_{-0.00012}$   | $\chi_{\mathrm{MGS}}^2$     | $1.64 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1414^{+0.0017}_{-0.0017}$    | $100\theta_{\mathrm{eq}}$            | $0.8204^{+0.0074}_{-0.0077}$      | $\chi_{\mathrm{DR12BAO}}^2$ | $3.92 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}}h^3$                 | $0.09617^{+0.00059}_{-0.00061}$ | $100\theta_{\mathrm{s,eq}}$          | $0.4531^{+0.0039}_{-0.0040}$      | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.012}$       | $H(0.15)$                            | $73.23^{+0.66}_{-0.69}$           | $\chi_{\mathrm{CMB}}^2$     | $11944.6 (\nu: 17.8)$        |
| $S_8$                                    | $0.815^{+0.020}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$               | $637.9^{+6.8}_{-6.5}$             | $\chi_{\mathrm{BAO}}^2$     | $5.58 (\nu: 0.1)$            |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.447^{+0.011}_{-0.0099}$      | $H(0.38)$                            | $83.24^{+0.50}_{-0.51}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11968.81; R - 1 = 0.02105$$



## 2.55 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022311 | $0.02231^{+0.00029}_{-0.00030}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4521   | $0.452^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | 642.2    | $642.3^{+8.6}_{-8.4}$        |
| $\Omega_c h^2$              | 0.11940  | $0.1194^{+0.0022}_{-0.0022}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6047   | $0.605^{+0.012}_{-0.012}$       | $H(0.38)$                   | 82.92    | $82.92^{+0.63}_{-0.63}$      |
| $100\theta_{MC}$            | 1.04088  | $1.04090^{+0.00060}_{-0.00061}$ | $\sigma_8/h^{0.5}$          | 0.9844   | $0.984^{+0.018}_{-0.017}$       | $D_M(0.38)$                 | 1531.3   | $1531^{+17}_{-17}$           |
| $\tau$                      | 0.0544   | $0.054^{+0.015}_{-0.014}$       | $r_{drag}h$                 | 99.45    | $99.4^{+1.7}_{-1.7}$            | $H(0.51)$                   | 89.65    | $89.65^{+0.51}_{-0.50}$      |
| $\ln(10^{10} A_s)$          | 3.0418   | $3.042^{+0.029}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$ | 2.4343   | $2.435^{+0.043}_{-0.041}$       | $D_M(0.51)$                 | 1983.5   | $1984^{+20}_{-20}$           |
| $n_s$                       | 0.9664   | $0.9662^{+0.0081}_{-0.0079}$    | $z_{re}$                    | 7.69     | $7.7^{+1.5}_{-1.4}$             | $H(0.61)$                   | 95.271   | $95.27^{+0.41}_{-0.41}$      |
| $y_{cal}$                   | 1.00056  | $1.0006^{+0.0050}_{-0.0049}$    | $10^9 A_s$                  | 2.094    | $2.094^{+0.062}_{-0.057}$       | $D_M(0.61)$                 | 2308.0   | $2308^{+22}_{-21}$           |
| $A_{100}^{PS}$              | 234.0    | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8785   | $1.878^{+0.021}_{-0.020}$       | $H(2.33)$                   | 236.10   | $236.1^{+1.4}_{-1.3}$        |
| $A_{143}^{PS}$              | 41.2     | $39^{+20}_{-20}$                | $D_{40}$                    | 1225.9   | $1226^{+23}_{-23}$              | $D_M(2.33)$                 | 5765.3   | $5765^{+20}_{-19}$           |
| $A_{217}^{PS}$              | 102.2    | $103^{+30}_{-30}$               | $D_{220}$                   | 5722     | $5722^{+76}_{-78}$              | $f\sigma_8(0.15)$           | 0.4566   | $0.457^{+0.012}_{-0.012}$    |
| $A_{217}^{CIB}$             | 44.3     | $40^{+10}_{-10}$                | $D_{810}$                   | 2535.9   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | 0.7473   | $0.747^{+0.011}_{-0.010}$    |
| $A_{143}^{tSZ}$             | 6.54     | $< 7.51$                        | $D_{1420}$                  | 816.2    | $816.0^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$           | 0.4747   | $0.475^{+0.010}_{-0.0099}$   |
| $r_{143 \times 217}^{PS}$   | 0.612    | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | 230.41   | $230.3^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | 0.6623   | $0.6623^{+0.0096}_{-0.0089}$ |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | $n_{s,0.002}$               | 0.9664   | $0.9662^{+0.0081}_{-0.0079}$    | $f\sigma_8(0.51)$           | 0.4732   | $0.4732^{+0.0089}_{-0.0089}$ |
| $\xi^{tSZ \times CIB}$      | 0.18     | —                               | $Y_P$                       | 0.245372 | $0.24537^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | 0.6198   | $0.6197^{+0.0091}_{-0.0084}$ |
| $A^{kSZ}$                   | 0.1      | —                               | $Y_P^{BBN}$                 | 0.246698 | $0.24670^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4681   | $0.4681^{+0.0081}_{-0.0082}$ |
| $A_{100}^{dust}$            | 1.004    | $1.01^{+0.38}_{-0.39}$          | $10^5 D/H$                  | 2.597    | $2.597^{+0.057}_{-0.053}$       | $\sigma_8(0.61)$            | 0.5897   | $0.5896^{+0.0086}_{-0.0080}$ |
| $A_{143}^{dust}$            | 0.969    | $0.96^{+0.33}_{-0.34}$          | Age/Gyr                     | 13.8020  | $13.802^{+0.045}_{-0.043}$      | $f\sigma_8(2.33)$           | 0.29731  | $0.2973^{+0.0045}_{-0.0041}$ |
| $A_{217}^{dust}$            | 0.972    | $0.97^{+0.21}_{-0.21}$          | $z_*$                       | 1089.941 | $1089.95^{+0.50}_{-0.48}$       | $\sigma_8(2.33)$            | 0.30647  | $0.3064^{+0.0049}_{-0.0045}$ |
| $A_{143 \times 217}^{dust}$ | 1.006    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.63   | $144.62^{+0.52}_{-0.52}$        | $f_{2000}^{143}$            | 30.0     | $30^{+6}_{-5}$               |
| $c_{100}$                   | 0.99767  | $0.9976^{+0.0021}_{-0.0020}$    | $100\theta_*$               | 1.04107  | $1.04109^{+0.00059}_{-0.00060}$ | $f_{2000}^{217}$            | 106.79   | $106.8^{+3.8}_{-3.8}$        |
| $c_{217}$                   | 1.00131  | $1.0011^{+0.0032}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.8926  | $13.891^{+0.049}_{-0.049}$      | $f_{2000}^{143 \times 217}$ | 32.12    | $32^{+4}_{-4}$               |
| $c_{TE}$                    | 0.9967   | $0.9966^{+0.0097}_{-0.0096}$    | $z_{drag}$                  | 1059.74  | $1059.76^{+0.63}_{-0.67}$       | $\chi_{lensing}^2$          | 8.86     | $9.30 (\nu: 0.3)$            |
| $c_{EE}$                    | 0.9923   | $0.9921^{+0.0097}_{-0.0096}$    | $r_{drag}$                  | 147.32   | $147.31^{+0.54}_{-0.53}$        | $\chi_{small}^2$            | 396.07   | $397.0 (\nu: 1.5)$           |
| $H_0$                       | 67.50    | $67.50^{+0.99}_{-1.0}$          | $k_D$                       | 0.14058  | $0.14060^{+0.00063}_{-0.00065}$ | $\chi_{lowl}^2$             | 23.03    | $23.13 (\nu: 0.3)$           |
| $\Omega_\Lambda$            | 0.6876   | $0.687^{+0.013}_{-0.014}$       | $100\theta_D$               | 0.160852 | $0.16086^{+0.00038}_{-0.00036}$ | $\chi_{CamSpec}^2$          | 11499.5  | $11514.2 (\nu: 15.5)$        |
| $\Omega_m$                  | 0.3124   | $0.313^{+0.014}_{-0.013}$       | $z_{eq}$                    | 3386     | $3387^{+51}_{-50}$              | $\chi_{JLA}^2$              | 1035.10  | $1035.21 (\nu: 0.1)$         |
| $\Omega_m h^2$              | 0.14235  | $0.1424^{+0.0021}_{-0.0021}$    | $k_{eq}$                    | 0.010336 | $0.01034^{+0.00015}_{-0.00015}$ | $\chi_{prior}^2$            | 2.2      | $7.8 (\nu: 6.1)$             |
| $\Omega_m h^3$              | 0.09609  | $0.09611^{+0.00061}_{-0.00062}$ | $100\theta_{eq}$            | 0.8159   | $0.8158^{+0.0096}_{-0.0095}$    | $\chi_{CMB}^2$              | 11927.5  | $11943.6 (\nu: 16.8)$        |
| $\sigma_8$                  | 0.8088   | $0.809^{+0.012}_{-0.012}$       | $100\theta_{s,eq}$          | 0.45080  | $0.4507^{+0.0049}_{-0.0049}$    |                             |          |                              |
| $S_8$                       | 0.8254   | $0.826^{+0.024}_{-0.024}$       | $H(0.15)$                   | 72.79    | $72.79^{+0.85}_{-0.86}$         |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12964.78$ ;  $\bar{\chi}_{eff}^2 = 12986.66$ ;  $R - 1 = 0.01285$

$\chi_{eff}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.86 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.07 commander\_dx12\_v3.2\_29: 23.03 CamSpec like\_10.7HM\_1400\_unified: 11499.55 SN - JLA Pantheon18: 1035.10



## 2.56 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_JLA\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02241^{+0.00028}_{-0.00027}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.600^{+0.011}_{-0.011}$       | $D_M(0.38)$                 | $1522^{+14}_{-13}$           |
| $\Omega_c h^2$              | $0.1183^{+0.0018}_{-0.0017}$    | $\sigma_8/h^{0.5}$          | $0.979^{+0.016}_{-0.015}$       | $H(0.51)$                   | $89.91^{+0.41}_{-0.41}$      |
| $100\theta_{MC}$            | $1.04107^{+0.00054}_{-0.00062}$ | $r_{drag}h$                 | $100.3^{+1.3}_{-1.4}$           | $D_M(0.51)$                 | $1973^{+16}_{-15}$           |
| $\tau$                      | $0.058^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | $2.423^{+0.038}_{-0.038}$       | $H(0.61)$                   | $95.48^{+0.35}_{-0.35}$      |
| $\ln(10^{10} A_s)$          | $3.046^{+0.028}_{-0.029}$       | $z_{re}$                    | $8.0^{+1.4}_{-1.4}$             | $D_M(0.61)$                 | $2297^{+17}_{-16}$           |
| $n_s$                       | $0.9690^{+0.0071}_{-0.0078}$    | $10^9 A_s$                  | $2.104^{+0.060}_{-0.060}$       | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{cal}$                   | $1.0009^{+0.0047}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.020}_{-0.019}$       | $D_M(2.33)$                 | $5756^{+17}_{-17}$           |
| $A_{100}^{PS}$              | $237^{+50}_{-50}$               | $D_{40}$                    | $1222^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.451^{+0.010}_{-0.010}$    |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5732^{+72}_{-74}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{810}$                   | $2537^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4711^{+0.0087}_{-0.0086}$ |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{1420}$                  | $817.5^{+8.8}_{-9.0}$           | $\sigma_8(0.38)$            | $0.6627^{+0.0099}_{-0.0097}$ |
| $A_{143}^{tSZ}$             | $< 7.83$                        | $D_{2000}$                  | $231.0^{+3.0}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.4704^{+0.0079}_{-0.0078}$ |
| $r_{143 \times 217}^{PS}$   | $0.67^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9690^{+0.0071}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.6205^{+0.0094}_{-0.0092}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24541^{+0.00010}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4659^{+0.0074}_{-0.0073}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24673^{+0.00011}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5906^{+0.0090}_{-0.0087}$ |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.579^{+0.052}_{-0.051}$       | $f\sigma_8(2.33)$           | $0.2980^{+0.0045}_{-0.0044}$ |
| $A_{100}^{dust}$            | $1.01^{+0.36}_{-0.38}$          | Age/Gyr                     | $13.782^{+0.039}_{-0.039}$      | $\sigma_8(2.33)$            | $0.3075^{+0.0048}_{-0.0046}$ |
| $A_{143}^{dust}$            | $0.95^{+0.32}_{-0.33}$          | $z_*$                       | $1089.73^{+0.42}_{-0.42}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $144.84^{+0.45}_{-0.44}$        | $f_{2000}^{217}$            | $106.5^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04125^{+0.00054}_{-0.00061}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.045}_{-0.042}$      | $\chi^2_{lensing}$          | $9.46 (\nu: 0.4)$            |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | $1059.90^{+0.65}_{-0.61}$       | $\chi^2_{simall}$           | $397.5 (\nu: 2.2)$           |
| $c_{TE}$                    | $0.996^{+0.010}_{-0.010}$       | $r_{drag}$                  | $147.50^{+0.48}_{-0.48}$        | $\chi^2_{lowl}$             | $22.68 (\nu: 0.3)$           |
| $c_{EE}$                    | $0.9923^{+0.0099}_{-0.0098}$    | $k_D$                       | $0.14047^{+0.00063}_{-0.00060}$ | $\chi^2_{CamSpec}$          | $11515.3 (\nu: 17.8)$        |
| $H_0$                       | $68.03^{+0.76}_{-0.79}$         | $100\theta_D$               | $0.16079^{+0.00035}_{-0.00037}$ | $\chi^2_{H073p45}$          | $10.7 (\nu: 1.2)$            |
| $\Omega_\Lambda$            | $0.6944^{+0.0098}_{-0.011}$     | $z_{eq}$                    | $3363^{+40}_{-40}$              | $\chi^2_{JLA}$              | $706.63 (\nu: 0.0)$          |
| $\Omega_m$                  | $0.306^{+0.011}_{-0.0098}$      | $k_{eq}$                    | $0.01026^{+0.00012}_{-0.00012}$ | $\chi^2_{6DF}$              | $0.021 (\nu: 0.0)$           |
| $\Omega_m h^2$              | $0.1414^{+0.0017}_{-0.0017}$    | $100\theta_{eq}$            | $0.8206^{+0.0075}_{-0.0076}$    | $\chi^2_{MGS}$              | $1.66 (\nu: 0.1)$            |
| $\Omega_m h^3$              | $0.09617^{+0.00064}_{-0.00062}$ | $100\theta_{s,eq}$          | $0.4532^{+0.0038}_{-0.0039}$    | $\chi^2_{DR12BAO}$          | $3.89 (\nu: 0.2)$            |
| $\sigma_8$                  | $0.808^{+0.012}_{-0.012}$       | $H(0.15)$                   | $73.24^{+0.68}_{-0.68}$         | $\chi^2_{prior}$            | $7.7 (\nu: 5.6)$             |
| $S_8$                       | $0.815^{+0.020}_{-0.019}$       | $D_M(0.15)$                 | $637.7^{+6.7}_{-6.5}$           | $\chi^2_{CMB}$              | $11944.9 (\nu: 19.5)$        |
| $\sigma_8 \Omega_m^{0.5}$   | $0.446^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.25^{+0.50}_{-0.50}$         | $\chi^2_{BAO}$              | $5.57 (\nu: 0.1)$            |

$$\bar{\chi}^2_{eff} = 12675.57; R - 1 = 0.05190$$



## 2.57 base\_CamSpecHM\_TTTEE\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022352 | $0.02234^{+0.00027}_{-0.00028}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6027   | $0.603^{+0.011}_{-0.011}$       | $D_M(0.38)$                 | 1528.0   | $1528^{+14}_{-14}$           |
| $\Omega_c h^2$              | 0.11901  | $0.1190^{+0.0018}_{-0.0018}$    | $\sigma_8/h^{0.5}$          | 0.9818   | $0.982^{+0.016}_{-0.016}$       | $H(0.51)$                   | 89.742   | $89.75^{+0.41}_{-0.42}$      |
| $100\theta_{MC}$            | 1.04094  | $1.04096^{+0.00057}_{-0.00059}$ | $r_{drag}h$                 | 99.76    | $99.8^{+1.4}_{-1.4}$            | $D_M(0.51)$                 | 1979.7   | $1979^{+17}_{-16}$           |
| $\tau$                      | 0.0546   | $0.056^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | 2.4271   | $2.429^{+0.039}_{-0.039}$       | $H(0.61)$                   | 95.348   | $95.35^{+0.35}_{-0.36}$      |
| $\ln(10^{10} A_s)$          | 3.0417   | $3.043^{+0.029}_{-0.028}$       | $z_{re}$                    | 7.70     | $7.8^{+1.5}_{-1.4}$             | $D_M(0.61)$                 | 2303.8   | $2303^{+18}_{-17}$           |
| $n_s$                       | 0.9678   | $0.9673^{+0.0075}_{-0.0074}$    | $10^9 A_s$                  | 2.094    | $2.098^{+0.062}_{-0.057}$       | $H(2.33)$                   | 235.89   | $235.8^{+1.1}_{-1.1}$        |
| $y_{cal}$                   | 1.00063  | $1.0007^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8776   | $1.877^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | 5761.8   | $5762^{+18}_{-16}$           |
| $A_{100}^{PS}$              | 231.5    | $239^{+50}_{-50}$               | $D_{40}$                    | 1223.2   | $1225^{+23}_{-22}$              | $f\sigma_8(0.15)$           | 0.4544   | $0.454^{+0.010}_{-0.010}$    |
| $A_{143}^{PS}$              | 47.8     | $39^{+20}_{-20}$                | $D_{220}$                   | 5724     | $5726^{+75}_{-78}$              | $\sigma_8(0.15)$            | 0.7466   | $0.747^{+0.011}_{-0.010}$    |
| $A_{217}^{PS}$              | 104.1    | $103^{+30}_{-30}$               | $D_{810}$                   | 2537.0   | $2536^{+26}_{-26}$              | $f\sigma_8(0.38)$           | 0.4730   | $0.4731^{+0.0090}_{-0.0091}$ |
| $A_{217}^{CIB}$             | 42.7     | $40^{+10}_{-10}$                | $D_{1420}$                  | 817.1    | $816.5^{+9.5}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6620   | $0.6623^{+0.0098}_{-0.0090}$ |
| $A_{143}^{tSZ}$             | 6.37     | $< 7.58$                        | $D_{2000}$                  | 230.78   | $230.5^{+3.1}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4718   | $0.4719^{+0.0081}_{-0.0081}$ |
| $r_{143 \times 217}^{PS}$   | 0.695    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9678   | $0.9673^{+0.0075}_{-0.0074}$    | $\sigma_8(0.51)$            | 0.6196   | $0.6199^{+0.0092}_{-0.0085}$ |
| $r_{143 \times 217}^{CIB}$  | 0.87     | —                               | $Y_P$                       | 0.245389 | $0.24538^{+0.00010}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4670   | $0.4671^{+0.0076}_{-0.0076}$ |
| $\xi^{tSZ \times CIB}$      | 0.64     | —                               | $Y_P^{BBN}$                 | 0.246715 | $0.24671^{+0.00010}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5896   | $0.5899^{+0.0088}_{-0.0081}$ |
| $A^{kSZ}$                   | 0.3      | —                               | $10^5 D/H$                  | 2.589    | $2.591^{+0.054}_{-0.049}$       | $f\sigma_8(2.33)$           | 0.29735  | $0.2975^{+0.0045}_{-0.0041}$ |
| $A_{100}^{dust}$            | 1.013    | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | 13.7944  | $13.794^{+0.040}_{-0.038}$      | $\sigma_8(2.33)$            | 0.30662  | $0.3068^{+0.0048}_{-0.0043}$ |
| $A_{143}^{dust}$            | 0.980    | $0.95^{+0.33}_{-0.33}$          | $z_*$                       | 1089.855 | $1089.86^{+0.44}_{-0.42}$       | $f_{2000}^{143}$            | 29.8     | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | 0.979    | $0.97^{+0.22}_{-0.21}$          | $r_*$                       | 144.701  | $144.72^{+0.45}_{-0.45}$        | $f_{2000}^{217}$            | 106.48   | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | 0.995    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04113  | $1.04115^{+0.00056}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | 31.90    | $32^{+4}_{-4}$               |
| $c_{100}$                   | 0.99779  | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 13.8984  | $13.900^{+0.043}_{-0.043}$      | $\chi_{lensing}^2$          | 8.97     | $9.32 (\nu: 0.3)$            |
| $c_{217}$                   | 1.00131  | $1.0011^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | 1059.82  | $1059.80^{+0.59}_{-0.63}$       | $\chi_{small}^2$            | 396.05   | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                    | 0.9966   | $0.9966^{+0.0096}_{-0.0098}$    | $r_{drag}$                  | 147.374  | $147.40^{+0.48}_{-0.48}$        | $\chi_{lowl}^2$             | 22.77    | $22.94 (\nu: 0.3)$           |
| $c_{EE}$                    | 0.9924   | $0.9923^{+0.0097}_{-0.0095}$    | $k_D$                       | 0.14056  | $0.14052^{+0.00060}_{-0.00061}$ | $\chi_{CamSpec}^2$          | 11500.2  | $11514.3 (\nu: 15.5)$        |
| $H_0$                       | 67.69    | $67.72^{+0.79}_{-0.81}$         | $100\theta_D$               | 0.160819 | $0.16084^{+0.00037}_{-0.00035}$ | $\chi_{JLA}^2$              | 1034.980 | $1035.03 (\nu: 0.0)$         |
| $\Omega_\Lambda$            | 0.6901   | $0.690^{+0.010}_{-0.011}$       | $z_{eq}$                    | 3378.1   | $3377^{+41}_{-41}$              | $\chi_{6DF}^2$              | 0.022    | $0.040 (\nu: 0.0)$           |
| $\Omega_m$                  | 0.3099   | $0.310^{+0.011}_{-0.010}$       | $k_{eq}$                    | 0.010310 | $0.01031^{+0.00013}_{-0.00012}$ | $\chi_{MGS}^2$              | 1.28     | $1.36 (\nu: 0.1)$            |
| $\Omega_m h^2$              | 0.14201  | $0.1419^{+0.0017}_{-0.0017}$    | $100\theta_{eq}$            | 0.8176   | $0.8179^{+0.0076}_{-0.0077}$    | $\chi_{DR12BAO}^2$          | 4.23     | $4.5 (\nu: 0.7)$             |
| $\Omega_m h^3$              | 0.09613  | $0.09612^{+0.00061}_{-0.00063}$ | $100\theta_{s,eq}$          | 0.45163  | $0.4518^{+0.0039}_{-0.0039}$    | $\chi_{prior}^2$            | 2.0      | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                  | 0.8078   | $0.808^{+0.012}_{-0.011}$       | $H(0.15)$                   | 72.96    | $72.98^{+0.68}_{-0.70}$         | $\chi_{CMB}^2$              | 11928.0  | $11943.7 (\nu: 16.7)$        |
| $S_8$                       | 0.8210   | $0.821^{+0.020}_{-0.020}$       | $D_M(0.15)$                 | 640.5    | $640.4^{+7.0}_{-6.7}$           | $\chi_{BAO}^2$              | 5.53     | $5.88 (\nu: 0.4)$            |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4497   | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | 83.04    | $83.05^{+0.50}_{-0.52}$         |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12970.49$ ;  $\bar{\chi}_{eff}^2 = 12992.39$ ;  $R - 1 = 0.01438$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.02 MGS: 1.28 DR12BAO: 4.23 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.97 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.05 comman-  
der\_dx12\_v3\_2\_29: 22.77 CamSpec like\_10.7HM\_1400\_unified: 11500.17 SN - JLA Pantheon18: 1034.98



## 2.58 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                        | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|-----------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02241^{+0.00026}_{-0.00027}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.600^{+0.011}_{-0.010}$         | $D_M(0.38)$                 | $1522^{+13}_{-13}$           |
| $\Omega_c h^2$              | $0.1183^{+0.0017}_{-0.0017}$    | $\sigma_8/h^{0.5}$          | $0.979^{+0.016}_{-0.015}$         | $H(0.51)$                   | $89.91^{+0.40}_{-0.41}$      |
| $100\theta_{MC}$            | $1.04107^{+0.00057}_{-0.00060}$ | $r_{drag}h$                 | $100.4^{+1.3}_{-1.3}$             | $D_M(0.51)$                 | $1973^{+16}_{-15}$           |
| $\tau$                      | $0.057^{+0.016}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | $2.423^{+0.039}_{-0.038}$         | $H(0.61)$                   | $95.48^{+0.34}_{-0.35}$      |
| $\ln(10^{10} A_s)$          | $3.046^{+0.030}_{-0.029}$       | $z_{re}$                    | $7.9^{+1.5}_{-1.4}$               | $D_M(0.61)$                 | $2296^{+17}_{-16}$           |
| $n_s$                       | $0.9689^{+0.0073}_{-0.0074}$    | $10^9 A_s$                  | $2.104^{+0.064}_{-0.060}$         | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{cal}$                   | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.020}_{-0.019}$         | $D_M(2.33)$                 | $5756^{+17}_{-16}$           |
| $A_{100}^{PS}$              | $237^{+50}_{-50}$               | $D_{40}$                    | $1223^{+23}_{-22}$                | $f\sigma_8(0.15)$           | $0.451^{+0.010}_{-0.0093}$   |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5733^{+74}_{-75}$                | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{810}$                   | $2537^{+26}_{-26}$                | $f\sigma_8(0.38)$           | $0.4709^{+0.0088}_{-0.0084}$ |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{1420}$                  | $817.4^{+8.9}_{-9.3}$             | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0093}$   |
| $A_{143}^{tSZ}$             | $< 7.70$                        | $D_{2000}$                  | $230.9^{+3.0}_{-3.2}$             | $f\sigma_8(0.51)$           | $0.4702^{+0.0081}_{-0.0077}$ |
| $r_{143 \times 217}^{PS}$   | $0.67^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9689^{+0.0073}_{-0.0074}$      | $\sigma_8(0.51)$            | $0.6203^{+0.0095}_{-0.0088}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.245409^{+0.000098}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4658^{+0.0077}_{-0.0073}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.246736^{+0.000098}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5904^{+0.0092}_{-0.0085}$ |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.579^{+0.051}_{-0.047}$         | $f\sigma_8(2.33)$           | $0.2980^{+0.0047}_{-0.0044}$ |
| $A_{100}^{dust}$            | $1.01^{+0.36}_{-0.39}$          | Age/Gyr                     | $13.782^{+0.039}_{-0.037}$        | $\sigma_8(2.33)$            | $0.3074^{+0.0050}_{-0.0046}$ |
| $A_{143}^{dust}$            | $0.95^{+0.33}_{-0.33}$          | $z_*$                       | $1089.72^{+0.42}_{-0.39}$         | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | $0.98^{+0.21}_{-0.21}$          | $r_*$                       | $144.84^{+0.43}_{-0.43}$          | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.7}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04125^{+0.00058}_{-0.00060}$   | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.042}_{-0.042}$        | $\chi_{lensing}^2$          | $9.47 (\nu: 0.4)$            |
| $c_{217}$                   | $1.0011^{+0.0032}_{-0.0031}$    | $z_{drag}$                  | $1059.90^{+0.60}_{-0.62}$         | $\chi_{simall}^2$           | $397.5 (\nu: 2.3)$           |
| $c_{TE}$                    | $0.9965^{+0.010}_{-0.0099}$     | $r_{drag}$                  | $147.50^{+0.47}_{-0.47}$          | $\chi_{lowl}^2$             | $22.70 (\nu: 0.3)$           |
| $c_{EE}$                    | $0.9923^{+0.0095}_{-0.0095}$    | $k_D$                       | $0.14047^{+0.00060}_{-0.00057}$   | $\chi_{CamSpec}^2$          | $11515.1 (\nu: 16.1)$        |
| $H_0$                       | $68.04^{+0.74}_{-0.78}$         | $100\theta_D$               | $0.16078^{+0.00036}_{-0.00035}$   | $\chi_{H073p45}^2$          | $10.7 (\nu: 1.2)$            |
| $\Omega_\Lambda$            | $0.6946^{+0.0097}_{-0.010}$     | $z_{eq}$                    | $3363^{+40}_{-39}$                | $\chi_{JLA}^2$              | $1034.87 (\nu: 0.0)$         |
| $\Omega_m$                  | $0.305^{+0.010}_{-0.0097}$      | $k_{eq}$                    | $0.01026^{+0.00012}_{-0.00012}$   | $\chi_{6DF}^2$              | $0.019 (\nu: 0.0)$           |
| $\Omega_m h^2$              | $0.1414^{+0.0017}_{-0.0016}$    | $100\theta_{eq}$            | $0.8207^{+0.0072}_{-0.0075}$      | $\chi_{MGS}^2$              | $1.67 (\nu: 0.1)$            |
| $\Omega_m h^3$              | $0.09617^{+0.00059}_{-0.00061}$ | $100\theta_{s,eq}$          | $0.4532^{+0.0037}_{-0.0038}$      | $\chi_{DR12BAO}^2$          | $3.87 (\nu: 0.2)$            |
| $\sigma_8$                  | $0.807^{+0.012}_{-0.012}$       | $H(0.15)$                   | $73.25^{+0.64}_{-0.67}$           | $\chi_{prior}^2$            | $7.8 (\nu: 5.9)$             |
| $S_8$                       | $0.815^{+0.020}_{-0.018}$       | $D_M(0.15)$                 | $637.7^{+6.7}_{-6.2}$             | $\chi_{CMB}^2$              | $11944.7 (\nu: 17.8)$        |
| $\sigma_8 \Omega_m^{0.5}$   | $0.446^{+0.011}_{-0.0098}$      | $H(0.38)$                   | $83.26^{+0.48}_{-0.50}$           | $\chi_{BAO}^2$              | $5.56 (\nu: 0.1)$            |

$$\bar{\chi}_{\text{eff}}^2 = 13003.64; R - 1 = 0.02217$$



## 2.59 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02230^{+0.00030}_{-0.00030}$ | $S_8$                       | $0.828^{+0.026}_{-0.025}$       | $100\theta_{s,eq}$          | $0.4503^{+0.0051}_{-0.0050}$ |
| $\Omega_c h^2$              | $0.1196^{+0.0023}_{-0.0023}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.013}$       | $H(0.15)$                   | $72.72^{+0.88}_{-0.89}$      |
| $100\theta_{MC}$            | $1.04087^{+0.00061}_{-0.00061}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.013}_{-0.012}$       | $D_M(0.15)$                 | $642.9^{+9.0}_{-8.7}$        |
| $\tau$                      | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.017}$       | $H(0.38)$                   | $82.87^{+0.65}_{-0.65}$      |
| $\ln(10^{10} A_s)$          | $3.043^{+0.026}_{-0.024}$       | $r_{drag} h$                | $99.3^{+1.8}_{-1.8}$            | $D_M(0.38)$                 | $1533^{+18}_{-17}$           |
| $n_s$                       | $0.9658^{+0.0081}_{-0.0081}$    | $\langle d^2 \rangle^{1/2}$ | $2.439^{+0.043}_{-0.042}$       | $H(0.51)$                   | $89.61^{+0.52}_{-0.52}$      |
| $y_{cal}$                   | $1.0005^{+0.0050}_{-0.0049}$    | $z_{re}$                    | $< 8.88$                        | $D_M(0.51)$                 | $1985^{+21}_{-20}$           |
| $A_{100}^{PS}$              | $239^{+50}_{-50}$               | $10^9 A_s$                  | $2.096^{+0.055}_{-0.050}$       | $H(0.61)$                   | $95.24^{+0.42}_{-0.43}$      |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.021}_{-0.021}$       | $D_M(0.61)$                 | $2310^{+23}_{-22}$           |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1227^{+24}_{-23}$              | $H(2.33)$                   | $236.2^{+1.4}_{-1.4}$        |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{220}$                   | $5720^{+77}_{-77}$              | $D_M(2.33)$                 | $5766^{+20}_{-20}$           |
| $A_{143}^{tSZ}$             | $< 7.50$                        | $D_{810}$                   | $2535^{+26}_{-26}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.26}_{-0.25}$          | $D_{1420}$                  | $815.7^{+9.5}_{-9.4}$           | $\sigma_8(0.15)$            | $0.748^{+0.010}_{-0.0093}$   |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.3^{+3.3}_{-3.2}$           | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9658^{+0.0081}_{-0.0081}$    | $\sigma_8(0.38)$            | $0.6628^{+0.0087}_{-0.0082}$ |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24537^{+0.00011}_{-0.00013}$ | $f\sigma_8(0.51)$           | $0.4741^{+0.0091}_{-0.0088}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.39}$          | $Y_P^{BBN}$                 | $0.24669^{+0.00011}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6202^{+0.0082}_{-0.0076}$ |
| $A_{143}^{dust}$            | $0.96^{+0.34}_{-0.35}$          | $10^5 D/H$                  | $2.599^{+0.058}_{-0.054}$       | $f\sigma_8(0.61)$           | $0.4689^{+0.0082}_{-0.0079}$ |
| $A_{217}^{dust}$            | $0.97^{+0.21}_{-0.21}$          | $Age/Gyr$                   | $13.804^{+0.045}_{-0.045}$      | $\sigma_8(0.61)$            | $0.5900^{+0.0078}_{-0.0072}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | $1089.98^{+0.51}_{-0.50}$       | $f\sigma_8(2.33)$           | $0.2974^{+0.0040}_{-0.0037}$ |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                       | $144.58^{+0.53}_{-0.52}$        | $\sigma_8(2.33)$            | $0.3065^{+0.0043}_{-0.0040}$ |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | $1.04107^{+0.00060}_{-0.00061}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{TE}$                    | $0.9965^{+0.0095}_{-0.0095}$    | $D_M(z_*)/Gpc$              | $13.888^{+0.050}_{-0.049}$      | $f_{2000}^{217}$            | $106.9^{+3.7}_{-3.8}$        |
| $c_{EE}$                    | $0.9921^{+0.0096}_{-0.0095}$    | $z_{drag}$                  | $1059.74^{+0.61}_{-0.65}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$                       | $67.4^{+1.0}_{-1.0}$            | $r_{drag}$                  | $147.27^{+0.55}_{-0.54}$        | $\chi_{lensing}^2$          | $9.26 (\nu: 0.2)$            |
| $\Omega_\Lambda$            | $0.686^{+0.014}_{-0.014}$       | $k_D$                       | $0.14062^{+0.00063}_{-0.00064}$ | $\chi_{simall}^2$           | $396.9 (\nu: 1.4)$           |
| $\Omega_m$                  | $0.314^{+0.014}_{-0.014}$       | $100\theta_D$               | $0.16086^{+0.00038}_{-0.00037}$ | $\chi_{lowl}^2$             | $23.21 (\nu: 0.4)$           |
| $\Omega_m h^2$              | $0.1426^{+0.0022}_{-0.0022}$    | $z_{eq}$                    | $3391^{+52}_{-52}$              | $\chi_{CamSpec}^2$          | $11514.0 (\nu: 15.1)$        |
| $\Omega_m h^3$              | $0.09611^{+0.00061}_{-0.00062}$ | $k_{eq}$                    | $0.01035^{+0.00016}_{-0.00016}$ | $\chi_{prior}^2$            | $7.9 (\nu: 6.0)$             |
| $\sigma_8$                  | $0.810^{+0.011}_{-0.011}$       | $100\theta_{eq}$            | $0.8150^{+0.0098}_{-0.0098}$    | $\chi_{CMB}^2$              | $11943.4 (\nu: 16.0)$        |

$$\bar{\chi}_{eff}^2 = 11951.25; R - 1 = 0.00847$$



## 2.60 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02234^{+0.00028}_{-0.00029}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.604^{+0.011}_{-0.011}$       | $D_{\text{M}}(0.38)$        | $1528^{+14}_{-14}$           |
| $\Omega_{\text{c}}h^2$               | $0.1190^{+0.0018}_{-0.0018}$    | $\sigma_8/h^{0.5}$                 | $0.983^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.73^{+0.42}_{-0.43}$      |
| $100\theta_{\text{MC}}$              | $1.04095^{+0.00057}_{-0.00059}$ | $r_{\text{drag}}h$                 | $99.7^{+1.4}_{-1.4}$            | $D_{\text{M}}(0.51)$        | $1980^{+17}_{-16}$           |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$        | $2.432^{+0.039}_{-0.038}$       | $H(0.61)$                   | $95.34^{+0.35}_{-0.37}$      |
| $\ln(10^{10}A_{\text{s}})$           | $3.044^{+0.027}_{-0.025}$       | $z_{\text{re}}$                    | $7.8^{+1.2}_{-1.3}$             | $D_{\text{M}}(0.61)$        | $2304^{+18}_{-18}$           |
| $n_{\text{s}}$                       | $0.9671^{+0.0075}_{-0.0075}$    | $10^9 A_{\text{s}}$                | $2.099^{+0.056}_{-0.052}$       | $H(2.33)$                   | $235.9^{+1.1}_{-1.1}$        |
| $y_{\text{cal}}$                     | $1.0007^{+0.0050}_{-0.0049}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.877^{+0.021}_{-0.020}$       | $D_{\text{M}}(2.33)$        | $5762^{+18}_{-17}$           |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                           | $1225^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                          | $5725^{+76}_{-78}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0093}$   |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                          | $2536^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4737^{+0.0090}_{-0.0087}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                         | $816.3^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6627^{+0.0090}_{-0.0084}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.56$                        | $D_{2000}$                         | $230.5^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4724^{+0.0081}_{-0.0080}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $n_{\text{s},0.002}$               | $0.9671^{+0.0075}_{-0.0075}$    | $\sigma_8(0.51)$            | $0.6202^{+0.0085}_{-0.0079}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24538^{+0.00010}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4676^{+0.0075}_{-0.0073}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24671^{+0.00010}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5902^{+0.0081}_{-0.0075}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$           | $2.592^{+0.055}_{-0.050}$       | $f\sigma_8(2.33)$           | $0.2976^{+0.0041}_{-0.0038}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $\text{Age}/\text{Gyr}$            | $13.796^{+0.041}_{-0.038}$      | $\sigma_8(2.33)$            | $0.3069^{+0.0044}_{-0.0041}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.33}_{-0.33}$          | $z_*$                              | $1089.88^{+0.45}_{-0.42}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.22}_{-0.20}$          | $r_*$                              | $144.70^{+0.45}_{-0.45}$        | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                      | $1.04114^{+0.00056}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0020}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.899^{+0.043}_{-0.043}$      | $\chi_{\text{lensing}}^2$   | $9.26 (\nu: 0.2)$            |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$                  | $1059.79^{+0.60}_{-0.62}$       | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                             | $0.9966^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$                  | $147.38^{+0.48}_{-0.48}$        | $\chi_{\text{lowl}}^2$      | $22.98 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9923^{+0.0096}_{-0.0095}$    | $k_{\text{D}}$                     | $0.14054^{+0.00061}_{-0.00061}$ | $\chi_{\text{CamSpec}}^2$   | $11514.2 (\nu: 15.3)$        |
| $H_0$                                | $67.68^{+0.80}_{-0.83}$         | $100\theta_{\text{D}}$             | $0.16084^{+0.00038}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | $0.045 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.690^{+0.011}_{-0.011}$       | $z_{\text{eq}}$                    | $3379^{+42}_{-41}$              | $\chi_{\text{MGS}}^2$       | $1.32 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.310^{+0.011}_{-0.011}$       | $k_{\text{eq}}$                    | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 0.8)$             |
| $\Omega_{\text{m}}h^2$               | $0.1420^{+0.0018}_{-0.0017}$    | $100\theta_{\text{eq}}$            | $0.8175^{+0.0078}_{-0.0078}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$             |
| $\Omega_{\text{m}}h^3$               | $0.09611^{+0.00061}_{-0.00063}$ | $100\theta_{\text{s,eq}}$          | $0.4516^{+0.0040}_{-0.0040}$    | $\chi_{\text{CMB}}^2$       | $11943.5 (\nu: 16.3)$        |
| $\sigma_8$                           | $0.809^{+0.012}_{-0.010}$       | $H(0.15)$                          | $72.94^{+0.70}_{-0.72}$         | $\chi_{\text{BAO}}^2$       | $5.97 (\nu: 0.5)$            |
| $S_8$                                | $0.822^{+0.021}_{-0.020}$       | $D_{\text{M}}(0.15)$               | $640.7^{+7.2}_{-6.8}$           |                             |                              |
| $\sigma_8\Omega_{\text{m}}^{0.5}$    | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                          | $83.03^{+0.52}_{-0.54}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11957.26; R - 1 = 0.01434$$



## 2.61 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_Riess18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02240^{+0.00028}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.447^{+0.013}_{-0.012}$       | $D_M(0.15)$                 | $638.2^{+8.5}_{-8.1}$        |
| $\Omega_c h^2$                       | $0.1184^{+0.0022}_{-0.0022}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.601^{+0.012}_{-0.011}$       | $H(0.38)$                   | $83.22^{+0.60}_{-0.63}$      |
| $100\theta_{MC}$                     | $1.04105^{+0.00062}_{-0.00066}$ | $\sigma_8/h^{0.5}$          | $0.980^{+0.017}_{-0.016}$       | $D_M(0.38)$                 | $1523^{+17}_{-16}$           |
| $\tau$                               | $0.058^{+0.015}_{-0.013}$       | $r_{\text{drag}} h$         | $100.2^{+1.7}_{-1.7}$           | $H(0.51)$                   | $89.88^{+0.49}_{-0.51}$      |
| $\ln(10^{10} A_s)$                   | $3.047^{+0.028}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$ | $2.425^{+0.041}_{-0.037}$       | $D_M(0.51)$                 | $1974^{+20}_{-19}$           |
| $n_s$                                | $0.9686^{+0.0078}_{-0.0079}$    | $z_{\text{re}}$             | $8.0^{+1.3}_{-1.4}$             | $H(0.61)$                   | $95.46^{+0.42}_{-0.41}$      |
| $y_{\text{cal}}$                     | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | $2.105^{+0.059}_{-0.055}$       | $D_M(0.61)$                 | $2298^{+22}_{-20}$           |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.021}_{-0.020}$       | $H(2.33)$                   | $235.6^{+1.3}_{-1.3}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1223^{+23}_{-23}$              | $D_M(2.33)$                 | $5757^{+20}_{-19}$           |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5732^{+75}_{-76}$              | $f\sigma_8(0.15)$           | $0.452^{+0.012}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2537^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0096}$   |
| $A_{143}^{\text{tSZ}}$               | $< 7.61$                        | $D_{1420}$                  | $817.2^{+9.0}_{-9.4}$           | $f\sigma_8(0.38)$           | $0.4716^{+0.0099}_{-0.0094}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.9^{+3.0}_{-3.2}$           | $\sigma_8(0.38)$            | $0.6629^{+0.0097}_{-0.0083}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9686^{+0.0078}_{-0.0079}$    | $f\sigma_8(0.51)$           | $0.4708^{+0.0087}_{-0.0082}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24541^{+0.00011}_{-0.00011}$ | $\sigma_8(0.51)$            | $0.6206^{+0.0092}_{-0.0079}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24673^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4663^{+0.0081}_{-0.0075}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.36}_{-0.38}$          | $10^5 \text{D}/\text{H}$    | $2.580^{+0.055}_{-0.049}$       | $\sigma_8(0.61)$            | $0.5906^{+0.0084}_{-0.0078}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.33}$          | $\text{Age}/\text{Gyr}$     | $13.784^{+0.045}_{-0.044}$      | $f\sigma_8(2.33)$           | $0.2980^{+0.0044}_{-0.0040}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.22}_{-0.20}$          | $z_*$                       | $1089.75^{+0.48}_{-0.46}$       | $\sigma_8(2.33)$            | $0.3075^{+0.0047}_{-0.0043}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | $144.81^{+0.49}_{-0.52}$        | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0020}$    | $100\theta_*$               | $1.04123^{+0.00061}_{-0.00065}$ | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.7}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.908^{+0.048}_{-0.049}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9965^{+0.010}_{-0.0098}$     | $z_{\text{drag}}$           | $1059.89^{+0.61}_{-0.61}$       | $\chi_{\text{lensing}}^2$   | $9.41 (\nu: 0.4)$            |
| $c_{EE}$                             | $0.9922^{+0.0096}_{-0.0095}$    | $r_{\text{drag}}$           | $147.47^{+0.52}_{-0.54}$        | $\chi_{\text{simall}}^2$    | $397.5 (\nu: 2.4)$           |
| $H_0$                                | $67.97^{+0.97}_{-1.0}$          | $k_D$                       | $0.14049^{+0.00064}_{-0.00062}$ | $\chi_{\text{lowl}}^2$      | $22.78 (\nu: 0.3)$           |
| $\Omega_\Lambda$                     | $0.694^{+0.013}_{-0.014}$       | $100\theta_D$               | $0.16079^{+0.00037}_{-0.00036}$ | $\chi_{\text{CamSpec}}^2$   | $11515.1 (\nu: 16.8)$        |
| $\Omega_m$                           | $0.306^{+0.014}_{-0.013}$       | $z_{\text{eq}}$             | $3366^{+50}_{-47}$              | $\chi_{\text{H073p45}}^2$   | $11.0 (\nu: 2.0)$            |
| $\Omega_m h^2$                       | $0.1415^{+0.0021}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01027^{+0.00015}_{-0.00014}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | $0.09617^{+0.00060}_{-0.00061}$ | $100\theta_{\text{eq}}$     | $0.8201^{+0.0095}_{-0.0095}$    | $\chi_{\text{CMB}}^2$       | $11944.7 (\nu: 19.5)$        |
| $\sigma_8$                           | $0.808^{+0.012}_{-0.011}$       | $100\theta_{s,\text{eq}}$   | $0.4529^{+0.0049}_{-0.0048}$    |                             |                              |
| $S_8$                                | $0.816^{+0.024}_{-0.023}$       | $H(0.15)$                   | $73.20^{+0.83}_{-0.86}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11963.51; R - 1 = 0.02593$$



## 2.62 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                        | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|-----------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02241^{+0.00026}_{-0.00028}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.601^{+0.011}_{-0.010}$         | $D_{\mathrm{M}}(0.38)$      | $1523^{+14}_{-13}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1184^{+0.0018}_{-0.0017}$    | $\sigma_8/h^{0.5}$                    | $0.980^{+0.016}_{-0.015}$         | $H(0.51)$                   | $89.90^{+0.41}_{-0.42}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04106^{+0.00057}_{-0.00060}$ | $r_{\mathrm{drag}} h$                 | $100.3^{+1.3}_{-1.4}$             | $D_{\mathrm{M}}(0.51)$      | $1973^{+16}_{-15}$           |
| $\tau$                                   | $0.058^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.424^{+0.039}_{-0.036}$         | $H(0.61)$                   | $95.48^{+0.35}_{-0.35}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.047^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                     | $8.0^{+1.3}_{-1.3}$               | $D_{\mathrm{M}}(0.61)$      | $2297^{+17}_{-16}$           |
| $n_{\mathrm{s}}$                         | $0.9688^{+0.0073}_{-0.0075}$    | $10^9 A_{\mathrm{s}}$                 | $2.105^{+0.059}_{-0.055}$         | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{\mathrm{cal}}$                       | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.875^{+0.020}_{-0.019}$         | $D_{\mathrm{M}}(2.33)$      | $5756^{+17}_{-16}$           |
| $A_{100}^{\mathrm{PS}}$                  | $237^{+50}_{-50}$               | $D_{40}$                              | $1223^{+23}_{-22}$                | $f\sigma_8(0.15)$           | $0.452^{+0.010}_{-0.0094}$   |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5733^{+75}_{-75}$                | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0095}$   |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{810}$                             | $2537^{+26}_{-26}$                | $f\sigma_8(0.38)$           | $0.4712^{+0.0088}_{-0.0082}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $817.3^{+9.0}_{-9.3}$             | $\sigma_8(0.38)$            | $0.6628^{+0.0097}_{-0.0084}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.67$                        | $D_{2000}$                            | $230.9^{+3.0}_{-3.2}$             | $f\sigma_8(0.51)$           | $0.4705^{+0.0082}_{-0.0075}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.67^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9688^{+0.0073}_{-0.0075}$      | $\sigma_8(0.51)$            | $0.6206^{+0.0093}_{-0.0079}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.245408^{+0.000098}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4660^{+0.0076}_{-0.0071}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.246734^{+0.000098}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5906^{+0.0085}_{-0.0079}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.579^{+0.052}_{-0.047}$         | $f\sigma_8(2.33)$           | $0.2980^{+0.0043}_{-0.0040}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.36}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.783^{+0.039}_{-0.037}$        | $\sigma_8(2.33)$            | $0.3075^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.33}_{-0.33}$          | $z_*$                                 | $1089.73^{+0.42}_{-0.40}$         | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                 | $144.83^{+0.44}_{-0.44}$          | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.7}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04124^{+0.00058}_{-0.00060}$   | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.909^{+0.043}_{-0.043}$        | $\chi_{\mathrm{lensing}}^2$ | $9.40 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.90^{+0.60}_{-0.62}$         | $\chi_{\mathrm{simall}}^2$  | $397.4 (\nu: 2.3)$           |
| $c_{TE}$                                 | $0.9965^{+0.010}_{-0.0099}$     | $r_{\mathrm{drag}}$                   | $147.49^{+0.47}_{-0.47}$          | $\chi_{\mathrm{lowl}}^2$    | $22.73 (\nu: 0.3)$           |
| $c_{EE}$                                 | $0.9922^{+0.0095}_{-0.0095}$    | $k_{\mathrm{D}}$                      | $0.14048^{+0.00061}_{-0.00057}$   | $\chi_{\mathrm{CamSpec}}^2$ | $11515.0 (\nu: 16.0)$        |
| $H_0$                                    | $68.01^{+0.77}_{-0.80}$         | $100\theta_{\mathrm{D}}$              | $0.16078^{+0.00036}_{-0.00035}$   | $\chi_{\mathrm{H073p45}}^2$ | $10.8 (\nu: 1.2)$            |
| $\Omega_{\Lambda}$                       | $0.6943^{+0.0099}_{-0.011}$     | $z_{\mathrm{eq}}$                     | $3364^{+41}_{-40}$                | $\chi_{6\mathrm{DF}}^2$     | $0.021 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.011}_{-0.0099}$      | $k_{\mathrm{eq}}$                     | $0.01027^{+0.00012}_{-0.00012}$   | $\chi_{\mathrm{MGS}}^2$     | $1.65 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1414^{+0.0017}_{-0.0017}$    | $100\theta_{\mathrm{eq}}$             | $0.8205^{+0.0074}_{-0.0077}$      | $\chi_{\mathrm{DR12BAO}}^2$ | $3.91 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.09617^{+0.00060}_{-0.00061}$ | $100\theta_{\mathrm{s,eq}}$           | $0.4531^{+0.0038}_{-0.0039}$      | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.011}$       | $H(0.15)$                             | $73.23^{+0.66}_{-0.69}$           | $\chi_{\mathrm{CMB}}^2$     | $11944.5 (\nu: 17.6)$        |
| $S_8$                                    | $0.815^{+0.020}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$                | $637.8^{+6.8}_{-6.4}$             | $\chi_{\mathrm{BAO}}^2$     | $5.58 (\nu: 0.1)$            |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.447^{+0.011}_{-0.0099}$      | $H(0.38)$                             | $83.24^{+0.50}_{-0.51}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11968.71; R - 1 = 0.02252$$



### 2.63 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02232^{+0.00029}_{-0.00030}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.452^{+0.013}_{-0.013}$       | $D_{\text{M}}(0.15)$        | $642.1^{+8.6}_{-8.3}$        |
| $\Omega_{\text{c}}h^2$               | $0.1194^{+0.0022}_{-0.0022}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.605^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.93^{+0.62}_{-0.63}$      |
| $100\theta_{\text{MC}}$              | $1.04090^{+0.00060}_{-0.00061}$ | $\sigma_8/h^{0.5}$                 | $0.985^{+0.017}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1531^{+17}_{-17}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $r_{\text{drag}}h$                 | $99.5^{+1.7}_{-1.7}$            | $H(0.51)$                   | $89.66^{+0.50}_{-0.50}$      |
| $\ln(10^{10}A_{\text{s}})$           | $3.043^{+0.026}_{-0.024}$       | $\langle d^2 \rangle^{1/2}$        | $2.436^{+0.042}_{-0.040}$       | $D_{\text{M}}(0.51)$        | $1983^{+20}_{-20}$           |
| $n_{\text{s}}$                       | $0.9663^{+0.0080}_{-0.0078}$    | $z_{\text{re}}$                    | $< 8.93$                        | $H(0.61)$                   | $95.28^{+0.41}_{-0.41}$      |
| $y_{\text{cal}}$                     | $1.0006^{+0.0050}_{-0.0049}$    | $10^9 A_{\text{s}}$                | $2.097^{+0.056}_{-0.051}$       | $D_{\text{M}}(0.61)$        | $2308^{+22}_{-21}$           |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.878^{+0.021}_{-0.020}$       | $H(2.33)$                   | $236.1^{+1.3}_{-1.3}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                           | $1226^{+23}_{-23}$              | $D_{\text{M}}(2.33)$        | $5765^{+20}_{-19}$           |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                          | $5722^{+77}_{-78}$              | $f\sigma_8(0.15)$           | $0.457^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                          | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.010}_{-0.0092}$   |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{1420}$                         | $816.0^{+9.7}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.4749^{+0.0099}_{-0.0097}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $D_{2000}$                         | $230.4^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.6627^{+0.0088}_{-0.0082}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$               | $0.9663^{+0.0080}_{-0.0078}$    | $f\sigma_8(0.51)$           | $0.4734^{+0.0088}_{-0.0085}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                     | $0.24537^{+0.00011}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6202^{+0.0083}_{-0.0077}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24670^{+0.00011}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4684^{+0.0080}_{-0.0077}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D}/\text{H}$           | $2.596^{+0.057}_{-0.053}$       | $\sigma_8(0.61)$            | $0.5901^{+0.0079}_{-0.0073}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.33}_{-0.33}$          | $\text{Age}/\text{Gyr}$            | $13.801^{+0.044}_{-0.042}$      | $f\sigma_8(2.33)$           | $0.2975^{+0.0041}_{-0.0038}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $z_*$                              | $1089.94^{+0.50}_{-0.48}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0044}_{-0.0040}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                              | $144.63^{+0.52}_{-0.51}$        | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                      | $1.04109^{+0.00059}_{-0.00060}$ | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.892^{+0.049}_{-0.048}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9966^{+0.0097}_{-0.0097}$    | $z_{\text{drag}}$                  | $1059.76^{+0.63}_{-0.63}$       | $\chi_{\text{lensing}}^2$   | $9.25 (\nu: 0.2)$            |
| $c_{EE}$                             | $0.9921^{+0.0096}_{-0.0096}$    | $r_{\text{drag}}$                  | $147.31^{+0.53}_{-0.53}$        | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.5)$           |
| $H_0$                                | $67.52^{+0.98}_{-1.0}$          | $k_{\text{D}}$                     | $0.14059^{+0.00064}_{-0.00064}$ | $\chi_{\text{lowl}}^2$      | $23.12 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                   | $0.688^{+0.013}_{-0.014}$       | $100\theta_{\text{D}}$             | $0.16085^{+0.00038}_{-0.00036}$ | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 15.4)$        |
| $\Omega_{\text{m}}$                  | $0.312^{+0.014}_{-0.013}$       | $z_{\text{eq}}$                    | $3386^{+50}_{-49}$              | $\chi_{\text{JLA}}^2$       | $1035.20 (\nu: 0.1)$         |
| $\Omega_{\text{m}}h^2$               | $0.1424^{+0.0021}_{-0.0021}$    | $k_{\text{eq}}$                    | $0.01034^{+0.00015}_{-0.00015}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.1)$             |
| $\Omega_{\text{m}}h^3$               | $0.09611^{+0.00061}_{-0.00063}$ | $100\theta_{\text{eq}}$            | $0.8160^{+0.0094}_{-0.0095}$    | $\chi_{\text{CMB}}^2$       | $11943.5 (\nu: 16.5)$        |
| $\sigma_8$                           | $0.809^{+0.012}_{-0.010}$       | $100\theta_{\text{s,eq}}$          | $0.4508^{+0.0048}_{-0.0049}$    |                             |                              |
| $S_8$                                | $0.826^{+0.024}_{-0.023}$       | $H(0.15)$                          | $72.81^{+0.85}_{-0.85}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12986.49; R - 1 = 0.01335$$



## 2.64 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_JLA\_Riess18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02241^{+0.00028}_{-0.00027}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.601^{+0.011}_{-0.010}$       | $D_M(0.38)$                 | $1522^{+13}_{-13}$           |
| $\Omega_c h^2$              | $0.1183^{+0.0018}_{-0.0017}$    | $\sigma_8/h^{0.5}$          | $0.980^{+0.015}_{-0.015}$       | $H(0.51)$                   | $89.91^{+0.41}_{-0.41}$      |
| $100\theta_{MC}$            | $1.04107^{+0.00057}_{-0.00060}$ | $r_{drag}h$                 | $100.3^{+1.4}_{-1.3}$           | $D_M(0.51)$                 | $1973^{+16}_{-15}$           |
| $\tau$                      | $0.058^{+0.015}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$ | $2.424^{+0.037}_{-0.036}$       | $H(0.61)$                   | $95.48^{+0.35}_{-0.35}$      |
| $\ln(10^{10} A_s)$          | $3.047^{+0.028}_{-0.025}$       | $z_{re}$                    | $8.0^{+1.3}_{-1.3}$             | $D_M(0.61)$                 | $2297^{+17}_{-16}$           |
| $n_s$                       | $0.9691^{+0.0071}_{-0.0078}$    | $10^9 A_s$                  | $2.106^{+0.058}_{-0.054}$       | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{cal}$                   | $1.0009^{+0.0047}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.020}_{-0.019}$       | $D_M(2.33)$                 | $5756^{+17}_{-17}$           |
| $A_{100}^{PS}$              | $237^{+50}_{-50}$               | $D_{40}$                    | $1222^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.452^{+0.010}_{-0.0097}$   |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5732^{+74}_{-74}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0095}$   |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{810}$                   | $2537^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4712^{+0.0086}_{-0.0084}$ |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{1420}$                  | $817.5^{+8.8}_{-8.9}$           | $\sigma_8(0.38)$            | $0.6630^{+0.0098}_{-0.0085}$ |
| $A_{143}^{tSZ}$             | $< 7.84$                        | $D_{2000}$                  | $231.0^{+3.0}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.4705^{+0.0078}_{-0.0075}$ |
| $r_{143 \times 217}^{PS}$   | $0.67^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9691^{+0.0071}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.6207^{+0.0092}_{-0.0080}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24541^{+0.00010}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4661^{+0.0073}_{-0.0069}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24673^{+0.00010}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5908^{+0.0085}_{-0.0079}$ |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.579^{+0.052}_{-0.051}$       | $f\sigma_8(2.33)$           | $0.2981^{+0.0043}_{-0.0040}$ |
| $A_{100}^{dust}$            | $1.01^{+0.36}_{-0.38}$          | Age/Gyr                     | $13.782^{+0.039}_{-0.038}$      | $\sigma_8(2.33)$            | $0.3076^{+0.0046}_{-0.0043}$ |
| $A_{143}^{dust}$            | $0.95^{+0.32}_{-0.33}$          | $z_*$                       | $1089.73^{+0.42}_{-0.42}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.84^{+0.45}_{-0.44}$        | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04125^{+0.00055}_{-0.00061}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                   | $0.9976^{+0.0020}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.044}_{-0.042}$      | $\chi_{lensing}^2$          | $9.41 (\nu: 0.3)$            |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | $1059.90^{+0.64}_{-0.61}$       | $\chi_{simall}^2$           | $397.5 (\nu: 2.3)$           |
| $c_{TE}$                    | $0.996^{+0.010}_{-0.010}$       | $r_{drag}$                  | $147.50^{+0.48}_{-0.48}$        | $\chi_{lowl}^2$             | $22.69 (\nu: 0.3)$           |
| $c_{EE}$                    | $0.9922^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.14047^{+0.00063}_{-0.00060}$ | $\chi_{CamSpec}^2$          | $11515.3 (\nu: 17.9)$        |
| $H_0$                       | $68.03^{+0.75}_{-0.79}$         | $100\theta_D$               | $0.16079^{+0.00035}_{-0.00038}$ | $\chi_{H073p45}^2$          | $10.7 (\nu: 1.2)$            |
| $\Omega_\Lambda$            | $0.694^{+0.010}_{-0.010}$       | $z_{eq}$                    | $3363^{+40}_{-40}$              | $\chi_{JLA}^2$              | $706.63 (\nu: 0.0)$          |
| $\Omega_m$                  | $0.306^{+0.010}_{-0.010}$       | $k_{eq}$                    | $0.01026^{+0.00012}_{-0.00012}$ | $\chi_{6DF}^2$              | $0.020 (\nu: 0.0)$           |
| $\Omega_m h^2$              | $0.1414^{+0.0017}_{-0.0017}$    | $100\theta_{eq}$            | $0.8206^{+0.0075}_{-0.0075}$    | $\chi_{MGS}^2$              | $1.66 (\nu: 0.1)$            |
| $\Omega_m h^3$              | $0.09617^{+0.00064}_{-0.00062}$ | $100\theta_{s,eq}$          | $0.4532^{+0.0038}_{-0.0039}$    | $\chi_{DR12BAO}^2$          | $3.89 (\nu: 0.2)$            |
| $\sigma_8$                  | $0.808^{+0.012}_{-0.010}$       | $H(0.15)$                   | $73.25^{+0.67}_{-0.68}$         | $\chi_{prior}^2$            | $7.7 (\nu: 5.7)$             |
| $S_8$                       | $0.815^{+0.020}_{-0.019}$       | $D_M(0.15)$                 | $637.7^{+6.7}_{-6.4}$           | $\chi_{CMB}^2$              | $11944.9 (\nu: 19.6)$        |
| $\sigma_8 \Omega_m^{0.5}$   | $0.447^{+0.011}_{-0.010}$       | $H(0.38)$                   | $83.25^{+0.49}_{-0.50}$         | $\chi_{BAO}^2$              | $5.57 (\nu: 0.1)$            |

$$\bar{\chi}_{\text{eff}}^2 = 12675.50; R - 1 = 0.05354$$



## 2.65 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02235^{+0.00027}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.011}_{-0.011}$       | $D_M(0.38)$                 | $1528^{+14}_{-13}$           |
| $\Omega_c h^2$              | $0.1189^{+0.0018}_{-0.0017}$    | $\sigma_8/h^{0.5}$          | $0.982^{+0.016}_{-0.015}$       | $H(0.51)$                   | $89.75^{+0.41}_{-0.42}$      |
| $100\theta_{MC}$            | $1.04096^{+0.00057}_{-0.00060}$ | $r_{drag}h$                 | $99.8^{+1.3}_{-1.4}$            | $D_M(0.51)$                 | $1979^{+16}_{-16}$           |
| $\tau$                      | $0.056^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$ | $2.430^{+0.039}_{-0.037}$       | $H(0.61)$                   | $95.36^{+0.35}_{-0.36}$      |
| $\ln(10^{10} A_s)$          | $3.044^{+0.027}_{-0.025}$       | $z_{re}$                    | $7.8^{+1.2}_{-1.3}$             | $D_M(0.61)$                 | $2303^{+18}_{-17}$           |
| $n_s$                       | $0.9674^{+0.0076}_{-0.0074}$    | $10^9 A_s$                  | $2.100^{+0.057}_{-0.052}$       | $H(2.33)$                   | $235.8^{+1.1}_{-1.1}$        |
| $y_{cal}$                   | $1.0007^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | $5762^{+18}_{-16}$           |
| $A_{100}^{PS}$              | $239^{+50}_{-50}$               | $D_{40}$                    | $1225^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.455^{+0.010}_{-0.010}$    |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $D_{220}$                   | $5726^{+75}_{-78}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0094}$   |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{810}$                   | $2536^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4733^{+0.0088}_{-0.0085}$ |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{1420}$                  | $816.4^{+9.5}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6627^{+0.0091}_{-0.0085}$ |
| $A_{143}^{tSZ}$             | $< 7.58$                        | $D_{2000}$                  | $230.6^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4721^{+0.0080}_{-0.0078}$ |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9674^{+0.0076}_{-0.0074}$    | $\sigma_8(0.51)$            | $0.6203^{+0.0085}_{-0.0079}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P$                       | $0.24538^{+0.00010}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4673^{+0.0074}_{-0.0073}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P^{BBN}$                 | $0.24671^{+0.00010}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5902^{+0.0081}_{-0.0076}$ |
| $A^{kSZ}$                   | —                               | $10^5 D/H$                  | $2.590^{+0.054}_{-0.050}$       | $f\sigma_8(2.33)$           | $0.2977^{+0.0041}_{-0.0039}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | $13.794^{+0.040}_{-0.037}$      | $\sigma_8(2.33)$            | $0.3070^{+0.0044}_{-0.0041}$ |
| $A_{143}^{dust}$            | $0.96^{+0.33}_{-0.33}$          | $z_*$                       | $1089.86^{+0.44}_{-0.41}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{dust}$            | $0.97^{+0.22}_{-0.20}$          | $r_*$                       | $144.73^{+0.44}_{-0.44}$        | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04115^{+0.00056}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.901^{+0.043}_{-0.042}$      | $\chi^2_{lensing}$          | $9.27 (\nu: 0.2)$            |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | $1059.80^{+0.59}_{-0.63}$       | $\chi^2_{simall}$           | $397.1 (\nu: 1.8)$           |
| $c_{TE}$                    | $0.9966^{+0.0096}_{-0.0098}$    | $r_{drag}$                  | $147.40^{+0.48}_{-0.47}$        | $\chi^2_{lowl}$             | $22.94 (\nu: 0.3)$           |
| $c_{EE}$                    | $0.9923^{+0.0097}_{-0.0095}$    | $k_D$                       | $0.14052^{+0.00061}_{-0.00061}$ | $\chi^2_{CamSpec}$          | $11514.3 (\nu: 15.4)$        |
| $H_0$                       | $67.73^{+0.78}_{-0.81}$         | $100\theta_D$               | $0.16083^{+0.00037}_{-0.00035}$ | $\chi^2_{JLA}$              | $1035.02 (\nu: 0.0)$         |
| $\Omega_\Lambda$            | $0.691^{+0.010}_{-0.011}$       | $z_{eq}$                    | $3376^{+41}_{-40}$              | $\chi^2_{6DF}$              | $0.038 (\nu: 0.0)$           |
| $\Omega_m$                  | $0.309^{+0.011}_{-0.010}$       | $k_{eq}$                    | $0.01030^{+0.00012}_{-0.00012}$ | $\chi^2_{MGS}$              | $1.37 (\nu: 0.1)$            |
| $\Omega_m h^2$              | $0.1419^{+0.0017}_{-0.0017}$    | $100\theta_{eq}$            | $0.8180^{+0.0076}_{-0.0076}$    | $\chi^2_{DR12BAO}$          | $4.5 (\nu: 0.6)$             |
| $\Omega_m h^3$              | $0.09612^{+0.00061}_{-0.00063}$ | $100\theta_{s,eq}$          | $0.4518^{+0.0039}_{-0.0039}$    | $\chi^2_{prior}$            | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                  | $0.809^{+0.012}_{-0.010}$       | $H(0.15)$                   | $72.98^{+0.68}_{-0.69}$         | $\chi^2_{CMB}$              | $11943.6 (\nu: 16.4)$        |
| $S_8$                       | $0.821^{+0.020}_{-0.020}$       | $D_M(0.15)$                 | $640.3^{+6.9}_{-6.6}$           | $\chi^2_{BAO}$              | $5.86 (\nu: 0.4)$            |
| $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.06^{+0.51}_{-0.52}$         |                             |                              |

$$\bar{\chi}^2_{\text{eff}} = 12992.25; R - 1 = 0.01504$$



## 2.66 base\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_Pantheon18\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                        | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|-----------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02241^{+0.00026}_{-0.00027}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.011}_{-0.0099}$        | $D_{\mathrm{M}}(0.38)$      | $1522^{+13}_{-13}$           |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1183^{+0.0017}_{-0.0016}$    | $\sigma_8/h^{0.5}$                   | $0.979^{+0.016}_{-0.015}$         | $H(0.51)$                   | $89.91^{+0.40}_{-0.41}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04107^{+0.00057}_{-0.00060}$ | $r_{\mathrm{drag}}h$                 | $100.4^{+1.3}_{-1.3}$             | $D_{\mathrm{M}}(0.51)$      | $1973^{+16}_{-15}$           |
| $\tau$                                   | $0.058^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$          | $2.423^{+0.038}_{-0.035}$         | $H(0.61)$                   | $95.49^{+0.34}_{-0.35}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.047^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                    | $8.0^{+1.3}_{-1.4}$               | $D_{\mathrm{M}}(0.61)$      | $2296^{+17}_{-16}$           |
| $n_{\mathrm{s}}$                         | $0.9690^{+0.0073}_{-0.0074}$    | $10^9 A_{\mathrm{s}}$                | $2.106^{+0.059}_{-0.055}$         | $H(2.33)$                   | $235.5^{+1.1}_{-1.1}$        |
| $y_{\mathrm{cal}}$                       | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.875^{+0.020}_{-0.019}$         | $D_{\mathrm{M}}(2.33)$      | $5756^{+17}_{-16}$           |
| $A_{100}^{\mathrm{PS}}$                  | $237^{+50}_{-50}$               | $D_{40}$                             | $1223^{+23}_{-22}$                | $f\sigma_8(0.15)$           | $0.451^{+0.010}_{-0.0093}$   |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                            | $5733^{+74}_{-75}$                | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0095}$   |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{810}$                            | $2537^{+26}_{-26}$                | $f\sigma_8(0.38)$           | $0.4710^{+0.0088}_{-0.0080}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                           | $817.4^{+9.0}_{-9.3}$             | $\sigma_8(0.38)$            | $0.6628^{+0.0098}_{-0.0084}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.70$                        | $D_{2000}$                           | $230.9^{+3.0}_{-3.2}$             | $f\sigma_8(0.51)$           | $0.4704^{+0.0080}_{-0.0074}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.67^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9690^{+0.0073}_{-0.0074}$      | $\sigma_8(0.51)$            | $0.6206^{+0.0089}_{-0.0083}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.245409^{+0.000097}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4659^{+0.0076}_{-0.0069}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.246736^{+0.000098}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.5907^{+0.0085}_{-0.0079}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.578^{+0.051}_{-0.047}$         | $f\sigma_8(2.33)$           | $0.2981^{+0.0043}_{-0.0041}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.36}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.782^{+0.039}_{-0.037}$        | $\sigma_8(2.33)$            | $0.3076^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.33}_{-0.33}$          | $z_*$                                | $1089.72^{+0.42}_{-0.39}$         | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.21}_{-0.20}$          | $r_*$                                | $144.84^{+0.43}_{-0.43}$          | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.7}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04125^{+0.00058}_{-0.00060}$   | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.911^{+0.042}_{-0.042}$        | $\chi_{\mathrm{lensing}}^2$ | $9.42 (\nu: 0.4)$            |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.91^{+0.60}_{-0.62}$         | $\chi_{\mathrm{simall}}^2$  | $397.5 (\nu: 2.3)$           |
| $c_{TE}$                                 | $0.9965^{+0.010}_{-0.0099}$     | $r_{\mathrm{drag}}$                  | $147.50^{+0.46}_{-0.47}$          | $\chi_{\mathrm{lowl}}^2$    | $22.71 (\nu: 0.3)$           |
| $c_{EE}$                                 | $0.9923^{+0.0095}_{-0.0095}$    | $k_{\mathrm{D}}$                     | $0.14047^{+0.00060}_{-0.00057}$   | $\chi_{\mathrm{CamSpec}}^2$ | $11515.0 (\nu: 16.0)$        |
| $H_0$                                    | $68.04^{+0.74}_{-0.77}$         | $100\theta_{\mathrm{D}}$             | $0.16078^{+0.00036}_{-0.00035}$   | $\chi_{\mathrm{H073p45}}^2$ | $10.7 (\nu: 1.1)$            |
| $\Omega_{\Lambda}$                       | $0.6946^{+0.0097}_{-0.010}$     | $z_{\mathrm{eq}}$                    | $3362^{+40}_{-39}$                | $\chi_{\mathrm{JLA}}^2$     | $1034.87 (\nu: 0.0)$         |
| $\Omega_{\mathrm{m}}$                    | $0.305^{+0.010}_{-0.0097}$      | $k_{\mathrm{eq}}$                    | $0.01026^{+0.00012}_{-0.00012}$   | $\chi_{6\mathrm{DF}}^2$     | $0.019 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1413^{+0.0017}_{-0.0016}$    | $100\theta_{\mathrm{eq}}$            | $0.8207^{+0.0072}_{-0.0074}$      | $\chi_{\mathrm{MGS}}^2$     | $1.67 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}h^3$                 | $0.09617^{+0.00059}_{-0.00061}$ | $100\theta_{\mathrm{s,eq}}$          | $0.4532^{+0.0037}_{-0.0038}$      | $\chi_{\mathrm{DR12BAO}}^2$ | $3.86 (\nu: 0.2)$            |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.011}$       | $H(0.15)$                            | $73.26^{+0.64}_{-0.67}$           | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $S_8$                                    | $0.815^{+0.020}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$               | $637.6^{+6.6}_{-6.2}$             | $\chi_{\mathrm{CMB}}^2$     | $11944.6 (\nu: 17.7)$        |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.446^{+0.011}_{-0.0096}$      | $H(0.38)$                            | $83.26^{+0.48}_{-0.50}$           | $\chi_{\mathrm{BAO}}^2$     | $5.55 (\nu: 0.1)$            |

$$\bar{\chi}_{\mathrm{eff}}^2 = 13003.54; R - 1 = 0.02380$$



## 2.67 base\_CamSpecHM\_TT

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|
| $\Omega_b h^2$                       | 0.02257  | $0.02248^{+0.00057}_{-0.00057}$ | $S_8$                       | 0.875    | $0.871^{+0.051}_{-0.051}$       | $k_{\text{eq}}$             | 0.010181 | $0.01023^{+0.00037}_{-0.00036}$ |
| $\Omega_c h^2$                       | 0.1170   | $0.1178^{+0.0055}_{-0.0052}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4793   | $0.477^{+0.028}_{-0.028}$       | $100\theta_{\text{eq}}$     | 0.8263   | $0.823^{+0.023}_{-0.024}$       |
| $100\theta_{\text{MC}}$              | 1.04136  | $1.0413^{+0.0011}_{-0.0011}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6493   | $0.644^{+0.032}_{-0.034}$       | $100\theta_{\text{s,eq}}$   | 0.4560   | $0.454^{+0.012}_{-0.012}$       |
| $\tau$                               | 0.149    | $0.134^{+0.068}_{-0.077}$       | $\sigma_8/h^{0.5}$          | 1.061    | $1.051^{+0.053}_{-0.057}$       | $H(0.15)$                   | 73.86    | $73.5^{+2.2}_{-2.2}$            |
| $\ln(10^{10} A_s)$                   | 3.224    | $3.20^{+0.13}_{-0.15}$          | $r_{\text{drag}} h$         | 101.48   | $100.9^{+4.4}_{-4.4}$           | $D_M(0.15)$                 | 631.8    | $635^{+22}_{-21}$               |
| $n_s$                                | 0.9767   | $0.973^{+0.017}_{-0.017}$       | $\langle d^2 \rangle^{1/2}$ | 2.615    | $2.60^{+0.12}_{-0.14}$          | $H(0.38)$                   | 83.71    | $83.5^{+1.6}_{-1.6}$            |
| $A_{100}^{\text{PS}}$                | 218      | $232^{+50}_{-50}$               | $z_{\text{re}}$             | 15.5     | $14.3^{+5.1}_{-5.6}$            | $D_M(0.38)$                 | 1510.3   | $1517^{+43}_{-42}$              |
| $A_{143}^{\text{PS}}$                | 45.5     | $35^{+20}_{-20}$                | $10^9 A_s$                  | 2.512    | $2.45^{+0.33}_{-0.34}$          | $H(0.51)$                   | 90.29    | $90.1^{+1.3}_{-1.2}$            |
| $A_{217}^{\text{PS}}$                | 108.9    | $104^{+20}_{-30}$               | $10^9 A_s e^{-2\tau}$       | 1.8666   | $1.869^{+0.033}_{-0.032}$       | $D_M(0.51)$                 | 1959     | $1966^{+51}_{-49}$              |
| $A_{217}^{\text{CIB}}$               | 37.5     | $37^{+10}_{-10}$                | $D_{40}$                    | 1251.9   | $1253^{+37}_{-34}$              | $H(0.61)$                   | 95.79    | $95.6^{+1.1}_{-1.0}$            |
| $A_{143}^{\text{tSZ}}$               | 6.29     | $< 7.57$                        | $D_{220}$                   | 5717     | $5717^{+81}_{-81}$              | $D_M(0.61)$                 | 2281     | $2289^{+55}_{-54}$              |
| $r_{143 \times 217}^{\text{PS}}$     | 0.787    | $0.68^{+0.26}_{-0.27}$          | $D_{810}$                   | 2527.8   | $2527^{+28}_{-28}$              | $H(2.33)$                   | 234.84   | $235.2^{+3.2}_{-3.0}$           |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.78     | —                               | $D_{1420}$                  | 816.1    | $814^{+10}_{-10}$               | $D_M(2.33)$                 | 5742.0   | $5749^{+45}_{-46}$              |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.99     | —                               | $D_{2000}$                  | 232.89   | $231.9^{+4.4}_{-4.3}$           | $f\sigma_8(0.15)$           | 0.4855   | $0.483^{+0.027}_{-0.027}$       |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $n_{\text{s},0.002}$        | 0.9767   | $0.973^{+0.017}_{-0.017}$       | $\sigma_8(0.15)$            | 0.8144   | $0.804^{+0.046}_{-0.051}$       |
| $A_{100}^{\text{dust}}$              | 0.992    | $0.998^{+0.39}_{-0.38}$         | $Y_{\text{P}}$              | 0.245470 | $0.24543^{+0.00024}_{-0.00024}$ | $f\sigma_8(0.38)$           | 0.5089   | $0.505^{+0.026}_{-0.027}$       |
| $A_{143}^{\text{dust}}$              | 0.958    | $0.95^{+0.35}_{-0.34}$          | $Y_{\text{P}}^{\text{BBN}}$ | 0.246797 | $0.24676^{+0.00024}_{-0.00024}$ | $\sigma_8(0.38)$            | 0.7236   | $0.714^{+0.043}_{-0.048}$       |
| $A_{217}^{\text{dust}}$              | 0.992    | $0.98^{+0.21}_{-0.20}$          | $10^5 \text{D}/\text{H}$    | 2.549    | $2.57^{+0.11}_{-0.10}$          | $f\sigma_8(0.51)$           | 0.5093   | $0.505^{+0.025}_{-0.027}$       |
| $A_{143 \times 217}^{\text{dust}}$   | 1.017    | $1.02^{+0.31}_{-0.31}$          | Age/Gyr                     | 13.751   | $13.77^{+0.10}_{-0.10}$         | $\sigma_8(0.51)$            | 0.6779   | $0.669^{+0.042}_{-0.046}$       |
| $y_{\text{cal}}$                     | 1.00009  | $1.0002^{+0.0050}_{-0.0049}$    | $z_*$                       | 1089.41  | $1089.6^{+1.1}_{-1.1}$          | $f\sigma_8(0.61)$           | 0.5052   | $0.500^{+0.025}_{-0.028}$       |
| $c_{100}$                            | 0.99785  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                       | 145.05   | $144.9^{+1.1}_{-1.2}$           | $\sigma_8(0.61)$            | 0.6455   | $0.637^{+0.040}_{-0.044}$       |
| $c_{217}$                            | 1.00088  | $1.0009^{+0.0031}_{-0.0031}$    | $100\theta_*$               | 1.04153  | $1.0414^{+0.0010}_{-0.0011}$    | $f\sigma_8(2.33)$           | 0.3261   | $0.322^{+0.021}_{-0.023}$       |
| $H_0$                                | 68.73    | $68.4^{+2.5}_{-2.5}$            | $D_M(z_*)/\text{Gpc}$       | 13.927   | $13.92^{+0.10}_{-0.10}$         | $\sigma_8(2.33)$            | 0.3370   | $0.332^{+0.023}_{-0.025}$       |
| $\Omega_\Lambda$                     | 0.7031   | $0.698^{+0.031}_{-0.035}$       | $z_{\text{drag}}$           | 1060.20  | $1060.0^{+1.1}_{-1.0}$          | $f_{2000}^{143}$            | 25.9     | $27^{+7}_{-7}$                  |
| $\Omega_{\text{m}}$                  | 0.2969   | $0.302^{+0.035}_{-0.031}$       | $r_{\text{drag}}$           | 147.66   | $147.6^{+1.1}_{-1.1}$           | $f_{2000}^{217}$            | 103.71   | $104.9^{+4.9}_{-4.9}$           |
| $\Omega_{\text{m}} h^2$              | 0.1402   | $0.1409^{+0.0051}_{-0.0049}$    | $k_{\text{D}}$              | 0.14042  | $0.1404^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | 29.0     | $30^{+5}_{-5}$                  |
| $\Omega_{\text{m}} h^3$              | 0.09638  | $0.09628^{+0.00097}_{-0.00095}$ | $100\theta_{\text{D}}$      | 0.16065  | $0.16074^{+0.00059}_{-0.00057}$ | $\chi_{\text{CamSpec}}^2$   | 7045.3   | $7059.6 (\nu: 14.0)$            |
| $\sigma_8$                           | 0.880    | $0.869^{+0.048}_{-0.053}$       | $z_{\text{eq}}$             | 3336     | $3351^{+120}_{-120}$            | $\chi_{\text{prior}}^2$     | 1.4      | $7.3 (\nu: 5.7)$                |

Best-fit  $\chi_{\text{eff}}^2 = 7046.70$ ;  $\bar{\chi}_{\text{eff}}^2 = 7066.87$ ;  $R - 1 = 0.00646$   
 $\chi_{\text{eff}}^2$ : CMB - CamSpec like\_10.7HM: 7045.25



## 2.68 base\_CamSpecHM\_TT\_lowl

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.02253  | $0.02242^{+0.00054}_{-0.00054}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4693   | $0.468^{+0.027}_{-0.027}$       | $100\theta_{s,eq}$          | 0.4563   | $0.455^{+0.011}_{-0.011}$ |
| $\Omega_c h^2$              | 0.1169   | $0.1177^{+0.0052}_{-0.0050}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6359   | $0.631^{+0.030}_{-0.032}$       | $H(0.15)$                   | 73.84    | $73.5^{+2.1}_{-2.0}$      |
| $100\theta_{MC}$            | 1.04132  | $1.0412^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$          | 1.039    | $1.030^{+0.049}_{-0.052}$       | $D_M(0.15)$                 | 631.9    | $635^{+20}_{-19}$         |
| $\tau$                      | 0.128    | $0.113^{+0.063}_{-0.069}$       | $r_{drag}h$                 | 101.52   | $100.9^{+4.1}_{-4.1}$           | $H(0.38)$                   | 83.69    | $83.4^{+1.5}_{-1.5}$      |
| $\ln(10^{10}A_s)$           | 3.183    | $3.15^{+0.12}_{-0.13}$          | $\langle d^2 \rangle^{1/2}$ | 2.560    | $2.54^{+0.11}_{-0.12}$          | $D_M(0.38)$                 | 1510.7   | $1518^{+40}_{-39}$        |
| $n_s$                       | 0.9775   | $0.973^{+0.016}_{-0.016}$       | $z_{re}$                    | 14.0     | $12.7^{+4.9}_{-5.4}$            | $H(0.51)$                   | 90.26    | $90.1^{+1.2}_{-1.2}$      |
| $y_{cal}$                   | 1.00018  | $1.0003^{+0.0048}_{-0.0048}$    | $10^9 A_s$                  | 2.411    | $2.35^{+0.29}_{-0.29}$          | $D_M(0.51)$                 | 1959.3   | $1967^{+47}_{-46}$        |
| $A_{100}^{PS}$              | 219      | $233^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8656   | $1.868^{+0.030}_{-0.030}$       | $H(0.61)$                   | 95.76    | $95.60^{+0.99}_{-0.92}$   |
| $A_{143}^{PS}$              | 45.0     | $36^{+20}_{-20}$                | $D_{40}$                    | 1234.6   | $1237^{+32}_{-31}$              | $D_M(0.61)$                 | 2282     | $2291^{+51}_{-50}$        |
| $A_{217}^{PS}$              | 109.7    | $104^{+30}_{-30}$               | $D_{220}$                   | 5706     | $5708^{+80}_{-81}$              | $H(2.33)$                   | 234.71   | $235.1^{+3.0}_{-2.9}$     |
| $A_{217}^{CIB}$             | 37.6     | $38^{+10}_{-10}$                | $D_{810}$                   | 2529.3   | $2528^{+27}_{-27}$              | $D_M(2.33)$                 | 5744.2   | $5752^{+41}_{-43}$        |
| $A_{143}^{tSZ}$             | 6.20     | $< 7.57$                        | $D_{1420}$                  | 817.0    | $815^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4754   | $0.473^{+0.026}_{-0.026}$ |
| $r_{143 \times 217}^{PS}$   | 0.807    | $0.67^{+0.26}_{-0.27}$          | $D_{2000}$                  | 232.68   | $231.6^{+4.2}_{-4.3}$           | $\sigma_8(0.15)$            | 0.7978   | $0.788^{+0.042}_{-0.045}$ |
| $r_{143 \times 217}^{CIB}$  | 0.70     | —                               | $n_{s,0.002}$               | 0.9775   | $0.973^{+0.016}_{-0.016}$       | $f\sigma_8(0.38)$           | 0.4984   | $0.495^{+0.024}_{-0.025}$ |
| $\xi^{tSZ \times CIB}$      | 0.96     | —                               | $Y_P$                       | 0.245453 | $0.24541^{+0.00022}_{-0.00023}$ | $\sigma_8(0.38)$            | 0.7089   | $0.700^{+0.039}_{-0.042}$ |
| $A^{kSZ}$                   | 0.1      | —                               | $Y_P^{BBN}$                 | 0.246780 | $0.24674^{+0.00022}_{-0.00023}$ | $f\sigma_8(0.51)$           | 0.4988   | $0.495^{+0.024}_{-0.025}$ |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.38}_{-0.39}$          | $10^5 D/H$                  | 2.557    | $2.58^{+0.10}_{-0.098}$         | $\sigma_8(0.51)$            | 0.6642   | $0.655^{+0.037}_{-0.040}$ |
| $A_{143}^{dust}$            | 0.962    | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | 13.756   | $13.773^{+0.092}_{-0.093}$      | $f\sigma_8(0.61)$           | 0.4948   | $0.490^{+0.024}_{-0.025}$ |
| $A_{217}^{dust}$            | 0.978    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.46  | $1089.7^{+1.0}_{-1.0}$          | $\sigma_8(0.61)$            | 0.6324   | $0.624^{+0.036}_{-0.039}$ |
| $A_{143 \times 217}^{dust}$ | 1.030    | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | 145.12   | $145.0^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | 0.3195   | $0.315^{+0.019}_{-0.020}$ |
| $c_{100}$                   | 0.99783  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04150  | $1.0414^{+0.0010}_{-0.0010}$    | $\sigma_8(2.33)$            | 0.3302   | $0.325^{+0.021}_{-0.022}$ |
| $c_{217}$                   | 1.00070  | $1.0009^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.934   | $13.922^{+0.098}_{-0.10}$       | $f_{2000}^{143}$            | 25.9     | $27^{+7}_{-7}$            |
| $H_0$                       | 68.72    | $68.3^{+2.4}_{-2.4}$            | $z_{drag}$                  | 1060.09  | $1059.9^{+1.0}_{-1.0}$          | $f_{2000}^{217}$            | 103.94   | $105.3^{+4.7}_{-4.7}$     |
| $\Omega_\Lambda$            | 0.7034   | $0.698^{+0.029}_{-0.032}$       | $r_{drag}$                  | 147.74   | $147.6^{+1.0}_{-1.1}$           | $f_{2000}^{143 \times 217}$ | 29.3     | $30^{+5}_{-5}$            |
| $\Omega_m$                  | 0.2966   | $0.302^{+0.032}_{-0.029}$       | $k_D$                       | 0.14030  | $0.1403^{+0.0011}_{-0.0010}$    | $\chi_{lowl}^2$             | 24.50    | $24.8 (\nu: 1.4)$         |
| $\Omega_m h^2$              | 0.14008  | $0.1408^{+0.0048}_{-0.0046}$    | $100\theta_D$               | 0.16071  | $0.16081^{+0.00059}_{-0.00057}$ | $\chi_{CamSpec}^2$          | 7046.4   | $7060.1 (\nu: 15.0)$      |
| $\Omega_m h^3$              | 0.09626  | $0.09616^{+0.00097}_{-0.00092}$ | $z_{eq}$                    | 3332     | $3349^{+110}_{-110}$            | $\chi_{prior}^2$            | 1.4      | $7.4 (\nu: 5.6)$          |
| $\sigma_8$                  | 0.8616   | $0.851^{+0.044}_{-0.048}$       | $k_{eq}$                    | 0.010170 | $0.01022^{+0.00035}_{-0.00034}$ | $\chi_{CMB}^2$              | 7070.9   | $7084.8 (\nu: 14.5)$      |
| $S_8$                       | 0.8568   | $0.854^{+0.050}_{-0.049}$       | $100\theta_{eq}$            | 0.8268   | $0.824^{+0.022}_{-0.022}$       |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7072.29$ ;  $\bar{\chi}_{eff}^2 = 7092.24$ ;  $R - 1 = 0.00797$

$\chi_{eff}^2$ : CMB - commander\_dx12\_v3\_2\_29: 24.50 CamSpec like\_10.7HM: 7046.38



## 2.69 base\_CamSpecHM\_TT\_lowl\_post\_BAO

| Parameter  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                                 | $0.02239^{+0.00043}_{-0.00042}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.631^{+0.030}_{-0.032}$       | $D_{\mathrm{M}}(0.15)$      | $636.9^{+9.9}_{-9.8}$     |
| $\Omega_{\mathrm{c}}h^2$                                 | $0.1181^{+0.0025}_{-0.0025}$    | $\sigma_8/h^{0.5}$                   | $1.030^{+0.049}_{-0.052}$       | $H(0.38)$                   | $83.31^{+0.78}_{-0.76}$   |
| $100\theta_{\mathrm{MC}}$                                | $1.04117^{+0.00088}_{-0.00085}$ | $r_{\mathrm{drag}}h$                 | $100.6^{+2.0}_{-2.0}$           | $D_{\mathrm{M}}(0.38)$      | $1521^{+20}_{-20}$        |
| $\tau$   | $0.109^{+0.052}_{-0.056}$       | $\langle d^2 \rangle^{1/2}$          | $2.54^{+0.11}_{-0.12}$          | $H(0.51)$                   | $89.96^{+0.65}_{-0.63}$   |
| $\ln(10^{10}A_{\mathrm{s}})$                             | $3.15^{+0.10}_{-0.11}$          | $z_{\mathrm{re}}$                    | $12.5^{+4.2}_{-4.5}$            | $D_{\mathrm{M}}(0.51)$      | $1971^{+24}_{-24}$        |
| $n_{\mathrm{s}}$   | $0.9721^{+0.0099}_{-0.0098}$    | $10^9 A_{\mathrm{s}}$                | $2.33^{+0.24}_{-0.25}$          | $H(0.61)$                   | $95.52^{+0.56}_{-0.53}$   |
| $y_{\mathrm{cal}}$                                       | $1.0003^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.870^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2294^{+25}_{-26}$        |
| $A_{100}^{\mathrm{PS}}$                                  | $234^{+50}_{-50}$               | $D_{40}$                             | $1237^{+31}_{-30}$              | $H(2.33)$                   | $235.3^{+1.6}_{-1.6}$     |
| $A_{143}^{\mathrm{PS}}$                                  | $36^{+20}_{-20}$                | $D_{220}$                            | $5707^{+79}_{-78}$              | $D_{\mathrm{M}}(2.33)$      | $5755^{+26}_{-27}$        |
| $A_{217}^{\mathrm{PS}}$                                  | $104^{+20}_{-30}$               | $D_{810}$                            | $2529^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.474^{+0.024}_{-0.024}$ |
| $A_{217}^{\mathrm{CIB}}$                                 | $38^{+20}_{-10}$                | $D_{1420}$                           | $814.9^{+9.7}_{-9.8}$           | $\sigma_8(0.15)$            | $0.786^{+0.040}_{-0.041}$ |
| $A_{143}^{\mathrm{tSZ}}$                                 | $< 7.57$                        | $D_{2000}$                           | $231.4^{+3.8}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.495^{+0.024}_{-0.025}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$                       | $0.67^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$               | $0.9721^{+0.0099}_{-0.0098}$    | $\sigma_8(0.38)$            | $0.698^{+0.036}_{-0.037}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$                      | —                               | $Y_{\mathrm{P}}$                     | $0.24540^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.51)$           | $0.494^{+0.024}_{-0.025}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$                 | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24673^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.653^{+0.033}_{-0.035}$ |
| $A^{\mathrm{kSZ}}$                                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.583^{+0.079}_{-0.077}$       | $f\sigma_8(0.61)$           | $0.490^{+0.024}_{-0.025}$ |
| $A_{100}^{\mathrm{dust}}$                                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.780^{+0.060}_{-0.062}$      | $\sigma_8(0.61)$            | $0.622^{+0.032}_{-0.034}$ |
| $A_{143}^{\mathrm{dust}}$                                | $0.96^{+0.35}_{-0.36}$          | $z_*$                                | $1089.73^{+0.64}_{-0.63}$       | $f\sigma_8(2.33)$           | $0.314^{+0.017}_{-0.017}$ |
| $A_{217}^{\mathrm{dust}}$                                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                | $144.91^{+0.62}_{-0.62}$        | $\sigma_8(2.33)$            | $0.324^{+0.017}_{-0.018}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$                     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04136^{+0.00087}_{-0.00083}$ | $f_{2000}^{143}$            | $28^{+7}_{-6}$            |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.916^{+0.061}_{-0.061}$      | $f_{2000}^{217}$            | $105.5^{+4.5}_{-4.4}$     |
| $c_{217}$  | $1.0010^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.84^{+0.93}_{-0.90}$       | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$            |
| $H_0$  | $68.1^{+1.2}_{-1.2}$            | $r_{\mathrm{drag}}$                  | $147.58^{+0.67}_{-0.69}$        | $\chi_{\mathrm{lowl}}^2$    | $24.7 (\nu: 1.4)$         |
| $\Omega_{\Lambda}$                                       | $0.696^{+0.015}_{-0.015}$       | $k_{\mathrm{D}}$                     | $0.14037^{+0.00090}_{-0.00089}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7059.6 (\nu: 14.6)$      |
| $\Omega_{\mathrm{m}}$                                    | $0.304^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{D}}$             | $0.16083^{+0.00054}_{-0.00053}$ | $\chi_{6\mathrm{DF}}^2$     | $0.044 (\nu: 0.0)$        |
| $\Omega_{\mathrm{m}}h^2$                                 | $0.1411^{+0.0024}_{-0.0024}$    | $z_{\mathrm{eq}}$                    | $3357^{+58}_{-57}$              | $\chi_{\mathrm{MGS}}^2$     | $1.82 (\nu: 0.2)$         |
| $\Omega_{\mathrm{m}}h^3$                                 | $0.09615^{+0.00098}_{-0.00092}$ | $k_{\mathrm{eq}}$                    | $0.01025^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.1 (\nu: 0.6)$          |
| $\sigma_8$   | $0.850^{+0.042}_{-0.044}$       | $100\theta_{\mathrm{eq}}$            | $0.822^{+0.011}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$   | $7.4 (\nu: 5.5)$          |
| $S_8$  | $0.856^{+0.044}_{-0.044}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4538^{+0.0057}_{-0.0056}$    | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.6)$          |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$                      | $0.469^{+0.024}_{-0.024}$       | $H(0.15)$                            | $73.3^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $7084.3 (\nu: 14.0)$      |
| $\bar{\chi}_{\mathrm{eff}}^2 = 7097.63; R - 1 = 0.01179$ |                                 |                                      |                                 |                             |                           |



## 2.70 base\_CamSpecHM\_TT\_lowl\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02243^{+0.00054}_{-0.00052}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.468^{+0.027}_{-0.026}$       | $100\theta_{\mathrm{s,eq}}$ | $0.455^{+0.011}_{-0.011}$ |
| $\Omega_{\mathrm{c}} h^2$                | $0.1176^{+0.0050}_{-0.0049}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.632^{+0.030}_{-0.030}$       | $H(0.15)$                   | $73.5^{+2.0}_{-1.9}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0412^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$                    | $1.031^{+0.048}_{-0.048}$       | $D_{\mathrm{M}}(0.15)$      | $635^{+19}_{-19}$         |
| $\tau$                                   | $0.115^{+0.061}_{-0.060}$       | $r_{\mathrm{drag}} h$                 | $100.9^{+4.1}_{-4.0}$           | $H(0.38)$                   | $83.5^{+1.5}_{-1.4}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.16^{+0.11}_{-0.11}$          | $\langle d^2 \rangle^{1/2}$           | $2.54^{+0.11}_{-0.11}$          | $D_{\mathrm{M}}(0.38)$      | $1517^{+39}_{-39}$        |
| $n_{\mathrm{s}}$                         | $0.974^{+0.016}_{-0.015}$       | $z_{\mathrm{re}}$                     | $12.9^{+4.4}_{-5.1}$            | $H(0.51)$                   | $90.1^{+1.2}_{-1.1}$      |
| $y_{\mathrm{cal}}$                       | $1.0003^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$                 | $2.36^{+0.27}_{-0.26}$          | $D_{\mathrm{M}}(0.51)$      | $1967^{+45}_{-46}$        |
| $A_{100}^{\mathrm{PS}}$                  | $232^{+50}_{-50}$               | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.868^{+0.030}_{-0.029}$       | $H(0.61)$                   | $95.61^{+0.98}_{-0.90}$   |
| $A_{143}^{\mathrm{PS}}$                  | $35^{+20}_{-20}$                | $D_{40}$                              | $1237^{+32}_{-31}$              | $D_{\mathrm{M}}(0.61)$      | $2290^{+49}_{-50}$        |
| $A_{217}^{\mathrm{PS}}$                  | $104^{+30}_{-30}$               | $D_{220}$                             | $5708^{+80}_{-80}$              | $H(2.33)$                   | $235.1^{+2.9}_{-2.9}$     |
| $A_{217}^{\mathrm{CIB}}$                 | $38^{+10}_{-10}$                | $D_{810}$                             | $2528^{+27}_{-27}$              | $D_{\mathrm{M}}(2.33)$      | $5751^{+40}_{-42}$        |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.57$                        | $D_{1420}$                            | $815^{+10}_{-10}$               | $f\sigma_8(0.15)$           | $0.474^{+0.026}_{-0.025}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.67^{+0.26}_{-0.27}$          | $D_{2000}$                            | $231.6^{+4.2}_{-4.2}$           | $\sigma_8(0.15)$            | $0.789^{+0.041}_{-0.040}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $n_{\mathrm{s},0.002}$                | $0.974^{+0.016}_{-0.015}$       | $f\sigma_8(0.38)$           | $0.495^{+0.024}_{-0.024}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}$                      | $0.24542^{+0.00022}_{-0.00022}$ | $\sigma_8(0.38)$            | $0.701^{+0.038}_{-0.037}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24674^{+0.00022}_{-0.00022}$ | $f\sigma_8(0.51)$           | $0.495^{+0.023}_{-0.023}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $10^5 \mathrm{D}/\mathrm{H}$          | $2.576^{+0.098}_{-0.097}$       | $\sigma_8(0.51)$            | $0.656^{+0.037}_{-0.035}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.771^{+0.089}_{-0.092}$      | $f\sigma_8(0.61)$           | $0.491^{+0.023}_{-0.023}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $z_*$                                 | $1089.6^{+1.0}_{-0.99}$         | $\sigma_8(0.61)$            | $0.625^{+0.035}_{-0.034}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $r_*$                                 | $145.0^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | $0.315^{+0.019}_{-0.018}$ |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                         | $1.0414^{+0.0010}_{-0.00098}$   | $\sigma_8(2.33)$            | $0.326^{+0.020}_{-0.019}$ |
| $c_{217}$                                | $1.0009^{+0.0031}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.924^{+0.098}_{-0.098}$      | $f_{2000}^{143}$            | $27^{+7}_{-7}$            |
| $H_0$                                    | $68.4^{+2.3}_{-2.3}$            | $z_{\mathrm{drag}}$                   | $1059.9^{+1.0}_{-1.0}$          | $f_{2000}^{217}$            | $105.2^{+4.6}_{-4.6}$     |
| $\Omega_{\Lambda}$                       | $0.698^{+0.029}_{-0.031}$       | $r_{\mathrm{drag}}$                   | $147.7^{+1.0}_{-1.0}$           | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$            |
| $\Omega_{\mathrm{m}}$                    | $0.302^{+0.031}_{-0.029}$       | $k_{\mathrm{D}}$                      | $0.1403^{+0.0011}_{-0.0010}$    | $\chi_{\mathrm{lowl}}^2$    | $24.8 (\nu: 1.4)$         |
| $\Omega_{\mathrm{m}} h^2$                | $0.1407^{+0.0046}_{-0.0046}$    | $100\theta_{\mathrm{D}}$              | $0.16081^{+0.00058}_{-0.00056}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7060.0 (\nu: 14.7)$      |
| $\Omega_{\mathrm{m}} h^3$                | $0.09616^{+0.00097}_{-0.00092}$ | $z_{\mathrm{eq}}$                     | $3347^{+110}_{-110}$            | $\chi_{\mathrm{prior}}^2$   | $7.4 (\nu: 5.6)$          |
| $\sigma_8$                               | $0.853^{+0.043}_{-0.042}$       | $k_{\mathrm{eq}}$                     | $0.01022^{+0.00034}_{-0.00033}$ | $\chi_{\mathrm{CMB}}^2$     | $7084.8 (\nu: 14.3)$      |
| $S_8$                                    | $0.854^{+0.050}_{-0.048}$       | $100\theta_{\mathrm{eq}}$             | $0.824^{+0.022}_{-0.021}$       |                             |                           |

$\bar{\chi}_{\mathrm{eff}}^2 = 7092.14$ ;  $R - 1 = 0.00760$



## 2.71 base\_CamSpecHM\_TT\_lowl\_post\_BAO\_zre6p5

| Parameter  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                                 | $0.02239^{+0.00042}_{-0.00041}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.632^{+0.030}_{-0.030}$       | $D_{\mathrm{M}}(0.15)$      | $636.8^{+9.8}_{-9.8}$     |
| $\Omega_{\mathrm{c}}h^2$                                 | $0.1181^{+0.0025}_{-0.0025}$    | $\sigma_8/h^{0.5}$                   | $1.030^{+0.049}_{-0.049}$       | $H(0.38)$                   | $83.32^{+0.78}_{-0.75}$   |
| $100\theta_{\mathrm{MC}}$                                | $1.04117^{+0.00088}_{-0.00085}$ | $r_{\mathrm{drag}}h$                 | $100.6^{+2.0}_{-1.9}$           | $D_{\mathrm{M}}(0.38)$      | $1521^{+20}_{-20}$        |
| $\tau$   | $0.110^{+0.052}_{-0.053}$       | $\langle d^2 \rangle^{1/2}$          | $2.54^{+0.11}_{-0.11}$          | $H(0.51)$                   | $89.96^{+0.64}_{-0.63}$   |
| $\ln(10^{10}A_{\mathrm{s}})$                             | $3.149^{+0.099}_{-0.10}$        | $z_{\mathrm{re}}$                    | $12.6^{+3.8}_{-4.5}$            | $D_{\mathrm{M}}(0.51)$      | $1971^{+23}_{-23}$        |
| $n_{\mathrm{s}}$   | $0.9722^{+0.0098}_{-0.0097}$    | $10^9 A_{\mathrm{s}}$                | $2.33^{+0.24}_{-0.23}$          | $H(0.61)$                   | $95.52^{+0.56}_{-0.53}$   |
| $y_{\mathrm{cal}}$                                       | $1.0003^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.870^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2294^{+25}_{-25}$        |
| $A_{100}^{\mathrm{PS}}$                                  | $233^{+50}_{-50}$               | $D_{40}$                             | $1237^{+31}_{-30}$              | $H(2.33)$                   | $235.3^{+1.5}_{-1.5}$     |
| $A_{143}^{\mathrm{PS}}$                                  | $36^{+20}_{-20}$                | $D_{220}$                            | $5707^{+79}_{-78}$              | $D_{\mathrm{M}}(2.33)$      | $5755^{+26}_{-27}$        |
| $A_{217}^{\mathrm{PS}}$                                  | $104^{+20}_{-30}$               | $D_{810}$                            | $2529^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.474^{+0.023}_{-0.023}$ |
| $A_{217}^{\mathrm{CIB}}$                                 | $38^{+20}_{-10}$                | $D_{1420}$                           | $814.9^{+9.8}_{-9.8}$           | $\sigma_8(0.15)$            | $0.787^{+0.039}_{-0.039}$ |
| $A_{143}^{\mathrm{tSZ}}$                                 | $< 7.57$                        | $D_{2000}$                           | $231.4^{+3.8}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.495^{+0.023}_{-0.023}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$                       | $0.67^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$               | $0.9722^{+0.0098}_{-0.0097}$    | $\sigma_8(0.38)$            | $0.698^{+0.035}_{-0.035}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$                      | —                               | $Y_{\mathrm{P}}$                     | $0.24540^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.51)$           | $0.495^{+0.024}_{-0.023}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$                 | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24673^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.654^{+0.033}_{-0.033}$ |
| $A^{\mathrm{kSZ}}$                                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.582^{+0.078}_{-0.076}$       | $f\sigma_8(0.61)$           | $0.490^{+0.023}_{-0.023}$ |
| $A_{100}^{\mathrm{dust}}$                                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.779^{+0.060}_{-0.061}$      | $\sigma_8(0.61)$            | $0.622^{+0.032}_{-0.032}$ |
| $A_{143}^{\mathrm{dust}}$                                | $0.96^{+0.35}_{-0.36}$          | $z_*$                                | $1089.73^{+0.62}_{-0.63}$       | $f\sigma_8(2.33)$           | $0.314^{+0.016}_{-0.016}$ |
| $A_{217}^{\mathrm{dust}}$                                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                | $144.91^{+0.62}_{-0.62}$        | $\sigma_8(2.33)$            | $0.324^{+0.017}_{-0.017}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$                     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04136^{+0.00087}_{-0.00083}$ | $f_{2000}^{143}$            | $28^{+6}_{-6}$            |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.916^{+0.061}_{-0.061}$      | $f_{2000}^{217}$            | $105.5^{+4.4}_{-4.4}$     |
| $c_{217}$  | $1.0010^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.85^{+0.93}_{-0.91}$       | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$            |
| $H_0$  | $68.1^{+1.2}_{-1.1}$            | $r_{\mathrm{drag}}$                  | $147.58^{+0.67}_{-0.69}$        | $\chi_{\mathrm{lowl}}^2$    | $24.7 (\nu: 1.3)$         |
| $\Omega_{\Lambda}$                                       | $0.696^{+0.015}_{-0.015}$       | $k_{\mathrm{D}}$                     | $0.14037^{+0.00090}_{-0.00089}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7059.5 (\nu: 14.2)$      |
| $\Omega_{\mathrm{m}}$                                    | $0.304^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{D}}$             | $0.16083^{+0.00054}_{-0.00053}$ | $\chi_{6\mathrm{DF}}^2$     | $0.043 (\nu: 0.0)$        |
| $\Omega_{\mathrm{m}}h^2$                                 | $0.1411^{+0.0024}_{-0.0024}$    | $z_{\mathrm{eq}}$                    | $3357^{+57}_{-57}$              | $\chi_{\mathrm{MGS}}^2$     | $1.82 (\nu: 0.2)$         |
| $\Omega_{\mathrm{m}}h^3$                                 | $0.09615^{+0.00098}_{-0.00093}$ | $k_{\mathrm{eq}}$                    | $0.01025^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.1 (\nu: 0.5)$          |
| $\sigma_8$   | $0.851^{+0.042}_{-0.041}$       | $100\theta_{\mathrm{eq}}$            | $0.822^{+0.011}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$   | $7.4 (\nu: 5.5)$          |
| $S_8$  | $0.856^{+0.043}_{-0.043}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4538^{+0.0057}_{-0.0056}$    | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.6)$          |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$                      | $0.469^{+0.024}_{-0.023}$       | $H(0.15)$                            | $73.3^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $7084.2 (\nu: 13.8)$      |
| $\bar{\chi}_{\mathrm{eff}}^2 = 7097.56; R - 1 = 0.01150$ |                                 |                                      |                                 |                             |                           |



## 2.72 base\_CamSpecHM\_TT\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022053 | $0.02207^{+0.00043}_{-0.00041}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4653   | $0.465^{+0.027}_{-0.026}$       | $100\theta_{s,eq}$          | 0.4462   | $0.4464^{+0.0092}_{-0.0091}$ |
| $\Omega_c h^2$              | 0.12163  | $0.1216^{+0.0043}_{-0.0042}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6154   | $0.615^{+0.023}_{-0.024}$       | $H(0.15)$                   | 71.90    | $71.9^{+1.6}_{-1.5}$         |
| $100\theta_{MC}$            | 1.04072  | $1.04073^{+0.00094}_{-0.00094}$ | $\sigma_8/h^{0.5}$          | 0.9985   | $0.998^{+0.032}_{-0.033}$       | $D_M(0.15)$                 | 651.2    | $651^{+16}_{-16}$            |
| $\tau$                      | 0.0513   | $0.052^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 97.71    | $97.8^{+3.2}_{-3.2}$            | $H(0.38)$                   | 82.27    | $82.3^{+1.1}_{-1.1}$         |
| $\ln(10^{10} A_s)$          | 3.0400   | $3.041^{+0.032}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$ | 2.471    | $2.469^{+0.076}_{-0.078}$       | $D_M(0.38)$                 | 1549.3   | $1549^{+32}_{-31}$           |
| $n_s$                       | 0.9590   | $0.960^{+0.012}_{-0.012}$       | $z_{re}$                    | 7.47     | $7.5^{+1.6}_{-1.7}$             | $H(0.51)$                   | 89.13    | $89.17^{+0.89}_{-0.83}$      |
| $y_{cal}$                   | 1.00029  | $1.0004^{+0.0050}_{-0.0050}$    | $10^9 A_s$                  | 2.091    | $2.092^{+0.067}_{-0.067}$       | $D_M(0.51)$                 | 2004.6   | $2004^{+37}_{-37}$           |
| $A_{100}^{PS}$              | 248.9    | $245^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8866   | $1.887^{+0.027}_{-0.027}$       | $H(0.61)$                   | 94.87    | $94.90^{+0.71}_{-0.65}$      |
| $A_{143}^{PS}$              | 39.9     | $42^{+20}_{-20}$                | $D_{40}$                    | 1240.5   | $1239^{+32}_{-31}$              | $D_M(0.61)$                 | 2330.7   | $2330^{+39}_{-39}$           |
| $A_{217}^{PS}$              | 97.9     | $100^{+30}_{-30}$               | $D_{220}$                   | 5710     | $5709^{+81}_{-81}$              | $H(2.33)$                   | 237.30   | $237.3^{+2.6}_{-2.5}$        |
| $A_{217}^{CIB}$             | 44.6     | $42^{+10}_{-10}$                | $D_{810}$                   | 2533.3   | $2534^{+27}_{-28}$              | $D_M(2.33)$                 | 5783.3   | $5782^{+31}_{-32}$           |
| $A_{143}^{tSZ}$             | 4.22     | $< 7.28$                        | $D_{1420}$                  | 812.1    | $813^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4686   | $0.468^{+0.024}_{-0.024}$    |
| $r_{143 \times 217}^{PS}$   | 0.539    | $0.64^{+0.25}_{-0.25}$          | $D_{2000}$                  | 228.72   | $229.0^{+3.6}_{-3.5}$           | $\sigma_8(0.15)$            | 0.7507   | $0.751^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{CIB}$  | 0.69     | —                               | $n_{s,0.002}$               | 0.9590   | $0.960^{+0.012}_{-0.012}$       | $f\sigma_8(0.38)$           | 0.4836   | $0.483^{+0.019}_{-0.019}$    |
| $\xi^{tSZ \times CIB}$      | 0.01     | —                               | $Y_P$                       | 0.245264 | $0.24526^{+0.00018}_{-0.00020}$ | $\sigma_8(0.38)$            | 0.6638   | $0.664^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | 3.9      | —                               | $Y_P^{BBN}$                 | 0.246590 | $0.24659^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.51)$           | 0.4804   | $0.480^{+0.016}_{-0.017}$    |
| $A_{100}^{dust}$            | 1.005    | $1.01^{+0.38}_{-0.38}$          | $10^5 D/H$                  | 2.646    | $2.643^{+0.080}_{-0.082}$       | $\sigma_8(0.51)$            | 0.6206   | $0.621^{+0.011}_{-0.011}$    |
| $A_{143}^{dust}$            | 0.986    | $0.97^{+0.34}_{-0.35}$          | Age/Gyr                     | 13.842   | $13.839^{+0.069}_{-0.072}$      | $f\sigma_8(0.61)$           | 0.4742   | $0.474^{+0.014}_{-0.015}$    |
| $A_{217}^{dust}$            | 0.958    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1090.47  | $1090.44^{+0.80}_{-0.80}$       | $\sigma_8(0.61)$            | 0.5901   | $0.590^{+0.010}_{-0.010}$    |
| $A_{143 \times 217}^{dust}$ | 1.001    | $1.03^{+0.32}_{-0.31}$          | $r_*$                       | 144.25   | $144.26^{+0.96}_{-0.96}$        | $f\sigma_8(2.33)$           | 0.29692  | $0.2971^{+0.0050}_{-0.0049}$ |
| $c_{100}$                   | 0.99748  | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | 1.04094  | $1.04094^{+0.00092}_{-0.00093}$ | $\sigma_8(2.33)$            | 0.3055   | $0.3056^{+0.0053}_{-0.0052}$ |
| $c_{217}$                   | 1.00140  | $1.0013^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | 13.858   | $13.859^{+0.088}_{-0.090}$      | $f_{2000}^{143}$            | 32.3     | $32^{+6}_{-6}$               |
| $H_0$                       | 66.46    | $66.5^{+1.8}_{-1.8}$            | $z_{drag}$                  | 1059.32  | $1059.35^{+0.89}_{-0.87}$       | $f_{2000}^{217}$            | 108.39   | $108.0^{+4.0}_{-4.0}$        |
| $\Omega_\Lambda$            | 0.6733   | $0.674^{+0.026}_{-0.028}$       | $r_{drag}$                  | 147.02   | $147.02^{+0.96}_{-0.96}$        | $f_{2000}^{143 \times 217}$ | 33.80    | $34^{+4}_{-4}$               |
| $\Omega_m$                  | 0.3267   | $0.326^{+0.028}_{-0.026}$       | $k_D$                       | 0.14070  | $0.1407^{+0.0010}_{-0.0010}$    | $\chi_{small}^2$            | 395.83   | $397.0 (\nu: 1.4)$           |
| $\Omega_m h^2$              | 0.14433  | $0.1443^{+0.0041}_{-0.0040}$    | $100\theta_D$               | 0.16112  | $0.16111^{+0.00051}_{-0.00052}$ | $\chi_{CamSpec}^2$          | 7049.7   | $7062.9 (\nu: 14.0)$         |
| $\Omega_m h^3$              | 0.09592  | $0.09594^{+0.00089}_{-0.00087}$ | $z_{eq}$                    | 3434     | $3432^{+98}_{-95}$              | $\chi_{prior}^2$            | 2.3      | $7.7 (\nu: 6.1)$             |
| $\sigma_8$                  | 0.8140   | $0.814^{+0.017}_{-0.018}$       | $k_{eq}$                    | 0.010479 | $0.01048^{+0.00030}_{-0.00029}$ | $\chi_{CMB}^2$              | 7445.5   | $7459.8 (\nu: 15.0)$         |
| $S_8$                       | 0.8495   | $0.849^{+0.049}_{-0.048}$       | $100\theta_{eq}$            | 0.8067   | $0.807^{+0.018}_{-0.018}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7447.83$ ;  $\bar{\chi}_{eff}^2 = 7467.49$ ;  $R - 1 = 0.00861$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.83 CamSpec like\_10.7HM: 7049.71



## 2.73 base\_CamSpecHM\_TTTEE

| Parameter                            | Best fit | 95% limits                      | Parameter                           | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      |
|--------------------------------------|----------|---------------------------------|-------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|
| $\Omega_b h^2$                       | 0.022485 | $0.02246^{+0.00039}_{-0.00037}$ | $\sigma_8$                          | 0.8525   | $0.850^{+0.051}_{-0.046}$       | $k_{\text{eq}}$             | 0.010269 | $0.01027^{+0.00023}_{-0.00023}$ |
| $\Omega_c h^2$                       | 0.11831  | $0.1183^{+0.0033}_{-0.0034}$    | $S_8$                               | 0.8597   | $0.858^{+0.044}_{-0.043}$       | $100\theta_{\text{eq}}$     | 0.8205   | $0.821^{+0.015}_{-0.014}$       |
| $100\theta_{\text{MC}}$              | 1.04104  | $1.04104^{+0.00067}_{-0.00065}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | 0.4709   | $0.470^{+0.024}_{-0.023}$       | $100\theta_{\text{s,eq}}$   | 0.4531   | $0.4531^{+0.0076}_{-0.0073}$    |
| $\tau$                               | 0.112    | $0.110^{+0.069}_{-0.063}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | 0.6336   | $0.632^{+0.033}_{-0.031}$       | $H(0.15)$                   | 73.30    | $73.3^{+1.4}_{-1.3}$            |
| $\ln(10^{10} A_{\text{s}})$          | 3.154    | $3.15^{+0.13}_{-0.12}$          | $\sigma_8/h^{0.5}$                  | 1.033    | $1.031^{+0.055}_{-0.052}$       | $D_{\text{M}}(0.15)$        | 637.2    | $637^{+13}_{-13}$               |
| $n_{\text{s}}$                       | 0.9714   | $0.970^{+0.012}_{-0.011}$       | $r_{\text{drag}} h$                 | 100.37   | $100.4^{+2.8}_{-2.6}$           | $H(0.38)$                   | 83.31    | $83.3^{+1.0}_{-0.95}$           |
| $A_{100}^{\text{PS}}$                | 221.2    | $233^{+50}_{-50}$               | $\langle d^2 \rangle^{1/2}$         | 2.551    | $2.55^{+0.13}_{-0.13}$          | $D_{\text{M}}(0.38)$        | 1521.1   | $1522^{+26}_{-27}$              |
| $A_{143}^{\text{PS}}$                | 48.6     | $36^{+20}_{-20}$                | $z_{\text{re}}$                     | 12.8     | $12.4^{+5.0}_{-5.5}$            | $H(0.51)$                   | 89.96    | $89.95^{+0.82}_{-0.75}$         |
| $A_{217}^{\text{PS}}$                | 107.7    | $104^{+20}_{-30}$               | $10^9 A_{\text{s}}$                 | 2.343    | $2.34^{+0.32}_{-0.27}$          | $D_{\text{M}}(0.51)$        | 1971.5   | $1972^{+30}_{-32}$              |
| $A_{217}^{\text{CIB}}$               | 39.2     | $37^{+10}_{-10}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | 1.8728   | $1.872^{+0.025}_{-0.025}$       | $H(0.61)$                   | 95.53    | $95.52^{+0.66}_{-0.60}$         |
| $A_{143}^{\text{tSZ}}$               | 6.49     | $< 7.56$                        | $D_{40}$                            | 1240.1   | $1243^{+32}_{-31}$              | $D_{\text{M}}(0.61)$        | 2295.0   | $2295^{+33}_{-34}$              |
| $r_{143 \times 217}^{\text{PS}}$     | 0.774    | $0.68^{+0.25}_{-0.26}$          | $D_{220}$                           | 5721     | $5722^{+77}_{-74}$              | $H(2.33)$                   | 235.57   | $235.6^{+1.9}_{-2.0}$           |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.87     | —                               | $D_{810}$                           | 2531.0   | $2529^{+27}_{-27}$              | $D_{\text{M}}(2.33)$        | 5753.1   | $5754^{+27}_{-29}$              |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.999    | —                               | $D_{1420}$                          | 815.9    | $814.7^{+9.5}_{-9.3}$           | $f\sigma_8(0.15)$           | 0.4762   | $0.475^{+0.024}_{-0.023}$       |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $D_{2000}$                          | 231.86   | $231.4^{+3.7}_{-3.5}$           | $\sigma_8(0.15)$            | 0.7884   | $0.786^{+0.049}_{-0.044}$       |
| $A_{100}^{\text{dust}}$              | 0.995    | $1.00^{+0.38}_{-0.38}$          | $n_{\text{s},0.002}$                | 0.9714   | $0.970^{+0.012}_{-0.011}$       | $f\sigma_8(0.38)$           | 0.4971   | $0.496^{+0.026}_{-0.025}$       |
| $A_{143}^{\text{dust}}$              | 0.963    | $0.95^{+0.34}_{-0.34}$          | $Y_{\text{P}}$                      | 0.245439 | $0.24543^{+0.00015}_{-0.00015}$ | $\sigma_8(0.38)$            | 0.6996   | $0.698^{+0.045}_{-0.040}$       |
| $A_{217}^{\text{dust}}$              | 0.987    | $0.98^{+0.20}_{-0.20}$          | $Y_{\text{P}}^{\text{BBN}}$         | 0.246766 | $0.24676^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | 0.4964   | $0.495^{+0.026}_{-0.025}$       |
| $A_{143 \times 217}^{\text{dust}}$   | 0.998    | $1.02^{+0.32}_{-0.31}$          | $10^5 D/\text{H}$                   | 2.565    | $2.569^{+0.070}_{-0.070}$       | $\sigma_8(0.51)$            | 0.6550   | $0.653^{+0.043}_{-0.038}$       |
| $y_{\text{cal}}$                     | 1.00001  | $1.0001^{+0.0049}_{-0.0048}$    | Age/Gyr                             | 13.775   | $13.777^{+0.060}_{-0.064}$      | $f\sigma_8(0.61)$           | 0.4917   | $0.490^{+0.027}_{-0.025}$       |
| $c_{100}$                            | 0.99792  | $0.9976^{+0.0021}_{-0.0021}$    | $z_*$                               | 1089.63  | $1089.66^{+0.69}_{-0.71}$       | $\sigma_8(0.61)$            | 0.6235   | $0.622^{+0.041}_{-0.036}$       |
| $c_{217}$                            | 1.00103  | $1.0009^{+0.0031}_{-0.0031}$    | $r_*$                               | 144.78   | $144.80^{+0.72}_{-0.70}$        | $f\sigma_8(2.33)$           | 0.3146   | $0.314^{+0.021}_{-0.019}$       |
| $c_{TE}$                             | 0.9925   | $0.992^{+0.011}_{-0.011}$       | $100\theta_*$                       | 1.04122  | $1.04122^{+0.00065}_{-0.00064}$ | $\sigma_8(2.33)$            | 0.3247   | $0.324^{+0.023}_{-0.020}$       |
| $c_{EE}$                             | 0.9903   | $0.9903^{+0.010}_{-0.0098}$     | $D_{\text{M}}(z_*)/\text{Gpc}$      | 13.905   | $13.907^{+0.065}_{-0.065}$      | $f_{2000}^{143}$            | 27.3     | $27^{+6}_{-6}$                  |
| $H_0$                                | 68.09    | $68.1^{+1.6}_{-1.5}$            | $z_{\text{drag}}$                   | 1060.09  | $1060.03^{+0.74}_{-0.71}$       | $f_{2000}^{217}$            | 104.70   | $105.3^{+4.3}_{-4.3}$           |
| $\Omega_{\Lambda}$                   | 0.6949   | $0.695^{+0.020}_{-0.021}$       | $r_{\text{drag}}$                   | 147.41   | $147.44^{+0.69}_{-0.68}$        | $f_{2000}^{143 \times 217}$ | 30.06    | $30^{+5}_{-5}$                  |
| $\Omega_{\text{m}}$                  | 0.3051   | $0.305^{+0.021}_{-0.020}$       | $k_{\text{D}}$                      | 0.14062  | $0.14057^{+0.00070}_{-0.00071}$ | $\chi_{\text{CamSpec}}^2$   | 11495.8  | $11512.0 (\nu: 15.9)$           |
| $\Omega_{\text{m}} h^2$              | 0.14144  | $0.1414^{+0.0031}_{-0.0031}$    | $100\theta_{\text{D}}$              | 0.160674 | $0.16071^{+0.00042}_{-0.00043}$ | $\chi_{\text{prior}}^2$     | 1.9      | $7.7 (\nu: 5.5)$                |
| $\Omega_{\text{m}} h^3$              | 0.09630  | $0.09626^{+0.00064}_{-0.00063}$ | $z_{\text{eq}}$                     | 3364     | $3364^{+74}_{-75}$              |                             |          |                                 |

Best-fit  $\chi_{\text{eff}}^2 = 11497.65$ ;  $\bar{\chi}_{\text{eff}}^2 = 11519.77$ ;  $R - 1 = 0.00880$

$\chi_{\text{eff}}^2$ : CMB - CamSpec like\_10.7HM\_1400\_unified: 11495.79



## 2.74 base\_CamSpecHM\_TTTEE\_lowl

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022467 | $0.02243^{+0.00038}_{-0.00035}$ | $S_8$                       | 0.8498   | $0.846^{+0.041}_{-0.041}$       | $100\theta_{s,eq}$          | 0.4533   | $0.4530^{+0.0068}_{-0.0067}$ |
| $\Omega_c h^2$              | 0.11820  | $0.1184^{+0.0031}_{-0.0030}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4655   | $0.463^{+0.022}_{-0.022}$       | $H(0.15)$                   | 73.32    | $73.2^{+1.2}_{-1.2}$         |
| $100\theta_{MC}$            | 1.04104  | $1.04102^{+0.00064}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6265   | $0.623^{+0.029}_{-0.029}$       | $D_M(0.15)$                 | 637.0    | $638^{+12}_{-12}$            |
| $\tau$                      | 0.101    | $0.094^{+0.055}_{-0.057}$       | $\sigma_8/h^{0.5}$          | 1.0219   | $1.015^{+0.047}_{-0.048}$       | $H(0.38)$                   | 83.31    | $83.25^{+0.93}_{-0.88}$      |
| $\ln(10^{10} A_s)$          | 3.132    | $3.12^{+0.11}_{-0.11}$          | $r_{drag} h$                | 100.44   | $100.3^{+2.5}_{-2.4}$           | $D_M(0.38)$                 | 1520.8   | $1523^{+24}_{-24}$           |
| $n_s$                       | 0.9723   | $0.971^{+0.011}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$ | 2.521    | $2.51^{+0.11}_{-0.11}$          | $H(0.51)$                   | 89.96    | $89.91^{+0.74}_{-0.70}$      |
| $y_{cal}$                   | 1.00023  | $1.0002^{+0.0049}_{-0.0047}$    | $z_{re}$                    | 11.89    | $11.2^{+4.6}_{-5.0}$            | $D_M(0.51)$                 | 1971.2   | $1973^{+28}_{-29}$           |
| $A_{100}^{PS}$              | 221.6    | $234^{+50}_{-50}$               | $10^9 A_s$                  | 2.293    | $2.26^{+0.25}_{-0.24}$          | $H(0.61)$                   | 95.53    | $95.48^{+0.60}_{-0.56}$      |
| $A_{143}^{PS}$              | 48.3     | $37^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8726   | $1.872^{+0.024}_{-0.023}$       | $D_M(0.61)$                 | 2294.6   | $2297^{+30}_{-31}$           |
| $A_{217}^{PS}$              | 108.5    | $104^{+30}_{-30}$               | $D_{40}$                    | 1231.7   | $1233^{+28}_{-26}$              | $H(2.33)$                   | 235.48   | $235.6^{+1.8}_{-1.8}$        |
| $A_{217}^{CIB}$             | 38.8     | $38^{+10}_{-10}$                | $D_{220}$                   | 5716     | $5716^{+74}_{-73}$              | $D_M(2.33)$                 | 5753.6   | $5756^{+26}_{-27}$           |
| $A_{143}^{tSZ}$             | 6.38     | $< 7.53$                        | $D_{810}$                   | 2532.6   | $2531^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4708   | $0.468^{+0.022}_{-0.022}$    |
| $r_{143 \times 217}^{PS}$   | 0.768    | $0.67^{+0.26}_{-0.26}$          | $D_{1420}$                  | 816.9    | $815.5^{+9.4}_{-9.2}$           | $\sigma_8(0.15)$            | 0.7800   | $0.774^{+0.039}_{-0.040}$    |
| $r_{143 \times 217}^{CIB}$  | 0.84     | —                               | $D_{2000}$                  | 231.94   | $231.3^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | 0.4915   | $0.489^{+0.022}_{-0.023}$    |
| $\xi^{tSZ \times CIB}$      | 0.96     | —                               | $n_{s,0.002}$               | 0.9723   | $0.971^{+0.011}_{-0.010}$       | $\sigma_8(0.38)$            | 0.6922   | $0.687^{+0.036}_{-0.036}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P$                       | 0.245433 | $0.24542^{+0.00014}_{-0.00014}$ | $f\sigma_8(0.51)$           | 0.4909   | $0.488^{+0.023}_{-0.023}$    |
| $A_{100}^{dust}$            | 1.000    | $1.00^{+0.39}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246759 | $0.24674^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | 0.6481   | $0.643^{+0.034}_{-0.034}$    |
| $A_{143}^{dust}$            | 0.960    | $0.95^{+0.34}_{-0.35}$          | $10^5 D/H$                  | 2.568    | $2.575^{+0.066}_{-0.067}$       | $f\sigma_8(0.61)$           | 0.4863   | $0.483^{+0.022}_{-0.023}$    |
| $A_{217}^{dust}$            | 0.993    | $0.98^{+0.20}_{-0.20}$          | Age/Gyr                     | 13.776   | $13.781^{+0.057}_{-0.059}$      | $\sigma_8(0.61)$            | 0.6169   | $0.612^{+0.033}_{-0.033}$    |
| $A_{143 \times 217}^{dust}$ | 1.008    | $1.01^{+0.32}_{-0.32}$          | $z_*$                       | 1089.64  | $1089.70^{+0.64}_{-0.66}$       | $f\sigma_8(2.33)$           | 0.3114   | $0.309^{+0.017}_{-0.017}$    |
| $c_{100}$                   | 0.99782  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                       | 144.82   | $144.81^{+0.66}_{-0.66}$        | $\sigma_8(2.33)$            | 0.3213   | $0.319^{+0.018}_{-0.018}$    |
| $c_{217}$                   | 1.00104  | $1.0009^{+0.0032}_{-0.0031}$    | $100\theta_*$               | 1.04122  | $1.04120^{+0.00063}_{-0.00064}$ | $f_{2000}^{143}$            | 27.4     | $28^{+6}_{-6}$               |
| $c_{TE}$                    | 0.9932   | $0.994^{+0.011}_{-0.010}$       | $D_M(z_*)/\text{Gpc}$       | 13.909   | $13.908^{+0.061}_{-0.061}$      | $f_{2000}^{217}$            | 104.79   | $105.5^{+4.2}_{-4.2}$        |
| $c_{EE}$                    | 0.9906   | $0.9907^{+0.0097}_{-0.0097}$    | $z_{drag}$                  | 1060.05  | $1059.96^{+0.74}_{-0.67}$       | $f_{2000}^{143 \times 217}$ | 30.07    | $31^{+4}_{-5}$               |
| $H_0$                       | 68.11    | $68.0^{+1.4}_{-1.4}$            | $r_{drag}$                  | 147.46   | $147.46^{+0.65}_{-0.63}$        | $\chi_{lowl}^2$             | 23.92    | $24.1 (\nu: 0.9)$            |
| $\Omega_\Lambda$            | 0.6954   | $0.694^{+0.018}_{-0.019}$       | $k_D$                       | 0.14055  | $0.14053^{+0.00066}_{-0.00068}$ | $\chi_{CamSpec}^2$          | 11496.2  | $11512.2 (\nu: 16.0)$        |
| $\Omega_m$                  | 0.3046   | $0.306^{+0.019}_{-0.018}$       | $100\theta_D$               | 0.160702 | $0.16075^{+0.00040}_{-0.00041}$ | $\chi_{prior}^2$            | 1.9      | $7.8 (\nu: 5.7)$             |
| $\Omega_m h^2$              | 0.14131  | $0.1415^{+0.0029}_{-0.0028}$    | $z_{eq}$                    | 3361     | $3365^{+69}_{-68}$              | $\chi_{CMB}^2$              | 11520.1  | $11536.3 (\nu: 15.7)$        |
| $\Omega_m h^3$              | 0.09625  | $0.09620^{+0.00062}_{-0.00063}$ | $k_{eq}$                    | 0.010259 | $0.01027^{+0.00021}_{-0.00021}$ |                             |          |                              |
| $\sigma_8$                  | 0.8434   | $0.837^{+0.042}_{-0.042}$       | $100\theta_{eq}$            | 0.8210   | $0.820^{+0.013}_{-0.013}$       |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11522.05$ ;  $\bar{\chi}_{\text{eff}}^2 = 11544.10$ ;  $R - 1 = 0.00836$

$\chi_{\text{eff}}^2$ : CMB - commander\_dx12\_v3\_2\_29: 23.92 CamSpec like\_10.7HM\_1400\_unified: 11496.23



## 2.75 base\_CamSpecHM\_TTTEEE\_lowl\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02244^{+0.00032}_{-0.00031}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.463^{+0.021}_{-0.022}$       | $D_M(0.15)$                 | $637.4^{+8.2}_{-8.1}$     |
| $\Omega_c h^2$                       | $0.1183^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.623^{+0.028}_{-0.029}$       | $H(0.38)$                   | $83.28^{+0.63}_{-0.62}$   |
| $100\theta_{MC}$                     | $1.04103^{+0.00058}_{-0.00058}$ | $\sigma_8/h^{0.5}$          | $1.015^{+0.045}_{-0.048}$       | $D_M(0.38)$                 | $1522^{+17}_{-17}$        |
| $\tau$                               | $0.095^{+0.049}_{-0.053}$       | $r_{\text{drag}} h$         | $100.4^{+1.7}_{-1.6}$           | $H(0.51)$                   | $89.93^{+0.51}_{-0.50}$   |
| $\ln(10^{10} A_s)$                   | $3.119^{+0.095}_{-0.10}$        | $\langle d^2 \rangle^{1/2}$ | $2.51^{+0.11}_{-0.11}$          | $D_M(0.51)$                 | $1972^{+19}_{-20}$        |
| $n_s$                                | $0.9709^{+0.0087}_{-0.0085}$    | $z_{\text{re}}$             | $11.3^{+4.1}_{-4.5}$            | $H(0.61)$                   | $95.50^{+0.43}_{-0.41}$   |
| $y_{\text{cal}}$                     | $1.0002^{+0.0049}_{-0.0047}$    | $10^9 A_s$                  | $2.26^{+0.22}_{-0.23}$          | $D_M(0.61)$                 | $2296^{+21}_{-21}$        |
| $A_{100}^{\text{PS}}$                | $233^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.872^{+0.022}_{-0.021}$       | $H(2.33)$                   | $235.5^{+1.3}_{-1.3}$     |
| $A_{143}^{\text{PS}}$                | $36^{+20}_{-20}$                | $D_{40}$                    | $1232^{+28}_{-26}$              | $D_M(2.33)$                 | $5755^{+20}_{-20}$        |
| $A_{217}^{\text{PS}}$                | $104^{+30}_{-30}$               | $D_{220}$                   | $5717^{+74}_{-72}$              | $f\sigma_8(0.15)$           | $0.468^{+0.021}_{-0.022}$ |
| $A_{217}^{\text{CIB}}$               | $38^{+10}_{-10}$                | $D_{810}$                   | $2530^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.775^{+0.036}_{-0.038}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.60$                        | $D_{1420}$                  | $815.6^{+9.4}_{-9.1}$           | $f\sigma_8(0.38)$           | $0.488^{+0.022}_{-0.023}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.3^{+3.3}_{-3.2}$           | $\sigma_8(0.38)$            | $0.688^{+0.033}_{-0.034}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9709^{+0.0087}_{-0.0085}$    | $f\sigma_8(0.51)$           | $0.488^{+0.022}_{-0.023}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24542^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.644^{+0.031}_{-0.032}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24675^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.483^{+0.022}_{-0.023}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.38}$          | $10^5 D/H$                  | $2.574^{+0.057}_{-0.057}$       | $\sigma_8(0.61)$            | $0.613^{+0.030}_{-0.031}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.34}$          | Age/Gyr                     | $13.780^{+0.044}_{-0.046}$      | $f\sigma_8(2.33)$           | $0.309^{+0.015}_{-0.016}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.68^{+0.50}_{-0.50}$       | $\sigma_8(2.33)$            | $0.319^{+0.016}_{-0.016}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.31}_{-0.31}$          | $r_*$                       | $144.83^{+0.49}_{-0.48}$        | $f_{2000}^{143}$            | $28^{+6}_{-6}$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04121^{+0.00057}_{-0.00058}$ | $f_{2000}^{217}$            | $105.5^{+4.0}_{-4.0}$     |
| $c_{217}$                            | $1.0009^{+0.0032}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.046}_{-0.046}$      | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$            |
| $c_{TE}$                             | $0.994^{+0.010}_{-0.010}$       | $z_{\text{drag}}$           | $1059.97^{+0.65}_{-0.64}$       | $\chi_{\text{lowl}}^2$      | $24.1 (\nu: 0.9)$         |
| $c_{EE}$                             | $0.9907^{+0.0097}_{-0.0096}$    | $r_{\text{drag}}$           | $147.48^{+0.51}_{-0.49}$        | $\chi_{\text{CamSpec}}^2$   | $11511.7 (\nu: 15.0)$     |
| $H_0$                                | $68.06^{+0.97}_{-0.96}$         | $k_D$                       | $0.14051^{+0.00060}_{-0.00061}$ | $\chi_{6\text{DF}}^2$       | $0.030 (\nu: 0.0)$        |
| $\Omega_\Lambda$                     | $0.695^{+0.012}_{-0.013}$       | $100\theta_D$               | $0.16074^{+0.00038}_{-0.00038}$ | $\chi_{\text{MGS}}^2$       | $1.69 (\nu: 0.1)$         |
| $\Omega_m$                           | $0.305^{+0.013}_{-0.012}$       | $z_{\text{eq}}$             | $3362^{+47}_{-47}$              | $\chi_{\text{DR12BAO}}^2$   | $4.03 (\nu: 0.4)$         |
| $\Omega_m h^2$                       | $0.1413^{+0.0020}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01026^{+0.00014}_{-0.00014}$ | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.7)$          |
| $\Omega_m h^3$                       | $0.09620^{+0.00062}_{-0.00063}$ | $100\theta_{\text{eq}}$     | $0.8208^{+0.0091}_{-0.0091}$    | $\chi_{\text{BAO}}^2$       | $5.76 (\nu: 0.3)$         |
| $\sigma_8$                           | $0.838^{+0.039}_{-0.041}$       | $100\theta_{s,\text{eq}}$   | $0.4532^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | $11535.7 (\nu: 14.4)$     |
| $S_8$                                | $0.845^{+0.039}_{-0.040}$       | $H(0.15)$                   | $73.28^{+0.84}_{-0.83}$         |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11549.23; R - 1 = 0.01419$$



## 2.76 base\_CamSpecHM\_TTTEEE\_lowl\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02244^{+0.00037}_{-0.00034}$ | $S_8$                                 | $0.847^{+0.040}_{-0.038}$       | $100\theta_{\mathrm{s,eq}}$ | $0.4532^{+0.0067}_{-0.0065}$ |
| $\Omega_{\mathrm{c}} h^2$                | $0.1183^{+0.0030}_{-0.0030}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.464^{+0.022}_{-0.021}$       | $H(0.15)$                   | $73.3^{+1.2}_{-1.2}$         |
| $100\theta_{\mathrm{MC}}$                | $1.04102^{+0.00064}_{-0.00065}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.624^{+0.028}_{-0.025}$       | $D_{\mathrm{M}}(0.15)$      | $638^{+12}_{-12}$            |
| $\tau$                                   | $0.097^{+0.048}_{-0.049}$       | $\sigma_8/h^{0.5}$                    | $1.018^{+0.045}_{-0.041}$       | $H(0.38)$                   | $83.27^{+0.91}_{-0.86}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.122^{+0.093}_{-0.093}$       | $r_{\mathrm{drag}} h$                 | $100.3^{+2.4}_{-2.3}$           | $D_{\mathrm{M}}(0.38)$      | $1522^{+23}_{-24}$           |
| $n_{\mathrm{s}}$                         | $0.971^{+0.011}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$           | $2.51^{+0.11}_{-0.097}$         | $H(0.51)$                   | $89.93^{+0.73}_{-0.68}$      |
| $y_{\mathrm{cal}}$                       | $1.0002^{+0.0049}_{-0.0047}$    | $z_{\mathrm{re}}$                     | $11.4^{+3.8}_{-4.4}$            | $D_{\mathrm{M}}(0.51)$      | $1973^{+27}_{-28}$           |
| $A_{100}^{\mathrm{PS}}$                  | $233^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | $2.27^{+0.22}_{-0.21}$          | $H(0.61)$                   | $95.50^{+0.60}_{-0.55}$      |
| $A_{143}^{\mathrm{PS}}$                  | $36^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.872^{+0.024}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2296^{+29}_{-30}$           |
| $A_{217}^{\mathrm{PS}}$                  | $104^{+30}_{-30}$               | $D_{40}$                              | $1233^{+28}_{-26}$              | $H(2.33)$                   | $235.5^{+1.7}_{-1.8}$        |
| $A_{217}^{\mathrm{CIB}}$                 | $38^{+10}_{-10}$                | $D_{220}$                             | $5716^{+74}_{-73}$              | $D_{\mathrm{M}}(2.33)$      | $5755^{+25}_{-26}$           |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.54$                        | $D_{810}$                             | $2530^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.469^{+0.022}_{-0.020}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.68^{+0.26}_{-0.26}$          | $D_{1420}$                            | $815.5^{+9.4}_{-9.2}$           | $\sigma_8(0.15)$            | $0.776^{+0.035}_{-0.034}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $D_{2000}$                            | $231.3^{+3.4}_{-3.3}$           | $f\sigma_8(0.38)$           | $0.489^{+0.022}_{-0.020}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $n_{\mathrm{s},0.002}$                | $0.971^{+0.011}_{-0.010}$       | $\sigma_8(0.38)$            | $0.689^{+0.032}_{-0.031}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}$                      | $0.24542^{+0.00014}_{-0.00014}$ | $f\sigma_8(0.51)$           | $0.489^{+0.022}_{-0.020}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.38}_{-0.38}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24675^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | $0.645^{+0.030}_{-0.029}$    |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.34}_{-0.35}$          | $10^5 \mathrm{D}/\mathrm{H}$          | $2.574^{+0.064}_{-0.067}$       | $f\sigma_8(0.61)$           | $0.484^{+0.021}_{-0.020}$    |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.780^{+0.056}_{-0.058}$      | $\sigma_8(0.61)$            | $0.614^{+0.029}_{-0.028}$    |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.01^{+0.32}_{-0.32}$          | $z_*$                                 | $1089.69^{+0.62}_{-0.65}$       | $f\sigma_8(2.33)$           | $0.310^{+0.015}_{-0.015}$    |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                                 | $144.82^{+0.66}_{-0.64}$        | $\sigma_8(2.33)$            | $0.320^{+0.016}_{-0.015}$    |
| $c_{217}$                                | $1.0009^{+0.0032}_{-0.0031}$    | $100\theta_*$                         | $1.04120^{+0.00063}_{-0.00064}$ | $f_{2000}^{143}$            | $28^{+6}_{-6}$               |
| $c_{TE}$                                 | $0.994^{+0.010}_{-0.010}$       | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.909^{+0.061}_{-0.059}$      | $f_{2000}^{217}$            | $105.4^{+4.1}_{-4.1}$        |
| $c_{EE}$                                 | $0.9906^{+0.0097}_{-0.0097}$    | $z_{\mathrm{drag}}$                   | $1059.97^{+0.72}_{-0.69}$       | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $H_0$                                    | $68.0^{+1.4}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.47^{+0.64}_{-0.62}$        | $\chi_{\mathrm{lowl}}^2$    | $24.2 (\nu: 0.9)$            |
| $\Omega_{\Lambda}$                       | $0.694^{+0.018}_{-0.018}$       | $k_{\mathrm{D}}$                      | $0.14052^{+0.00066}_{-0.00068}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11512.0 (\nu: 15.5)$        |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.018}_{-0.018}$       | $100\theta_{\mathrm{D}}$              | $0.16074^{+0.00039}_{-0.00041}$ | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 5.6)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1414^{+0.0028}_{-0.0028}$    | $z_{\mathrm{eq}}$                     | $3363^{+66}_{-67}$              | $\chi_{\mathrm{CMB}}^2$     | $11536.2 (\nu: 15.4)$        |
| $\Omega_{\mathrm{m}} h^3$                | $0.09620^{+0.00063}_{-0.00063}$ | $k_{\mathrm{eq}}$                     | $0.01027^{+0.00020}_{-0.00020}$ |                             |                              |
| $\sigma_8$                               | $0.839^{+0.037}_{-0.036}$       | $100\theta_{\mathrm{eq}}$             | $0.821^{+0.013}_{-0.013}$       |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11543.93; R - 1 = 0.00900$$



## 2.77 base\_CamSpecHM\_TTTEEE\_lowl\_post\_BAO\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02244^{+0.00032}_{-0.00030}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.463^{+0.021}_{-0.020}$       | $D_{\mathrm{M}}(0.15)$      | $637.3^{+8.1}_{-8.1}$     |
| $\Omega_{\mathrm{c}}h^2$               | $0.1182^{+0.0021}_{-0.0021}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.624^{+0.027}_{-0.026}$       | $H(0.38)$                   | $83.29^{+0.62}_{-0.61}$   |
| $100\theta_{\mathrm{MC}}$              | $1.04104^{+0.00058}_{-0.00058}$ | $\sigma_8/h^{0.5}$                   | $1.017^{+0.044}_{-0.042}$       | $D_{\mathrm{M}}(0.38)$      | $1522^{+16}_{-16}$        |
| $\tau$                                 | $0.097^{+0.047}_{-0.045}$       | $r_{\mathrm{drag}}h$                 | $100.4^{+1.7}_{-1.6}$           | $H(0.51)$                   | $89.94^{+0.51}_{-0.49}$   |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.122^{+0.092}_{-0.087}$       | $\langle d^2 \rangle^{1/2}$          | $2.51^{+0.10}_{-0.10}$          | $D_{\mathrm{M}}(0.51)$      | $1972^{+19}_{-19}$        |
| $n_{\mathrm{s}}$                       | $0.9711^{+0.0086}_{-0.0084}$    | $z_{\mathrm{re}}$                    | $11.4^{+3.7}_{-4.0}$            | $H(0.61)$                   | $95.51^{+0.43}_{-0.41}$   |
| $y_{\mathrm{cal}}$                     | $1.0002^{+0.0049}_{-0.0047}$    | $10^9 A_{\mathrm{s}}$                | $2.27^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(0.61)$      | $2296^{+21}_{-21}$        |
| $A_{100}^{\mathrm{PS}}$                | $233^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.871^{+0.022}_{-0.021}$       | $H(2.33)$                   | $235.5^{+1.3}_{-1.2}$     |
| $A_{143}^{\mathrm{PS}}$                | $36^{+20}_{-20}$                | $D_{40}$                             | $1233^{+27}_{-26}$              | $D_{\mathrm{M}}(2.33)$      | $5755^{+20}_{-20}$        |
| $A_{217}^{\mathrm{PS}}$                | $105^{+30}_{-30}$               | $D_{220}$                            | $5717^{+74}_{-72}$              | $f\sigma_8(0.15)$           | $0.469^{+0.021}_{-0.020}$ |
| $A_{217}^{\mathrm{CIB}}$               | $38^{+10}_{-10}$                | $D_{810}$                            | $2530^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.776^{+0.033}_{-0.033}$ |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.60$                        | $D_{1420}$                           | $815.5^{+9.4}_{-9.1}$           | $f\sigma_8(0.38)$           | $0.489^{+0.021}_{-0.020}$ |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.67^{+0.25}_{-0.26}$          | $D_{2000}$                           | $231.3^{+3.3}_{-3.2}$           | $\sigma_8(0.38)$            | $0.689^{+0.030}_{-0.030}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $n_{\mathrm{s},0.002}$               | $0.9711^{+0.0086}_{-0.0084}$    | $f\sigma_8(0.51)$           | $0.489^{+0.021}_{-0.020}$ |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}$                     | $0.24542^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.645^{+0.028}_{-0.028}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24675^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.484^{+0.021}_{-0.020}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.00^{+0.37}_{-0.38}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.573^{+0.056}_{-0.056}$       | $\sigma_8(0.61)$            | $0.614^{+0.027}_{-0.027}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.95^{+0.34}_{-0.34}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.779^{+0.044}_{-0.046}$      | $f\sigma_8(2.33)$           | $0.310^{+0.014}_{-0.014}$ |
| $A_{217}^{\mathrm{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                                | $1089.68^{+0.49}_{-0.50}$       | $\sigma_8(2.33)$            | $0.320^{+0.014}_{-0.014}$ |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.01^{+0.31}_{-0.31}$          | $r_*$                                | $144.83^{+0.49}_{-0.48}$        | $f_{2000}^{143}$            | $28^{+6}_{-6}$            |
| $c_{100}$                              | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$                        | $1.04121^{+0.00057}_{-0.00057}$ | $f_{2000}^{217}$            | $105.5^{+4.0}_{-4.0}$     |
| $c_{217}$                              | $1.0009^{+0.0032}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.910^{+0.046}_{-0.046}$      | $f_{2000}^{143\times 217}$  | $30^{+4}_{-4}$            |
| $c_{TE}$                               | $0.994^{+0.010}_{-0.010}$       | $z_{\mathrm{drag}}$                  | $1059.98^{+0.68}_{-0.65}$       | $\chi_{\mathrm{lowl}}^2$    | $24.1\ (\nu: 0.9)$        |
| $c_{EE}$                               | $0.9906^{+0.0096}_{-0.0096}$    | $r_{\mathrm{drag}}$                  | $147.48^{+0.50}_{-0.49}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11511.5\ (\nu: 14.6)$    |
| $H_0$                                  | $68.08^{+0.97}_{-0.95}$         | $k_{\mathrm{D}}$                     | $0.14051^{+0.00060}_{-0.00061}$ | $\chi_{6\mathrm{DF}}^2$     | $0.030\ (\nu: 0.0)$       |
| $\Omega_{\Lambda}$                     | $0.695^{+0.012}_{-0.013}$       | $100\theta_{\mathrm{D}}$             | $0.16073^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{MGS}}^2$     | $1.71\ (\nu: 0.1)$        |
| $\Omega_{\mathrm{m}}$                  | $0.305^{+0.013}_{-0.012}$       | $z_{\mathrm{eq}}$                    | $3362^{+47}_{-47}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.01\ (\nu: 0.4)$        |
| $\Omega_{\mathrm{m}}h^2$               | $0.1413^{+0.0020}_{-0.0020}$    | $k_{\mathrm{eq}}$                    | $0.01026^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{prior}}^2$   | $7.7\ (\nu: 5.7)$         |
| $\Omega_{\mathrm{m}}h^3$               | $0.09621^{+0.00061}_{-0.00062}$ | $100\theta_{\mathrm{eq}}$            | $0.8209^{+0.0090}_{-0.0090}$    | $\chi_{\mathrm{BAO}}^2$     | $5.75\ (\nu: 0.3)$        |
| $\sigma_8$                             | $0.839^{+0.038}_{-0.035}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4533^{+0.0046}_{-0.0045}$    | $\chi_{\mathrm{CMB}}^2$     | $11535.6\ (\nu: 14.3)$    |
| $S_8$                                  | $0.846^{+0.038}_{-0.037}$       | $H(0.15)$                            | $73.29^{+0.84}_{-0.82}$         |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11549.09; R - 1 = 0.01512$$



## 2.78 base\_CamSpecHM\_TTTEE\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022266 | $0.02227^{+0.00032}_{-0.00031}$ | $S_8$                       | 0.8311   | $0.831^{+0.033}_{-0.032}$       | $100\theta_{s,eq}$          | 0.4495   | $0.4495^{+0.0060}_{-0.0059}$ |
| $\Omega_c h^2$              | 0.12002  | $0.1200^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4552   | $0.455^{+0.018}_{-0.018}$       | $H(0.15)$                   | 72.56    | $72.6^{+1.0}_{-1.0}$         |
| $100\theta_{MC}$            | 1.04083  | $1.04084^{+0.00063}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6070   | $0.607^{+0.017}_{-0.016}$       | $D_M(0.15)$                 | 644.5    | $644^{+10}_{-10}$            |
| $\tau$                      | 0.0527   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9872   | $0.987^{+0.024}_{-0.023}$       | $H(0.38)$                   | 82.75    | $82.76^{+0.76}_{-0.74}$      |
| $\ln(10^{10} A_s)$          | 3.0397   | $3.040^{+0.032}_{-0.031}$       | $r_{drag} h$                | 98.96    | $99.0^{+2.1}_{-2.1}$            | $D_M(0.38)$                 | 1536.0   | $1536^{+21}_{-21}$           |
| $n_s$                       | 0.9640   | $0.9639^{+0.0089}_{-0.0089}$    | $\langle d^2 \rangle^{1/2}$ | 2.443    | $2.443^{+0.057}_{-0.056}$       | $H(0.51)$                   | 89.52    | $89.53^{+0.60}_{-0.58}$      |
| $y_{cal}$                   | 1.00037  | $1.0005^{+0.0050}_{-0.0049}$    | $z_{re}$                    | 7.54     | $7.5^{+1.5}_{-1.6}$             | $D_M(0.51)$                 | 1989.0   | $1989^{+24}_{-24}$           |
| $A_{100}^{PS}$              | 238.7    | $242^{+50}_{-50}$               | $10^9 A_s$                  | 2.090    | $2.090^{+0.067}_{-0.064}$       | $H(0.61)$                   | 95.173   | $95.18^{+0.49}_{-0.47}$      |
| $A_{143}^{PS}$              | 43.9     | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8808   | $1.881^{+0.023}_{-0.023}$       | $D_M(0.61)$                 | 2313.8   | $2314^{+26}_{-26}$           |
| $A_{217}^{PS}$              | 101.4    | $102^{+30}_{-30}$               | $D_{40}$                    | 1230.7   | $1231^{+26}_{-26}$              | $H(2.33)$                   | 236.46   | $236.5^{+1.7}_{-1.6}$        |
| $A_{217}^{CIB}$             | 43.3     | $40^{+10}_{-10}$                | $D_{220}$                   | 5723     | $5724^{+76}_{-76}$              | $D_M(2.33)$                 | 5769.4   | $5769^{+22}_{-22}$           |
| $A_{143}^{tSZ}$             | 5.45     | $< 7.41$                        | $D_{810}$                   | 2535.1   | $2535^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4594   | $0.459^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{PS}$   | 0.637    | $0.65^{+0.25}_{-0.25}$          | $D_{1420}$                  | 815.0    | $815.0^{+9.6}_{-9.3}$           | $\sigma_8(0.15)$            | 0.7475   | $0.747^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $D_{2000}$                  | 229.94   | $229.9^{+3.3}_{-3.1}$           | $f\sigma_8(0.38)$           | 0.4766   | $0.477^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | 0.39     | —                               | $n_{s,0.002}$               | 0.9640   | $0.9639^{+0.0089}_{-0.0089}$    | $\sigma_8(0.38)$            | 0.6621   | $0.662^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | 1.9      | —                               | $Y_P$                       | 0.245353 | $0.24535^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | 0.4747   | $0.475^{+0.012}_{-0.012}$    |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246680 | $0.24668^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.6194   | $0.619^{+0.010}_{-0.010}$    |
| $A_{143}^{dust}$            | 0.977    | $0.96^{+0.35}_{-0.34}$          | $10^5 D/H$                  | 2.605    | $2.606^{+0.059}_{-0.058}$       | $f\sigma_8(0.61)$           | 0.4693   | $0.469^{+0.011}_{-0.011}$    |
| $A_{217}^{dust}$            | 0.968    | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | 13.8109  | $13.810^{+0.049}_{-0.050}$      | $\sigma_8(0.61)$            | 0.5892   | $0.5892^{+0.0096}_{-0.0094}$ |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.32}$          | $z_*$                       | 1090.05  | $1090.05^{+0.56}_{-0.55}$       | $f\sigma_8(2.33)$           | 0.29691  | $0.2969^{+0.0049}_{-0.0047}$ |
| $c_{100}$                   | 0.99769  | $0.9976^{+0.0021}_{-0.0021}$    | $r_*$                       | 144.51   | $144.51^{+0.62}_{-0.61}$        | $\sigma_8(2.33)$            | 0.3059   | $0.3059^{+0.0051}_{-0.0050}$ |
| $c_{217}$                   | 1.00131  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | 1.04102  | $1.04103^{+0.00062}_{-0.00061}$ | $f_{2000}^{143}$            | 30.7     | $30^{+6}_{-6}$               |
| $c_{TE}$                    | 0.9966   | $0.9966^{+0.0098}_{-0.0095}$    | $D_M(z_*)/\text{Gpc}$       | 13.881   | $13.881^{+0.058}_{-0.057}$      | $f_{2000}^{217}$            | 107.15   | $107.2^{+3.8}_{-3.7}$        |
| $c_{EE}$                    | 0.9925   | $0.9924^{+0.0098}_{-0.0096}$    | $z_{drag}$                  | 1059.70  | $1059.70^{+0.66}_{-0.64}$       | $f_{2000}^{143 \times 217}$ | 32.59    | $33^{+4}_{-4}$               |
| $H_0$                       | 67.23    | $67.2^{+1.2}_{-1.2}$            | $r_{drag}$                  | 147.20   | $147.21^{+0.63}_{-0.61}$        | $\chi_{small}^2$            | 395.86   | $396.9 (\nu: 1.4)$           |
| $\Omega_\Lambda$            | 0.6838   | $0.684^{+0.017}_{-0.017}$       | $k_D$                       | 0.14067  | $0.14067^{+0.00069}_{-0.00069}$ | $\chi_{CamSpec}^2$          | 11499.5  | $11514.4 (\nu: 15.7)$        |
| $\Omega_m$                  | 0.3162   | $0.316^{+0.017}_{-0.017}$       | $100\theta_D$               | 0.160888 | $0.16089^{+0.00038}_{-0.00038}$ | $\chi_{prior}^2$            | 2.1      | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^2$              | 0.14293  | $0.1429^{+0.0026}_{-0.0026}$    | $z_{eq}$                    | 3400     | $3400^{+62}_{-62}$              | $\chi_{CMB}^2$              | 11895.4  | $11911.3 (\nu: 16.5)$        |
| $\Omega_m h^3$              | 0.09609  | $0.09609^{+0.00065}_{-0.00062}$ | $k_{eq}$                    | 0.010378 | $0.01038^{+0.00019}_{-0.00019}$ |                             |          |                              |
| $\sigma_8$                  | 0.8094   | $0.809^{+0.015}_{-0.015}$       | $100\theta_{eq}$            | 0.8133   | $0.813^{+0.012}_{-0.011}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11897.49$ ;  $\bar{\chi}_{eff}^2 = 11919.09$ ;  $R - 1 = 0.00575$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.86 CamSpec like\_10.7HM\_1400\_unified: 11499.49



### 3 Alens

#### 3.1 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02270  | $0.02263^{+0.00056}_{-0.00058}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4286   | $0.430^{+0.033}_{-0.031}$       | $H(0.15)$                   | 74.25    | $74.1^{+2.1}_{-2.1}$         |
| $\Omega_c h^2$              | 0.11620  | $0.1164^{+0.0050}_{-0.0048}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.5833   | $0.584^{+0.030}_{-0.029}$       | $D_M(0.15)$                 | 628.1    | $629^{+20}_{-19}$            |
| $100\theta_{MC}$            | 1.04149  | $1.0414^{+0.0010}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9543   | $0.956^{+0.041}_{-0.040}$       | $H(0.38)$                   | 84.02    | $83.9^{+1.6}_{-1.5}$         |
| $\tau$                      | 0.0502   | $0.050^{+0.017}_{-0.017}$       | $r_{drag} h$                | 102.20   | $102.0^{+4.1}_{-4.1}$           | $D_M(0.38)$                 | 1502.7   | $1505^{+41}_{-40}$           |
| $A_L$                       | 1.270    | $1.25^{+0.20}_{-0.19}$          | $\langle d^2 \rangle^{1/2}$ | 2.656    | $2.64^{+0.15}_{-0.16}$          | $H(0.51)$                   | 90.53    | $90.5^{+1.3}_{-1.2}$         |
| $\ln(10^{10} A_s)$          | 3.0260   | $3.026^{+0.033}_{-0.037}$       | $z_{re}$                    | 7.14     | $7.1^{+1.7}_{-1.8}$             | $D_M(0.51)$                 | 1949.8   | $1953^{+48}_{-47}$           |
| $n_s$                       | 0.9776   | $0.976^{+0.014}_{-0.014}$       | $10^9 A_s$                  | 2.061    | $2.062^{+0.069}_{-0.075}$       | $H(0.61)$                   | 96.00    | $95.9^{+1.1}_{-0.99}$        |
| $y_{cal}$                   | 0.99990  | $1.0001^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8643   | $1.864^{+0.029}_{-0.028}$       | $D_M(0.61)$                 | 2271     | $2275^{+51}_{-51}$           |
| $A_{100}^{PS}$              | 217.0    | $229^{+50}_{-50}$               | $D_{40}$                    | 1200.1   | $1204^{+35}_{-33}$              | $H(2.33)$                   | 234.44   | $234.5^{+2.9}_{-2.8}$        |
| $A_{143}^{PS}$              | 44.2     | $33^{+20}_{-20}$                | $D_{220}$                   | 5727     | $5728^{+84}_{-84}$              | $D_M(2.33)$                 | 5732.6   | $5737^{+44}_{-45}$           |
| $A_{217}^{PS}$              | 109.9    | $104^{+30}_{-30}$               | $D_{810}$                   | 2526.2   | $2525^{+28}_{-27}$              | $f\sigma_8(0.15)$           | 0.4346   | $0.436^{+0.030}_{-0.029}$    |
| $A_{217}^{CIB}$             | 36.7     | $37^{+10}_{-10}$                | $D_{1420}$                  | 815.6    | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.7354   | $0.735^{+0.018}_{-0.019}$    |
| $A_{143}^{tSZ}$             | 6.24     | $4.2^{+3.6}_{-4.1}$             | $D_{2000}$                  | 233.18   | $232.3^{+4.1}_{-4.2}$           | $f\sigma_8(0.38)$           | 0.4569   | $0.458^{+0.024}_{-0.024}$    |
| $r_{143 \times 217}^{PS}$   | 0.796    | $0.68^{+0.28}_{-0.25}$          | $n_{s,0.002}$               | 0.9776   | $0.976^{+0.014}_{-0.014}$       | $\sigma_8(0.38)$            | 0.6541   | $0.654^{+0.014}_{-0.015}$    |
| $r_{143 \times 217}^{CIB}$  | 0.74     | —                               | $Y_P$                       | 0.245516 | $0.24549^{+0.00025}_{-0.00023}$ | $f\sigma_8(0.51)$           | 0.4579   | $0.458^{+0.021}_{-0.021}$    |
| $\xi^{tSZ \times CIB}$      | 0.996    | —                               | $Y_P^{BBN}$                 | 0.246843 | $0.24682^{+0.00025}_{-0.00023}$ | $\sigma_8(0.51)$            | 0.6130   | $0.613^{+0.012}_{-0.013}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $10^5 D/H$                  | 2.527    | $2.54^{+0.11}_{-0.10}$          | $f\sigma_8(0.61)$           | 0.4546   | $0.455^{+0.019}_{-0.019}$    |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.730   | $13.740^{+0.098}_{-0.099}$      | $\sigma_8(0.61)$            | 0.5839   | $0.584^{+0.011}_{-0.012}$    |
| $A_{143}^{dust}$            | 0.948    | $0.95^{+0.35}_{-0.34}$          | $z_*$                       | 1089.18  | $1089.3^{+1.1}_{-1.0}$          | $f\sigma_8(2.33)$           | 0.2952   | $0.2950^{+0.0052}_{-0.0057}$ |
| $A_{217}^{dust}$            | 0.990    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 145.17   | $145.2^{+1.0}_{-1.0}$           | $\sigma_8(2.33)$            | 0.3053   | $0.3050^{+0.0053}_{-0.0057}$ |
| $A_{143 \times 217}^{dust}$ | 1.016    | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04165  | $1.0416^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$            | 25.2     | $26^{+7}_{-7}$               |
| $c_{100}$                   | 0.99788  | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 13.936   | $13.938^{+0.093}_{-0.093}$      | $f_{2000}^{217}$            | 103.32   | $104.3^{+4.6}_{-4.7}$        |
| $c_{217}$                   | 1.00076  | $1.0008^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | 1060.43  | $1060.3^{+1.1}_{-1.1}$          | $f_{2000}^{143 \times 217}$ | 28.5     | $29^{+5}_{-5}$               |
| $H_0$                       | 69.18    | $69.0^{+2.4}_{-2.4}$            | $r_{drag}$                  | 147.74   | $147.77^{+0.97}_{-0.98}$        | $\chi_{simall}^2$           | 395.71   | $396.8 (\nu: 1.2)$           |
| $\Omega_\Lambda$            | 0.7084   | $0.707^{+0.028}_{-0.031}$       | $k_D$                       | 0.14043  | $0.14034^{+0.00099}_{-0.0010}$  | $\chi_{lowl}^2$             | 21.18    | $21.6 (\nu: 0.5)$            |
| $\Omega_m$                  | 0.2916   | $0.293^{+0.031}_{-0.028}$       | $100\theta_D$               | 0.16052  | $0.16061^{+0.00061}_{-0.00057}$ | $\chi_{CamSpec}^2$          | 7046.0   | $7059.9 (\nu: 14.2)$         |
| $\Omega_m h^2$              | 0.13955  | $0.1397^{+0.0046}_{-0.0044}$    | $z_{eq}$                    | 3319     | $3322^{+110}_{-110}$            | $\chi_{prior}^2$            | 1.4      | $7.2 (\nu: 5.4)$             |
| $\Omega_m h^3$              | 0.09654  | $0.09640^{+0.00098}_{-0.0010}$  | $k_{eq}$                    | 0.010131 | $0.01014^{+0.00034}_{-0.00032}$ | $\chi_{CMB}^2$              | 7462.8   | $7478.3 (\nu: 15.1)$         |
| $\sigma_8$                  | 0.7937   | $0.794^{+0.021}_{-0.022}$       | $100\theta_{eq}$            | 0.8298   | $0.829^{+0.022}_{-0.022}$       |                             |          |                              |
| $S_8$                       | 0.783    | $0.785^{+0.060}_{-0.056}$       | $100\theta_{s,eq}$          | 0.4578   | $0.457^{+0.011}_{-0.011}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7464.21$ ;  $\Delta\chi_{eff}^2 = -7.53$ ;  $\bar{\chi}_{eff}^2 = 7485.53$ ;  $\Delta\bar{\chi}_{eff}^2 = -6.01$ ;  $R - 1 = 0.00653$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.71 ( $\Delta$  -0.12) commander\_dx12.v3.2.29: 21.18 ( $\Delta$  -2.22) CamSpec like\_10.7HM: 7045.95 ( $\Delta$  -4.38)



### 3.2 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02250^{+0.00043}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.017}_{-0.017}$       | $H(0.38)$                   | $83.47^{+0.80}_{-0.80}$      |
| $\Omega_c h^2$              | $0.1178^{+0.0026}_{-0.0025}$    | $\sigma_8/h^{0.5}$          | $0.966^{+0.024}_{-0.025}$       | $D_M(0.38)$                 | $1517^{+21}_{-20}$           |
| $100\theta_{MC}$            | $1.04124^{+0.00084}_{-0.00087}$ | $r_{drag}h$                 | $100.8^{+2.0}_{-2.0}$           | $H(0.51)$                   | $90.10^{+0.67}_{-0.66}$      |
| $\tau$                      | $0.050^{+0.016}_{-0.018}$       | $\langle d^2 \rangle^{1/2}$ | $2.62^{+0.15}_{-0.15}$          | $D_M(0.51)$                 | $1966^{+24}_{-24}$           |
| $A_L$                       | $1.21^{+0.16}_{-0.15}$          | $z_{re}$                    | $7.1^{+1.7}_{-1.9}$             | $H(0.61)$                   | $95.64^{+0.57}_{-0.57}$      |
| $\ln(10^{10} A_s)$          | $3.028^{+0.033}_{-0.038}$       | $10^9 A_s$                  | $2.065^{+0.069}_{-0.077}$       | $D_M(0.61)$                 | $2289^{+27}_{-26}$           |
| $n_s$                       | $0.9719^{+0.0092}_{-0.0091}$    | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.6}$        |
| $y_{cal}$                   | $1.0001^{+0.0052}_{-0.0050}$    | $D_{40}$                    | $1212^{+26}_{-26}$              | $D_M(2.33)$                 | $5749^{+28}_{-28}$           |
| $A_{100}^{PS}$              | $230^{+50}_{-50}$               | $D_{220}$                   | $5720^{+82}_{-84}$              | $f\sigma_8(0.15)$           | $0.444^{+0.016}_{-0.017}$    |
| $A_{143}^{PS}$              | $35^{+20}_{-20}$                | $D_{810}$                   | $2526^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.739^{+0.014}_{-0.015}$    |
| $A_{217}^{PS}$              | $104^{+30}_{-30}$               | $D_{1420}$                  | $814^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.464^{+0.014}_{-0.014}$    |
| $A_{217}^{CIB}$             | $37^{+10}_{-10}$                | $D_{2000}$                  | $231.8^{+3.7}_{-3.8}$           | $\sigma_8(0.38)$            | $0.656^{+0.012}_{-0.013}$    |
| $A_{143}^{tSZ}$             | $4.1^{+3.5}_{-4.0}$             | $n_{s,0.002}$               | $0.9719^{+0.0092}_{-0.0091}$    | $f\sigma_8(0.51)$           | $0.464^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | $0.68^{+0.26}_{-0.26}$          | $Y_P$                       | $0.24544^{+0.00017}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.615^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24677^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.460^{+0.011}_{-0.012}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.563^{+0.083}_{-0.078}$       | $\sigma_8(0.61)$            | $0.585^{+0.010}_{-0.012}$    |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.765^{+0.065}_{-0.063}$      | $f\sigma_8(2.33)$           | $0.2954^{+0.0050}_{-0.0057}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1089.57^{+0.66}_{-0.64}$       | $\sigma_8(2.33)$            | $0.3050^{+0.0053}_{-0.0059}$ |
| $A_{143}^{dust}$            | $0.96^{+0.35}_{-0.35}$          | $r_*$                       | $144.90^{+0.63}_{-0.60}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04141^{+0.00082}_{-0.00085}$ | $f_{2000}^{217}$            | $104.8^{+4.3}_{-4.3}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.31}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.914^{+0.062}_{-0.059}$      | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$               |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $z_{drag}$                  | $1060.08^{+0.92}_{-0.98}$       | $\chi_{simall}^2$           | $396.9 (\nu: 1.3)$           |
| $c_{217}$                   | $1.0008^{+0.0032}_{-0.0031}$    | $r_{drag}$                  | $147.53^{+0.68}_{-0.65}$        | $\chi_{lowl}^2$             | $22.00 (\nu: 0.3)$           |
| $H_0$                       | $68.4^{+1.2}_{-1.2}$            | $k_D$                       | $0.14050^{+0.00083}_{-0.00088}$ | $\chi_{CamSpec}^2$          | $7058.9 (\nu: 13.4)$         |
| $\Omega_\Lambda$            | $0.698^{+0.015}_{-0.016}$       | $100\theta_D$               | $0.16070^{+0.00056}_{-0.00052}$ | $\chi_{6DF}^2$              | $0.049 (\nu: 0.0)$           |
| $\Omega_m$                  | $0.302^{+0.016}_{-0.015}$       | $z_{eq}$                    | $3353^{+58}_{-57}$              | $\chi_{MGS}^2$              | $1.99 (\nu: 0.2)$            |
| $\Omega_m h^2$              | $0.1409^{+0.0024}_{-0.0024}$    | $k_{eq}$                    | $0.01023^{+0.00018}_{-0.00017}$ | $\chi_{DR12BAO}^2$          | $4.06 (\nu: 0.5)$            |
| $\Omega_m h^3$              | $0.09633^{+0.00095}_{-0.00099}$ | $100\theta_{eq}$            | $0.823^{+0.011}_{-0.011}$       | $\chi_{prior}^2$            | $7.3 (\nu: 5.6)$             |
| $\sigma_8$                  | $0.799^{+0.016}_{-0.017}$       | $100\theta_{s,eq}$          | $0.4543^{+0.0056}_{-0.0057}$    | $\chi_{BAO}^2$              | $6.1 (\nu: 0.8)$             |
| $S_8$                       | $0.801^{+0.032}_{-0.032}$       | $H(0.15)$                   | $73.5^{+1.0}_{-1.0}$            | $\chi_{CMB}^2$              | $7477.8 (\nu: 14.8)$         |
| $\sigma_8 \Omega_m^{0.5}$   | $0.439^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | $635^{+10}_{-9.9}$              |                             |                              |

$$\bar{\chi}_{eff}^2 = 7491.23; \Delta \bar{\chi}_{eff}^2 = -6.32; R - 1 = 0.01433$$



### 3.3 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE\_post\_Riess18

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02293^{+0.00050}_{-0.00050}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.411^{+0.025}_{-0.023}$       | $H(0.15)$                   | $75.5^{+1.6}_{-1.7}$         |
| $\Omega_c h^2$                       | $0.1133^{+0.0040}_{-0.0037}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.567^{+0.024}_{-0.022}$       | $D_M(0.15)$                 | $617^{+16}_{-14}$            |
| $100\theta_{MC}$                     | $1.04192^{+0.00098}_{-0.00095}$ | $\sigma_8/h^{0.5}$          | $0.932^{+0.034}_{-0.032}$       | $H(0.38)$                   | $84.9^{+1.3}_{-1.3}$         |
| $\tau$                               | $0.052^{+0.017}_{-0.017}$       | $r_{\text{drag}} h$         | $104.7^{+3.2}_{-3.3}$           | $D_M(0.38)$                 | $1480^{+32}_{-30}$           |
| $A_L$                                | $1.33^{+0.20}_{-0.18}$          | $\langle d^2 \rangle^{1/2}$ | $2.67^{+0.15}_{-0.15}$          | $H(0.51)$                   | $91.3^{+1.0}_{-1.0}$         |
| $\ln(10^{10} A_s)$                   | $3.023^{+0.034}_{-0.034}$       | $z_{\text{re}}$             | $7.2^{+1.7}_{-1.7}$             | $D_M(0.51)$                 | $1922^{+38}_{-36}$           |
| $n_s$                                | $0.984^{+0.011}_{-0.012}$       | $10^9 A_s$                  | $2.056^{+0.071}_{-0.069}$       | $H(0.61)$                   | $96.60^{+0.84}_{-0.86}$      |
| $y_{\text{cal}}$                     | $1.0001^{+0.0046}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.852^{+0.026}_{-0.025}$       | $D_M(0.61)$                 | $2242^{+41}_{-39}$           |
| $A_{100}^{\text{PS}}$                | $225^{+50}_{-50}$               | $D_{40}$                    | $1188^{+31}_{-27}$              | $H(2.33)$                   | $232.8^{+2.3}_{-2.1}$        |
| $A_{143}^{\text{PS}}$                | $30^{+20}_{-20}$                | $D_{220}$                   | $5746^{+84}_{-80}$              | $D_M(2.33)$                 | $5709^{+38}_{-38}$           |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $D_{810}$                   | $2521^{+27}_{-28}$              | $f\sigma_8(0.15)$           | $0.418^{+0.024}_{-0.022}$    |
| $A_{217}^{\text{CIB}}$               | $35^{+10}_{-10}$                | $D_{1420}$                  | $815.5^{+9.8}_{-10}$            | $\sigma_8(0.15)$            | $0.727^{+0.016}_{-0.016}$    |
| $A_{143}^{\text{tSZ}}$               | $4.4^{+3.6}_{-4.2}$             | $D_{2000}$                  | $233.8^{+3.8}_{-3.9}$           | $f\sigma_8(0.38)$           | $0.443^{+0.020}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.69^{+0.28}_{-0.25}$          | $n_{s,0.002}$               | $0.984^{+0.011}_{-0.012}$       | $\sigma_8(0.38)$            | $0.649^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24562^{+0.00022}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.446^{+0.018}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24695^{+0.00022}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.609^{+0.012}_{-0.012}$    |
| $A^{\text{kSZ}}$                     | $< 8.44$                        | $10^5 \text{D}/\text{H}$    | $2.486^{+0.089}_{-0.086}$       | $f\sigma_8(0.61)$           | $0.444^{+0.016}_{-0.015}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.680^{+0.083}_{-0.080}$      | $\sigma_8(0.61)$            | $0.581^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.34}$          | $z_*$                       | $1088.65^{+0.86}_{-0.80}$       | $f\sigma_8(2.33)$           | $0.2943^{+0.0054}_{-0.0051}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $145.76^{+0.83}_{-0.88}$        | $\sigma_8(2.33)$            | $0.3052^{+0.0054}_{-0.0053}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.34}_{-0.32}$          | $100\theta_*$               | $1.04206^{+0.00095}_{-0.00093}$ | $f_{2000}^{143}$            | $24^{+6}_{-6}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.987^{+0.079}_{-0.081}$      | $f_{2000}^{217}$            | $102.9^{+4.4}_{-4.4}$        |
| $c_{217}$                            | $1.0006^{+0.0030}_{-0.0030}$    | $z_{\text{drag}}$           | $1060.7^{+1.0}_{-1.0}$          | $f_{2000}^{143 \times 217}$ | $28^{+5}_{-5}$               |
| $H_0$                                | $70.6^{+1.8}_{-1.9}$            | $r_{\text{drag}}$           | $148.26^{+0.87}_{-0.86}$        | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.2)$           |
| $\Omega_\Lambda$                     | $0.725^{+0.020}_{-0.023}$       | $k_D$                       | $0.14004^{+0.00094}_{-0.00098}$ | $\chi_{\text{lowl}}^2$      | $20.64 (\nu: 0.2)$           |
| $\Omega_m$                           | $0.275^{+0.023}_{-0.020}$       | $100\theta_D$               | $0.16039^{+0.00054}_{-0.00052}$ | $\chi_{\text{CamSpec}}^2$   | $7062.5 (\nu: 16.4)$         |
| $\Omega_m h^2$                       | $0.1369^{+0.0037}_{-0.0034}$    | $z_{\text{eq}}$             | $3256^{+89}_{-82}$              | $\chi_{\text{H073p45}}^2$   | $3.3 (\nu: 2.2)$             |
| $\Omega_m h^3$                       | $0.09662^{+0.00096}_{-0.00094}$ | $k_{\text{eq}}$             | $0.00994^{+0.00027}_{-0.00025}$ | $\chi_{\text{prior}}^2$     | $6.9 (\nu: 4.7)$             |
| $\sigma_8$                           | $0.783^{+0.019}_{-0.019}$       | $100\theta_{\text{eq}}$     | $0.843^{+0.017}_{-0.018}$       | $\chi_{\text{CMB}}^2$       | $7479.9 (\nu: 16.9)$         |
| $S_8$                                | $0.750^{+0.046}_{-0.043}$       | $100\theta_{s,\text{eq}}$   | $0.4645^{+0.0087}_{-0.0091}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7490.17; \Delta \bar{\chi}_{\text{eff}}^2 = -12.71; R - 1 = 0.03353$$



### 3.4 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02263^{+0.00056}_{-0.00058}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.431^{+0.033}_{-0.031}$       | $H(0.15)$                   | $74.1^{+2.1}_{-2.1}$         |
| $\Omega_{\text{c}} h^2$              | $0.1164^{+0.0050}_{-0.0048}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.586^{+0.029}_{-0.028}$       | $D_{\text{M}}(0.15)$        | $629^{+20}_{-19}$            |
| $100\theta_{\text{MC}}$              | $1.0414^{+0.0010}_{-0.0011}$    | $\sigma_8/h^{0.5}$                  | $0.958^{+0.040}_{-0.039}$       | $H(0.38)$                   | $83.9^{+1.6}_{-1.5}$         |
| $\tau$                               | $0.053^{+0.012}_{-0.010}$       | $r_{\text{drag}} h$                 | $102.1^{+4.0}_{-4.1}$           | $D_{\text{M}}(0.38)$        | $1505^{+41}_{-39}$           |
| $A_{\text{L}}$                       | $1.24^{+0.20}_{-0.18}$          | $\langle d^2 \rangle^{1/2}$         | $2.64^{+0.15}_{-0.16}$          | $H(0.51)$                   | $90.5^{+1.3}_{-1.2}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.032^{+0.027}_{-0.025}$       | $z_{\text{re}}$                     | $< 8.55$                        | $D_{\text{M}}(0.51)$        | $1953^{+48}_{-47}$           |
| $n_{\text{s}}$                       | $0.976^{+0.014}_{-0.014}$       | $10^9 A_{\text{s}}$                 | $2.075^{+0.056}_{-0.051}$       | $H(0.61)$                   | $95.9^{+1.1}_{-0.99}$        |
| $y_{\text{cal}}$                     | $1.0001^{+0.0049}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.864^{+0.029}_{-0.028}$       | $D_{\text{M}}(0.61)$        | $2274^{+52}_{-51}$           |
| $A_{100}^{\text{PS}}$                | $228^{+50}_{-50}$               | $D_{40}$                            | $1205^{+34}_{-33}$              | $H(2.33)$                   | $234.5^{+2.9}_{-2.7}$        |
| $A_{143}^{\text{PS}}$                | $33^{+20}_{-20}$                | $D_{220}$                           | $5727^{+84}_{-85}$              | $D_{\text{M}}(2.33)$        | $5736^{+44}_{-45}$           |
| $A_{217}^{\text{PS}}$                | $104^{+30}_{-30}$               | $D_{810}$                           | $2525^{+28}_{-27}$              | $f\sigma_8(0.15)$           | $0.437^{+0.031}_{-0.029}$    |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{1420}$                          | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.738^{+0.016}_{-0.016}$    |
| $A_{143}^{\text{tSZ}}$               | $4.2^{+3.6}_{-4.1}$             | $D_{2000}$                          | $232.4^{+4.1}_{-4.3}$           | $f\sigma_8(0.38)$           | $0.459^{+0.024}_{-0.024}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.28}_{-0.25}$          | $n_{\text{s},0.002}$                | $0.976^{+0.014}_{-0.014}$       | $\sigma_8(0.38)$            | $0.656^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.24549^{+0.00025}_{-0.00023}$ | $f\sigma_8(0.51)$           | $0.460^{+0.021}_{-0.020}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24682^{+0.00025}_{-0.00023}$ | $\sigma_8(0.51)$            | $0.615^{+0.011}_{-0.0099}$   |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.54^{+0.11}_{-0.10}$          | $f\sigma_8(0.61)$           | $0.456^{+0.018}_{-0.018}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$             | $13.739^{+0.098}_{-0.098}$      | $\sigma_8(0.61)$            | $0.5854^{+0.0097}_{-0.0089}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.34}$          | $z_*$                               | $1089.3^{+1.1}_{-1.0}$          | $f\sigma_8(2.33)$           | $0.2959^{+0.0043}_{-0.0040}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $145.2^{+1.0}_{-1.0}$           | $\sigma_8(2.33)$            | $0.3060^{+0.0043}_{-0.0039}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$                       | $1.0416^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$            | $26^{+7}_{-7}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.939^{+0.092}_{-0.093}$      | $f_{2000}^{217}$            | $104.3^{+4.6}_{-4.7}$        |
| $c_{217}$                            | $1.0008^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1060.3^{+1.1}_{-1.1}$          | $f_{2000}^{143 \times 217}$ | $29^{+5}_{-5}$               |
| $H_0$                                | $69.1^{+2.4}_{-2.4}$            | $r_{\text{drag}}$                   | $147.78^{+0.97}_{-0.98}$        | $\chi_{\text{simall}}^2$    | $396.4 (\nu: 0.6)$           |
| $\Omega_{\Lambda}$                   | $0.707^{+0.028}_{-0.031}$       | $k_{\text{D}}$                      | $0.14033^{+0.00098}_{-0.0010}$  | $\chi_{\text{lowl}}^2$      | $21.6 (\nu: 0.6)$            |
| $\Omega_{\text{m}}$                  | $0.293^{+0.031}_{-0.028}$       | $100\theta_{\text{D}}$              | $0.16061^{+0.00061}_{-0.00056}$ | $\chi_{\text{CamSpec}}^2$   | $7059.9 (\nu: 14.3)$         |
| $\Omega_{\text{m}} h^2$              | $0.1396^{+0.0047}_{-0.0044}$    | $z_{\text{eq}}$                     | $3321^{+110}_{-110}$            | $\chi_{\text{prior}}^2$     | $7.2 (\nu: 5.4)$             |
| $\Omega_{\text{m}} h^3$              | $0.09640^{+0.00097}_{-0.00099}$ | $k_{\text{eq}}$                     | $0.01014^{+0.00034}_{-0.00032}$ | $\chi_{\text{CMB}}^2$       | $7477.9 (\nu: 14.6)$         |
| $\sigma_8$                           | $0.796^{+0.020}_{-0.020}$       | $100\theta_{\text{eq}}$             | $0.829^{+0.022}_{-0.022}$       |                             |                              |
| $S_8$                                | $0.787^{+0.060}_{-0.056}$       | $100\theta_{\text{s,eq}}$           | $0.458^{+0.011}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7485.10; \Delta \bar{\chi}_{\text{eff}}^2 = -6.16; R - 1 = 0.00928$$



### 3.5 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02250^{+0.00043}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.594^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.48^{+0.80}_{-0.80}$      |
| $\Omega_c h^2$              | $0.1178^{+0.0026}_{-0.0025}$    | $\sigma_8/h^{0.5}$          | $0.969^{+0.022}_{-0.022}$       | $D_M(0.38)$                 | $1517^{+21}_{-20}$           |
| $100\theta_{MC}$            | $1.04123^{+0.00084}_{-0.00087}$ | $r_{drag}h$                 | $100.8^{+2.0}_{-2.0}$           | $H(0.51)$                   | $90.10^{+0.66}_{-0.66}$      |
| $\tau$                      | $0.0528^{+0.011}_{-0.0096}$     | $\langle d^2 \rangle^{1/2}$ | $2.62^{+0.15}_{-0.15}$          | $D_M(0.51)$                 | $1966^{+24}_{-24}$           |
| $A_L$                       | $1.20^{+0.15}_{-0.15}$          | $z_{re}$                    | $< 8.49$                        | $H(0.61)$                   | $95.64^{+0.57}_{-0.58}$      |
| $\ln(10^{10} A_s)$          | $3.034^{+0.026}_{-0.024}$       | $10^9 A_s$                  | $2.078^{+0.055}_{-0.050}$       | $D_M(0.61)$                 | $2289^{+27}_{-26}$           |
| $n_s$                       | $0.9721^{+0.0093}_{-0.0091}$    | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.6}$        |
| $y_{cal}$                   | $1.0001^{+0.0052}_{-0.0051}$    | $D_{40}$                    | $1212^{+25}_{-26}$              | $D_M(2.33)$                 | $5749^{+29}_{-27}$           |
| $A_{100}^{PS}$              | $230^{+50}_{-50}$               | $D_{220}$                   | $5719^{+83}_{-86}$              | $f\sigma_8(0.15)$           | $0.446^{+0.016}_{-0.016}$    |
| $A_{143}^{PS}$              | $35^{+20}_{-20}$                | $D_{810}$                   | $2526^{+28}_{-28}$              | $\sigma_8(0.15)$            | $0.742^{+0.012}_{-0.011}$    |
| $A_{217}^{PS}$              | $104^{+30}_{-30}$               | $D_{1420}$                  | $814^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.466^{+0.013}_{-0.013}$    |
| $A_{217}^{CIB}$             | $37^{+10}_{-10}$                | $D_{2000}$                  | $231.8^{+3.7}_{-3.8}$           | $\sigma_8(0.38)$            | $0.6584^{+0.0099}_{-0.0094}$ |
| $A_{143}^{tSZ}$             | $4.1^{+3.5}_{-4.0}$             | $n_{s,0.002}$               | $0.9721^{+0.0093}_{-0.0091}$    | $f\sigma_8(0.51)$           | $0.466^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{PS}$   | $0.68^{+0.27}_{-0.24}$          | $Y_P$                       | $0.24544^{+0.00017}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.6166^{+0.0090}_{-0.0085}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24677^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.461^{+0.010}_{-0.010}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.563^{+0.083}_{-0.077}$       | $\sigma_8(0.61)$            | $0.5870^{+0.0084}_{-0.0079}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.765^{+0.065}_{-0.062}$      | $f\sigma_8(2.33)$           | $0.2964^{+0.0041}_{-0.0038}$ |
| $A_{100}^{dust}$            | $1.01^{+0.37}_{-0.38}$          | $z_*$                       | $1089.57^{+0.66}_{-0.64}$       | $\sigma_8(2.33)$            | $0.3060^{+0.0042}_{-0.0039}$ |
| $A_{143}^{dust}$            | $0.96^{+0.35}_{-0.34}$          | $r_*$                       | $144.91^{+0.63}_{-0.59}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04141^{+0.00082}_{-0.00085}$ | $f_{2000}^{217}$            | $104.8^{+4.3}_{-4.3}$        |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.915^{+0.062}_{-0.058}$      | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$               |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $z_{drag}$                  | $1060.07^{+0.93}_{-0.98}$       | $\chi_{simall}^2$           | $396.4 (\nu: 0.6)$           |
| $c_{217}$                   | $1.0008^{+0.0032}_{-0.0030}$    | $r_{drag}$                  | $147.54^{+0.68}_{-0.64}$        | $\chi_{lowl}^2$             | $22.05 (\nu: 0.3)$           |
| $H_0$                       | $68.4^{+1.2}_{-1.2}$            | $k_D$                       | $0.14049^{+0.00083}_{-0.00088}$ | $\chi_{CamSpec}^2$          | $7058.9 (\nu: 13.3)$         |
| $\Omega_\Lambda$            | $0.698^{+0.015}_{-0.016}$       | $100\theta_D$               | $0.16071^{+0.00056}_{-0.00052}$ | $\chi_{6DF}^2$              | $0.049 (\nu: 0.0)$           |
| $\Omega_m$                  | $0.302^{+0.016}_{-0.015}$       | $z_{eq}$                    | $3352^{+58}_{-57}$              | $\chi_{MGS}^2$              | $2.00 (\nu: 0.2)$            |
| $\Omega_m h^2$              | $0.1409^{+0.0024}_{-0.0024}$    | $k_{eq}$                    | $0.01023^{+0.00018}_{-0.00017}$ | $\chi_{DR12BAO}^2$          | $4.06 (\nu: 0.5)$            |
| $\Omega_m h^3$              | $0.09632^{+0.00093}_{-0.00098}$ | $100\theta_{eq}$            | $0.823^{+0.011}_{-0.011}$       | $\chi_{prior}^2$            | $7.3 (\nu: 5.7)$             |
| $\sigma_8$                  | $0.801^{+0.014}_{-0.013}$       | $100\theta_{s,eq}$          | $0.4543^{+0.0056}_{-0.0057}$    | $\chi_{BAO}^2$              | $6.1 (\nu: 0.8)$             |
| $S_8$                       | $0.804^{+0.031}_{-0.030}$       | $H(0.15)$                   | $73.5^{+1.0}_{-1.0}$            | $\chi_{CMB}^2$              | $7477.4 (\nu: 13.9)$         |
| $\sigma_8 \Omega_m^{0.5}$   | $0.440^{+0.017}_{-0.016}$       | $D_M(0.15)$                 | $635^{+10}_{-9.9}$              |                             |                              |

$$\bar{\chi}_{eff}^2 = 7490.78; \Delta \bar{\chi}_{eff}^2 = -6.53; R - 1 = 0.01851$$



### 3.6 base\_Alens\_CamSpecHM\_TT\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02293^{+0.00050}_{-0.00050}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.412^{+0.025}_{-0.024}$       | $H(0.15)$                   | $75.5^{+1.7}_{-1.7}$         |
| $\Omega_{\text{c}}h^2$               | $0.1133^{+0.0040}_{-0.0037}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.569^{+0.023}_{-0.021}$       | $D_{\text{M}}(0.15)$        | $617^{+16}_{-15}$            |
| $100\theta_{\text{MC}}$              | $1.04192^{+0.00099}_{-0.00095}$ | $\sigma_8/h^{0.5}$                 | $0.935^{+0.033}_{-0.030}$       | $H(0.38)$                   | $84.9^{+1.3}_{-1.3}$         |
| $\tau$                               | $0.055^{+0.013}_{-0.011}$       | $r_{\text{drag}}h$                 | $104.7^{+3.1}_{-3.3}$           | $D_{\text{M}}(0.38)$        | $1479^{+32}_{-31}$           |
| $A_{\text{L}}$                       | $1.33^{+0.19}_{-0.18}$          | $\langle d^2 \rangle^{1/2}$        | $2.67^{+0.15}_{-0.15}$          | $H(0.51)$                   | $91.3^{+1.0}_{-1.0}$         |
| $\ln(10^{10}A_{\text{s}})$           | $3.029^{+0.029}_{-0.026}$       | $z_{\text{re}}$                    | $< 8.67$                        | $D_{\text{M}}(0.51)$        | $1922^{+38}_{-36}$           |
| $n_{\text{s}}$                       | $0.984^{+0.011}_{-0.012}$       | $10^9 A_{\text{s}}$                | $2.068^{+0.059}_{-0.053}$       | $H(0.61)$                   | $96.60^{+0.84}_{-0.86}$      |
| $y_{\text{cal}}$                     | $1.0000^{+0.0046}_{-0.0049}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.851^{+0.026}_{-0.025}$       | $D_{\text{M}}(0.61)$        | $2242^{+41}_{-39}$           |
| $A_{100}^{\text{PS}}$                | $225^{+50}_{-50}$               | $D_{40}$                           | $1188^{+31}_{-28}$              | $H(2.33)$                   | $232.8^{+2.3}_{-2.2}$        |
| $A_{143}^{\text{PS}}$                | $30^{+20}_{-20}$                | $D_{220}$                          | $5744^{+84}_{-81}$              | $D_{\text{M}}(2.33)$        | $5709^{+38}_{-36}$           |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $D_{810}$                          | $2520^{+27}_{-28}$              | $f\sigma_8(0.15)$           | $0.419^{+0.024}_{-0.023}$    |
| $A_{217}^{\text{CIB}}$               | $35^{+10}_{-10}$                | $D_{1420}$                         | $815.4^{+9.5}_{-10}$            | $\sigma_8(0.15)$            | $0.729^{+0.015}_{-0.015}$    |
| $A_{143}^{\text{tSZ}}$               | $4.4^{+3.7}_{-4.2}$             | $D_{2000}$                         | $233.7^{+3.8}_{-3.9}$           | $f\sigma_8(0.38)$           | $0.444^{+0.020}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.69^{+0.29}_{-0.25}$          | $n_{\text{s},0.002}$               | $0.984^{+0.011}_{-0.012}$       | $\sigma_8(0.38)$            | $0.651^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24562^{+0.00022}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.447^{+0.017}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24695^{+0.00022}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.611^{+0.011}_{-0.010}$    |
| $A^{\text{kSZ}}$                     | $< 8.50$                        | $10^5 \text{D}/\text{H}$           | $2.486^{+0.089}_{-0.086}$       | $f\sigma_8(0.61)$           | $0.445^{+0.015}_{-0.014}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$            | $13.680^{+0.084}_{-0.080}$      | $\sigma_8(0.61)$            | $0.582^{+0.010}_{-0.0092}$   |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.34}$          | $z_*$                              | $1088.65^{+0.86}_{-0.78}$       | $f\sigma_8(2.33)$           | $0.2951^{+0.0045}_{-0.0042}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $r_*$                              | $145.77^{+0.82}_{-0.88}$        | $\sigma_8(2.33)$            | $0.3060^{+0.0045}_{-0.0041}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.00^{+0.35}_{-0.33}$          | $100\theta_*$                      | $1.04206^{+0.00099}_{-0.00093}$ | $f_{2000}^{143}$            | $24^{+6}_{-6}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0020}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.988^{+0.078}_{-0.081}$      | $f_{2000}^{217}$            | $102.9^{+4.4}_{-4.4}$        |
| $c_{217}$                            | $1.0005^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$                  | $1060.7^{+1.0}_{-1.0}$          | $f_{2000}^{143 \times 217}$ | $28^{+5}_{-5}$               |
| $H_0$                                | $70.6^{+1.9}_{-1.9}$            | $r_{\text{drag}}$                  | $148.27^{+0.88}_{-0.86}$        | $\chi_{\text{simall}}^2$    | $396.5 (\nu: 0.8)$           |
| $\Omega_{\Lambda}$                   | $0.725^{+0.020}_{-0.023}$       | $k_{\text{D}}$                     | $0.14003^{+0.00092}_{-0.00099}$ | $\chi_{\text{lowl}}^2$      | $20.65 (\nu: 0.2)$           |
| $\Omega_{\text{m}}$                  | $0.275^{+0.023}_{-0.020}$       | $100\theta_{\text{D}}$             | $0.16039^{+0.00054}_{-0.00053}$ | $\chi_{\text{CamSpec}}^2$   | $7062.6 (\nu: 16.9)$         |
| $\Omega_{\text{m}}h^2$               | $0.1369^{+0.0037}_{-0.0035}$    | $z_{\text{eq}}$                    | $3255^{+88}_{-83}$              | $\chi_{\text{H073p45}}^2$   | $3.3 (\nu: 2.2)$             |
| $\Omega_{\text{m}}h^3$               | $0.09661^{+0.00094}_{-0.00095}$ | $k_{\text{eq}}$                    | $0.00993^{+0.00027}_{-0.00025}$ | $\chi_{\text{prior}}^2$     | $6.9 (\nu: 4.8)$             |
| $\sigma_8$                           | $0.785^{+0.018}_{-0.018}$       | $100\theta_{\text{eq}}$            | $0.843^{+0.017}_{-0.018}$       | $\chi_{\text{CMB}}^2$       | $7479.7 (\nu: 17.3)$         |
| $S_8$                                | $0.752^{+0.046}_{-0.043}$       | $100\theta_{\text{s,eq}}$          | $0.4645^{+0.0087}_{-0.0091}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7489.90; \Delta\bar{\chi}_{\text{eff}}^2 = -12.74; R - 1 = 0.05184$$



### 3.7 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022542 | $0.02251^{+0.00038}_{-0.00038}$ | $\sigma_8$                     | 0.8000   | $0.799^{+0.017}_{-0.017}$       | $100\theta_{\text{eq}}$     | 0.8228   | $0.822^{+0.014}_{-0.013}$    |
| $\Omega_c h^2$                       | 0.11776  | $0.1179^{+0.0030}_{-0.0031}$    | $S_8$                          | 0.8023   | $0.802^{+0.037}_{-0.037}$       | $100\theta_{\text{s,eq}}$   | 0.4542   | $0.4540^{+0.0069}_{-0.0066}$ |
| $100\theta_{\text{MC}}$              | 1.04109  | $1.04108^{+0.00067}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.4394   | $0.439^{+0.021}_{-0.020}$       | $H(0.15)$                   | 73.53    | $73.5^{+1.3}_{-1.2}$         |
| $\tau$                               | 0.0508   | $0.050^{+0.015}_{-0.017}$       | $\sigma_8 \Omega_m^{0.25}$     | 0.5929   | $0.592^{+0.019}_{-0.019}$       | $D_{\text{M}}(0.15)$        | 635.0    | $636^{+12}_{-12}$            |
| $A_{\text{L}}$                       | 1.155    | $1.15^{+0.14}_{-0.14}$          | $\sigma_8/h^{0.5}$             | 0.9676   | $0.967^{+0.027}_{-0.027}$       | $H(0.38)$                   | 83.47    | $83.42^{+0.94}_{-0.90}$      |
| $\ln(10^{10} A_{\text{s}})$          | 3.0309   | $3.028^{+0.032}_{-0.035}$       | $r_{\text{drag}} h$            | 100.81   | $100.7^{+2.5}_{-2.4}$           | $D_{\text{M}}(0.38)$        | 1516.8   | $1518^{+24}_{-24}$           |
| $n_{\text{s}}$                       | 0.9725   | $0.971^{+0.010}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$    | 2.570    | $2.56^{+0.13}_{-0.13}$          | $H(0.51)$                   | 90.09    | $90.05^{+0.76}_{-0.72}$      |
| $y_{\text{cal}}$                     | 1.00007  | $1.0000^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                | 7.25     | $7.1^{+1.6}_{-1.7}$             | $D_{\text{M}}(0.51)$        | 1966.4   | $1968^{+28}_{-29}$           |
| $A_{100}^{\text{PS}}$                | 223.5    | $232^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | 2.072    | $2.065^{+0.068}_{-0.072}$       | $H(0.61)$                   | 95.64    | $95.60^{+0.62}_{-0.58}$      |
| $A_{143}^{\text{PS}}$                | 46.5     | $36^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8715   | $1.870^{+0.024}_{-0.023}$       | $D_{\text{M}}(0.61)$        | 2289.4   | $2291^{+31}_{-31}$           |
| $A_{217}^{\text{PS}}$                | 109.5    | $105^{+20}_{-30}$               | $D_{40}$                       | 1211.5   | $1213^{+27}_{-26}$              | $H(2.33)$                   | 235.27   | $235.3^{+1.8}_{-1.8}$        |
| $A_{217}^{\text{CIB}}$               | 37.8     | $37^{+10}_{-10}$                | $D_{220}$                      | 5726     | $5723^{+76}_{-76}$              | $D_{\text{M}}(2.33)$        | 5748.6   | $5750^{+27}_{-28}$           |
| $A_{143}^{\text{tSZ}}$               | 6.07     | $4.1^{+3.6}_{-4.0}$             | $D_{810}$                      | 2531.0   | $2528^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4447   | $0.445^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.792    | $0.68^{+0.27}_{-0.25}$          | $D_{1420}$                     | 816.1    | $814.6^{+9.4}_{-9.4}$           | $\sigma_8(0.15)$            | 0.7402   | $0.739^{+0.014}_{-0.015}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.70     | —                               | $D_{2000}$                     | 232.14   | $231.5^{+3.4}_{-3.5}$           | $f\sigma_8(0.38)$           | 0.4650   | $0.465^{+0.016}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.94     | —                               | $n_{\text{s},0.002}$           | 0.9725   | $0.971^{+0.010}_{-0.010}$       | $\sigma_8(0.38)$            | 0.6572   | $0.656^{+0.012}_{-0.013}$    |
| $A^{\text{kSZ}}$                     | 0.2      | —                               | $Y_{\text{P}}$                 | 0.245459 | $0.24545^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | 0.4647   | $0.464^{+0.014}_{-0.014}$    |
| $A_{100}^{\text{dust}}$              | 1.021    | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246786 | $0.24677^{+0.00015}_{-0.00015}$ | $\sigma_8(0.51)$            | 0.6155   | $0.614^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{dust}}$              | 0.946    | $0.95^{+0.34}_{-0.34}$          | $10^5 D/\text{H}$              | 2.555    | $2.561^{+0.071}_{-0.069}$       | $f\sigma_8(0.61)$           | 0.4606   | $0.460^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{dust}}$              | 0.993    | $0.98^{+0.21}_{-0.20}$          | Age/Gyr                        | 13.765   | $13.769^{+0.059}_{-0.061}$      | $\sigma_8(0.61)$            | 0.5859   | $0.585^{+0.010}_{-0.011}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.050    | $1.02^{+0.32}_{-0.31}$          | $z_*$                          | 1089.51  | $1089.56^{+0.67}_{-0.67}$       | $f\sigma_8(2.33)$           | 0.2958   | $0.2952^{+0.0050}_{-0.0053}$ |
| $c_{100}$                            | 0.99794  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                          | 144.88   | $144.88^{+0.66}_{-0.63}$        | $\sigma_8(2.33)$            | 0.3054   | $0.3048^{+0.0051}_{-0.0055}$ |
| $c_{217}$                            | 1.00093  | $1.0009^{+0.0031}_{-0.0030}$    | $100\theta_*$                  | 1.04127  | $1.04125^{+0.00065}_{-0.00063}$ | $f_{2000}^{143}$            | 26.7     | $27^{+6}_{-6}$               |
| $c_{TE}$                             | 0.9917   | $0.992^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.914   | $13.914^{+0.060}_{-0.058}$      | $f_{2000}^{217}$            | 104.43   | $105.1^{+4.1}_{-4.0}$        |
| $c_{EE}$                             | 0.9902   | $0.9903^{+0.0097}_{-0.0096}$    | $z_{\text{drag}}$              | 1060.16  | $1060.10^{+0.74}_{-0.78}$       | $f_{2000}^{143 \times 217}$ | 29.81    | $30^{+4}_{-4}$               |
| $H_0$                                | 68.35    | $68.3^{+1.4}_{-1.4}$            | $r_{\text{drag}}$              | 147.50   | $147.50^{+0.64}_{-0.61}$        | $\chi_{\text{small}}^2$     | 395.68   | $396.8 (\nu: 1.1)$           |
| $\Omega_{\Lambda}$                   | 0.6983   | $0.697^{+0.018}_{-0.019}$       | $k_{\text{D}}$                 | 0.14057  | $0.14054^{+0.00066}_{-0.00069}$ | $\chi_{\text{lowl}}^2$      | 21.90    | $22.12 (\nu: 0.4)$           |
| $\Omega_{\text{m}}$                  | 0.3017   | $0.303^{+0.019}_{-0.018}$       | $100\theta_{\text{D}}$         | 0.160623 | $0.16066^{+0.00044}_{-0.00042}$ | $\chi_{\text{CamSpec}}^2$   | 11496.5  | $11512.3 (\nu: 16.0)$        |
| $\Omega_{\text{m}} h^2$              | 0.14095  | $0.1410^{+0.0028}_{-0.0028}$    | $z_{\text{eq}}$                | 3353     | $3355^{+67}_{-68}$              | $\chi_{\text{prior}}^2$     | 1.9      | $7.7 (\nu: 5.6)$             |
| $\Omega_{\text{m}} h^3$              | 0.09633  | $0.09629^{+0.00066}_{-0.00066}$ | $k_{\text{eq}}$                | 0.010233 | $0.01024^{+0.00021}_{-0.00021}$ | $\chi_{\text{CMB}}^2$       | 11914.1  | $11931.2 (\nu: 16.9)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11915.94$ ;  $\Delta\chi_{\text{eff}}^2 = -4.82$ ;  $\bar{\chi}_{\text{eff}}^2 = 11938.97$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -3.49$ ;  $R - 1 = 0.01096$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.68 ( $\Delta$  -0.22) commander\_dx12\_v3\_2\_29: 21.90 ( $\Delta$  -1.10) CamSpec like\_10.7HM\_1400\_unified: 11496.51 ( $\Delta$  -3.14)



### 3.8 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02249^{+0.00032}_{-0.00033}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.441^{+0.015}_{-0.015}$       | $H(0.38)$                   | $83.37^{+0.65}_{-0.64}$      |
| $\Omega_c h^2$                       | $0.1181^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.593^{+0.015}_{-0.015}$       | $D_M(0.38)$                 | $1519^{+17}_{-17}$           |
| $100\theta_{MC}$                     | $1.04106^{+0.00060}_{-0.00058}$ | $\sigma_8/h^{0.5}$          | $0.968^{+0.022}_{-0.023}$       | $H(0.51)$                   | $90.01^{+0.53}_{-0.52}$      |
| $\tau$                               | $0.049^{+0.015}_{-0.017}$       | $r_{\text{drag}} h$         | $100.6^{+1.7}_{-1.7}$           | $D_M(0.51)$                 | $1970^{+20}_{-20}$           |
| $A_L$                                | $1.14^{+0.13}_{-0.13}$          | $\langle d^2 \rangle^{1/2}$ | $2.56^{+0.12}_{-0.13}$          | $H(0.61)$                   | $95.57^{+0.45}_{-0.44}$      |
| $\ln(10^{10} A_s)$                   | $3.028^{+0.033}_{-0.036}$       | $z_{\text{re}}$             | $7.1^{+1.7}_{-1.8}$             | $D_M(0.61)$                 | $2293^{+22}_{-22}$           |
| $n_s$                                | $0.9708^{+0.0081}_{-0.0084}$    | $10^9 A_s$                  | $2.065^{+0.069}_{-0.074}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$        |
| $y_{\text{cal}}$                     | $1.0000^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.022}_{-0.021}$       | $D_M(2.33)$                 | $5752^{+21}_{-21}$           |
| $A_{100}^{\text{PS}}$                | $232^{+50}_{-50}$               | $D_{40}$                    | $1214^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.446^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $36^{+20}_{-20}$                | $D_{220}$                   | $5722^{+75}_{-74}$              | $\sigma_8(0.15)$            | $0.739^{+0.014}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $D_{810}$                   | $2528^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.465^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{1420}$                  | $814.6^{+9.4}_{-9.4}$           | $\sigma_8(0.38)$            | $0.656^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $4.1^{+3.6}_{-4.0}$             | $D_{2000}$                  | $231.4^{+3.3}_{-3.3}$           | $f\sigma_8(0.51)$           | $0.465^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.27}_{-0.26}$          | $n_{s,0.002}$               | $0.9708^{+0.0081}_{-0.0084}$    | $\sigma_8(0.51)$            | $0.615^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24544^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.461^{+0.010}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24677^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.585^{+0.010}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$    | $2.563^{+0.062}_{-0.058}$       | $f\sigma_8(2.33)$           | $0.2953^{+0.0050}_{-0.0054}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.772^{+0.047}_{-0.047}$      | $\sigma_8(2.33)$            | $0.3047^{+0.0052}_{-0.0056}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.34}$          | $z_*$                       | $1089.60^{+0.53}_{-0.51}$       | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $r_*$                       | $144.84^{+0.49}_{-0.48}$        | $f_{2000}^{217}$            | $105.1^{+3.9}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04123^{+0.00059}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.047}_{-0.046}$      | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.2)$           |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1060.08^{+0.69}_{-0.72}$       | $\chi_{\text{lowl}}^2$      | $22.17 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.993^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $147.47^{+0.51}_{-0.50}$        | $\chi_{\text{CamSpec}}^2$   | $11511.8 (\nu: 15.2)$        |
| $c_{EE}$                             | $0.9903^{+0.0098}_{-0.0096}$    | $k_D$                       | $0.14056^{+0.00061}_{-0.00065}$ | $\chi_{6\text{DF}}^2$       | $0.030 (\nu: 0.0)$           |
| $H_0$                                | $68.19^{+0.99}_{-0.99}$         | $100\theta_D$               | $0.16067^{+0.00041}_{-0.00040}$ | $\chi_{\text{MGS}}^2$       | $1.81 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | $0.696^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3359^{+47}_{-48}$              | $\chi_{\text{DR12BAO}}^2$   | $3.93 (\nu: 0.3)$            |
| $\Omega_m$                           | $0.304^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01025^{+0.00014}_{-0.00015}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^2$                       | $0.1412^{+0.0020}_{-0.0020}$    | $100\theta_{\text{eq}}$     | $0.8216^{+0.0092}_{-0.0090}$    | $\chi_{\text{BAO}}^2$       | $5.77 (\nu: 0.3)$            |
| $\Omega_m h^3$                       | $0.09628^{+0.00064}_{-0.00066}$ | $100\theta_{s,\text{eq}}$   | $0.4536^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | $11930.7 (\nu: 16.4)$        |
| $\sigma_8$                           | $0.799^{+0.015}_{-0.016}$       | $H(0.15)$                   | $73.39^{+0.86}_{-0.86}$         |                             |                              |
| $S_8$                                | $0.804^{+0.027}_{-0.027}$       | $D_M(0.15)$                 | $636.3^{+8.4}_{-8.3}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11944.29; \Delta\bar{\chi}_{\text{eff}}^2 = -3.99; R - 1 = 0.01598$$



### 3.9 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02268^{+0.00034}_{-0.00035}$ | $S_8$                       | $0.783^{+0.034}_{-0.034}$       | $H(0.15)$                   | $74.2^{+1.1}_{-1.1}$         |
| $\Omega_c h^2$              | $0.1161^{+0.0028}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.429^{+0.019}_{-0.019}$       | $D_M(0.15)$                 | $629^{+11}_{-11}$            |
| $100\theta_{MC}$            | $1.04132^{+0.00069}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.583^{+0.018}_{-0.019}$       | $H(0.38)$                   | $83.97^{+0.84}_{-0.85}$      |
| $\tau$                      | $0.051^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | $0.954^{+0.026}_{-0.026}$       | $D_M(0.38)$                 | $1504^{+22}_{-22}$           |
| $A_L$                       | $1.19^{+0.14}_{-0.14}$          | $r_{drag}h$                 | $102.1^{+2.3}_{-2.3}$           | $H(0.51)$                   | $90.49^{+0.66}_{-0.69}$      |
| $\ln(10^{10} A_s)$          | $3.026^{+0.032}_{-0.034}$       | $\langle d^2 \rangle^{1/2}$ | $2.58^{+0.13}_{-0.13}$          | $D_M(0.51)$                 | $1951^{+26}_{-25}$           |
| $n_s$                       | $0.9760^{+0.0092}_{-0.0096}$    | $z_{re}$                    | $7.2^{+1.5}_{-1.7}$             | $H(0.61)$                   | $95.95^{+0.57}_{-0.56}$      |
| $y_{cal}$                   | $1.0000^{+0.0046}_{-0.0049}$    | $10^9 A_s$                  | $2.063^{+0.066}_{-0.070}$       | $D_M(0.61)$                 | $2273^{+28}_{-27}$           |
| $A_{100}^{PS}$              | $228^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.863^{+0.023}_{-0.022}$       | $H(2.33)$                   | $234.4^{+1.6}_{-1.6}$        |
| $A_{143}^{PS}$              | $33^{+20}_{-20}$                | $D_{40}$                    | $1204^{+26}_{-25}$              | $D_M(2.33)$                 | $5735^{+25}_{-26}$           |
| $A_{217}^{PS}$              | $105^{+20}_{-30}$               | $D_{220}$                   | $5733^{+83}_{-76}$              | $f\sigma_8(0.15)$           | $0.435^{+0.018}_{-0.018}$    |
| $A_{217}^{CIB}$             | $36^{+10}_{-10}$                | $D_{810}$                   | $2526^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.735^{+0.014}_{-0.016}$    |
| $A_{143}^{tSZ}$             | $4.2^{+3.6}_{-4.0}$             | $D_{1420}$                  | $815.5^{+9.1}_{-9.1}$           | $f\sigma_8(0.38)$           | $0.457^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{PS}$   | $0.68^{+0.27}_{-0.26}$          | $D_{2000}$                  | $232.4^{+3.1}_{-3.2}$           | $\sigma_8(0.38)$            | $0.654^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $n_{s,0.002}$               | $0.9760^{+0.0092}_{-0.0096}$    | $f\sigma_8(0.51)$           | $0.458^{+0.013}_{-0.014}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P$                       | $0.24551^{+0.00015}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.612^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | —                               | $Y_P^{BBN}$                 | $0.24684^{+0.00015}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.454^{+0.012}_{-0.012}$    |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.37}$          | $10^5 D/H$                  | $2.530^{+0.063}_{-0.061}$       | $\sigma_8(0.61)$            | $0.583^{+0.010}_{-0.011}$    |
| $A_{143}^{dust}$            | $0.94^{+0.35}_{-0.33}$          | Age/Gyr                     | $13.737^{+0.056}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.2949^{+0.0049}_{-0.0051}$ |
| $A_{217}^{dust}$            | $0.99^{+0.20}_{-0.20}$          | $z_*$                       | $1089.20^{+0.61}_{-0.58}$       | $\sigma_8(2.33)$            | $0.3050^{+0.0051}_{-0.0053}$ |
| $A_{143 \times 217}^{dust}$ | $1.01^{+0.31}_{-0.30}$          | $r_*$                       | $145.20^{+0.62}_{-0.61}$        | $f_{2000}^{143}$            | $26^{+6}_{-5}$               |
| $c_{100}$                   | $0.9976^{+0.0022}_{-0.0021}$    | $100\theta_*$               | $1.04147^{+0.00068}_{-0.00064}$ | $f_{2000}^{217}$            | $104.2^{+4.1}_{-3.7}$        |
| $c_{217}$                   | $1.0009^{+0.0030}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.941^{+0.058}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | $29^{+4}_{-4}$               |
| $c_{TE}$                    | $0.991^{+0.010}_{-0.010}$       | $z_{drag}$                  | $1060.38^{+0.70}_{-0.71}$       | $\chi_{simall}^2$           | $396.7 (\nu: 1.1)$           |
| $c_{EE}$                    | $0.9899^{+0.0098}_{-0.0097}$    | $r_{drag}$                  | $147.77^{+0.60}_{-0.60}$        | $\chi_{lowl}^2$             | $21.45 (\nu: 0.3)$           |
| $H_0$                       | $69.1^{+1.3}_{-1.3}$            | $k_D$                       | $0.14038^{+0.00068}_{-0.00067}$ | $\chi_{CamSpec}^2$          | $11514.4 (\nu: 19.8)$        |
| $\Omega_\Lambda$            | $0.708^{+0.016}_{-0.017}$       | $100\theta_D$               | $0.16053^{+0.00040}_{-0.00040}$ | $\chi_{H073p45}^2$          | $7.0 (\nu: 2.3)$             |
| $\Omega_m$                  | $0.292^{+0.017}_{-0.016}$       | $z_{eq}$                    | $3318^{+63}_{-60}$              | $\chi_{prior}^2$            | $7.8 (\nu: 5.6)$             |
| $\Omega_m h^2$              | $0.1395^{+0.0026}_{-0.0025}$    | $k_{eq}$                    | $0.01013^{+0.00019}_{-0.00018}$ | $\chi_{CMB}^2$              | $11932.6 (\nu: 20.0)$        |
| $\Omega_m h^3$              | $0.09640^{+0.00068}_{-0.00064}$ | $100\theta_{eq}$            | $0.830^{+0.012}_{-0.012}$       |                             |                              |
| $\sigma_8$                  | $0.793^{+0.016}_{-0.018}$       | $100\theta_{s,eq}$          | $0.4579^{+0.0061}_{-0.0063}$    |                             |                              |

$$\bar{\chi}_{eff}^2 = 11947.36; \Delta\bar{\chi}_{eff}^2 = -6.91; R - 1 = 0.04484$$



### 3.10 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$   | $0.02251^{+0.00038}_{-0.00038}$ | $\sigma_8$                          | $0.801^{+0.015}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.823^{+0.014}_{-0.013}$    |
| $\Omega_c h^2$   | $0.1178^{+0.0031}_{-0.0031}$    | $S_8$                               | $0.804^{+0.037}_{-0.036}$       | $100\theta_{\text{s,eq}}$   | $0.4541^{+0.0069}_{-0.0067}$ |
| $100\theta_{\text{MC}}$  | $1.04108^{+0.00067}_{-0.00065}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.441^{+0.020}_{-0.020}$       | $H(0.15)$                   | $73.5^{+1.3}_{-1.2}$         |
| $\tau$   | $0.0526^{+0.011}_{-0.0094}$     | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.594^{+0.019}_{-0.018}$       | $D_{\text{M}}(0.15)$        | $636^{+12}_{-12}$            |
| $A_{\text{L}}$   | $1.14^{+0.14}_{-0.14}$          | $\sigma_8/h^{0.5}$                  | $0.970^{+0.026}_{-0.026}$       | $H(0.38)$                   | $83.43^{+0.94}_{-0.91}$      |
| $\ln(10^{10} A_{\text{s}})$  | $3.034^{+0.026}_{-0.023}$       | $r_{\text{drag}} h$                 | $100.7^{+2.5}_{-2.5}$           | $D_{\text{M}}(0.38)$        | $1518^{+25}_{-24}$           |
| $n_{\text{s}}$   | $0.971^{+0.010}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$         | $2.56^{+0.12}_{-0.13}$          | $H(0.51)$                   | $90.06^{+0.76}_{-0.72}$      |
| $y_{\text{cal}}$   | $1.0000^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                     | $< 8.51$                        | $D_{\text{M}}(0.51)$        | $1968^{+29}_{-29}$           |
| $A_{100}^{\text{PS}}$  | $231^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | $2.078^{+0.054}_{-0.048}$       | $H(0.61)$                   | $95.61^{+0.62}_{-0.59}$      |
| $A_{143}^{\text{PS}}$  | $35^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.870^{+0.024}_{-0.023}$       | $D_{\text{M}}(0.61)$        | $2291^{+31}_{-31}$           |
| $A_{217}^{\text{PS}}$  | $105^{+30}_{-30}$               | $D_{40}$                            | $1213^{+27}_{-26}$              | $H(2.33)$                   | $235.3^{+1.8}_{-1.8}$        |
| $A_{217}^{\text{CIB}}$   | $37^{+10}_{-10}$                | $D_{220}$                           | $5723^{+76}_{-75}$              | $D_{\text{M}}(2.33)$        | $5750^{+27}_{-28}$           |
| $A_{143}^{\text{tSZ}}$   | $4.1^{+3.6}_{-4.0}$             | $D_{810}$                           | $2528^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.446^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$   | $0.68^{+0.27}_{-0.25}$          | $D_{1420}$                          | $814.7^{+9.6}_{-9.6}$           | $\sigma_8(0.15)$            | $0.741^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$  | —                               | $D_{2000}$                          | $231.5^{+3.4}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.466^{+0.015}_{-0.015}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$   | —                               | $n_{\text{s},0.002}$                | $0.971^{+0.010}_{-0.010}$       | $\sigma_8(0.38)$            | $0.658^{+0.010}_{-0.0089}$   |
| $A^{\text{kSZ}}$   | —                               | $Y_{\text{P}}$                      | $0.24545^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | $0.466^{+0.013}_{-0.013}$    |
| $A_{100}^{\text{dust}}$  | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$         | $0.24677^{+0.00015}_{-0.00015}$ | $\sigma_8(0.51)$            | $0.6162^{+0.0094}_{-0.0078}$ |
| $A_{143}^{\text{dust}}$  | $0.95^{+0.34}_{-0.34}$          | $10^5 \text{D}/\text{H}$            | $2.561^{+0.071}_{-0.069}$       | $f\sigma_8(0.61)$           | $0.461^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{dust}}$  | $0.98^{+0.21}_{-0.20}$          | $\text{Age}/\text{Gyr}$             | $13.769^{+0.060}_{-0.061}$      | $\sigma_8(0.61)$            | $0.5866^{+0.0084}_{-0.0076}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.31}$          | $z_*$                               | $1089.56^{+0.68}_{-0.67}$       | $f\sigma_8(2.33)$           | $0.2961^{+0.0040}_{-0.0036}$ |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                               | $144.89^{+0.65}_{-0.64}$        | $\sigma_8(2.33)$            | $0.3057^{+0.0041}_{-0.0036}$ |
| $c_{217}$  | $1.0009^{+0.0031}_{-0.0030}$    | $100\theta_*$                       | $1.04125^{+0.00065}_{-0.00064}$ | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $c_{TE}$   | $0.992^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.914^{+0.060}_{-0.059}$      | $f_{2000}^{217}$            | $105.0^{+4.2}_{-4.0}$        |
| $c_{EE}$   | $0.9903^{+0.0097}_{-0.0094}$    | $z_{\text{drag}}$                   | $1060.10^{+0.75}_{-0.78}$       | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $H_0$  | $68.3^{+1.5}_{-1.4}$            | $r_{\text{drag}}$                   | $147.51^{+0.63}_{-0.61}$        | $\chi_{\text{simall}}^2$    | $396.4 (\nu: 0.6)$           |
| $\Omega_{\Lambda}$   | $0.698^{+0.018}_{-0.019}$       | $k_{\text{D}}$                      | $0.14053^{+0.00066}_{-0.00069}$ | $\chi_{\text{lowl}}^2$      | $22.16 (\nu: 0.4)$           |
| $\Omega_{\text{m}}$  | $0.302^{+0.019}_{-0.018}$       | $100\theta_{\text{D}}$              | $0.16066^{+0.00044}_{-0.00043}$ | $\chi_{\text{CamSpec}}^2$   | $11512.3 (\nu: 16.0)$        |
| $\Omega_{\text{m}} h^2$  | $0.1410^{+0.0029}_{-0.0029}$    | $z_{\text{eq}}$                     | $3354^{+68}_{-68}$              | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^3$  | $0.09628^{+0.00066}_{-0.00066}$ | $k_{\text{eq}}$                     | $0.01024^{+0.00021}_{-0.00021}$ | $\chi_{\text{CMB}}^2$       | $11930.9 (\nu: 16.5)$        |
| $\bar{\chi}_{\text{eff}}^2 = 11938.62; \Delta\bar{\chi}_{\text{eff}}^2 = -3.57; R - 1 = 0.01153$ |                                 |                                     |                                 |                             |                              |



### 3.11 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02249^{+0.00032}_{-0.00034}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.015}_{-0.014}$       | $H(0.38)$                   | $83.37^{+0.65}_{-0.65}$      |
| $\Omega_c h^2$                       | $0.1180^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.595^{+0.014}_{-0.013}$       | $D_M(0.38)$                 | $1519^{+17}_{-17}$           |
| $100\theta_{MC}$                     | $1.04106^{+0.00060}_{-0.00058}$ | $\sigma_8/h^{0.5}$          | $0.971^{+0.020}_{-0.019}$       | $H(0.51)$                   | $90.01^{+0.53}_{-0.53}$      |
| $\tau$                               | $0.0526^{+0.011}_{-0.0094}$     | $r_{\text{drag}} h$         | $100.6^{+1.7}_{-1.7}$           | $D_M(0.51)$                 | $1969^{+20}_{-20}$           |
| $A_L$                                | $1.14^{+0.13}_{-0.12}$          | $\langle d^2 \rangle^{1/2}$ | $2.56^{+0.12}_{-0.13}$          | $H(0.61)$                   | $95.57^{+0.45}_{-0.44}$      |
| $\ln(10^{10} A_s)$                   | $3.034^{+0.026}_{-0.023}$       | $z_{\text{re}}$             | $< 8.51$                        | $D_M(0.61)$                 | $2293^{+22}_{-22}$           |
| $n_s$                                | $0.9710^{+0.0082}_{-0.0084}$    | $10^9 A_s$                  | $2.078^{+0.054}_{-0.047}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$        |
| $y_{\text{cal}}$                     | $1.0000^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | $5752^{+21}_{-21}$           |
| $A_{100}^{\text{PS}}$                | $232^{+50}_{-50}$               | $D_{40}$                    | $1214^{+24}_{-24}$              | $f\sigma_8(0.15)$           | $0.447^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{PS}}$                | $36^{+20}_{-20}$                | $D_{220}$                   | $5722^{+75}_{-74}$              | $\sigma_8(0.15)$            | $0.742^{+0.011}_{-0.010}$    |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $D_{810}$                   | $2528^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.467^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{1420}$                  | $814.6^{+9.5}_{-9.4}$           | $\sigma_8(0.38)$            | $0.6584^{+0.0095}_{-0.0085}$ |
| $A_{143}^{\text{tSZ}}$               | $4.1^{+3.6}_{-4.0}$             | $D_{2000}$                  | $231.5^{+3.4}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.466^{+0.010}_{-0.0097}$   |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.27}_{-0.26}$          | $n_{s,0.002}$               | $0.9710^{+0.0082}_{-0.0084}$    | $\sigma_8(0.51)$            | $0.6165^{+0.0087}_{-0.0077}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24544^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4621^{+0.0094}_{-0.0088}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24677^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.5868^{+0.0081}_{-0.0072}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 D/H$                  | $2.564^{+0.063}_{-0.058}$       | $f\sigma_8(2.33)$           | $0.2962^{+0.0040}_{-0.0035}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | $13.772^{+0.048}_{-0.047}$      | $\sigma_8(2.33)$            | $0.3057^{+0.0041}_{-0.0036}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.35}$          | $z_*$                       | $1089.60^{+0.53}_{-0.52}$       | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $r_*$                       | $144.85^{+0.49}_{-0.48}$        | $f_{2000}^{217}$            | $105.1^{+3.9}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04124^{+0.00059}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.911^{+0.047}_{-0.045}$      | $\chi_{\text{simall}}^2$    | $396.4 (\nu: 0.6)$           |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1060.08^{+0.69}_{-0.72}$       | $\chi_{\text{lowl}}^2$      | $22.22 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.992^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $147.48^{+0.51}_{-0.50}$        | $\chi_{\text{CamSpec}}^2$   | $11511.7 (\nu: 15.1)$        |
| $c_{EE}$                             | $0.9904^{+0.0099}_{-0.0093}$    | $k_D$                       | $0.14055^{+0.00060}_{-0.00065}$ | $\chi_{6\text{DF}}^2$       | $0.031 (\nu: 0.0)$           |
| $H_0$                                | $68.2^{+1.0}_{-1.0}$            | $100\theta_D$               | $0.16068^{+0.00041}_{-0.00040}$ | $\chi_{\text{MGS}}^2$       | $1.82 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | $0.696^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3358^{+47}_{-47}$              | $\chi_{\text{DR12BAO}}^2$   | $3.93 (\nu: 0.3)$            |
| $\Omega_m$                           | $0.304^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01025^{+0.00014}_{-0.00014}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^2$                       | $0.1412^{+0.0020}_{-0.0020}$    | $100\theta_{\text{eq}}$     | $0.8217^{+0.0092}_{-0.0091}$    | $\chi_{\text{BAO}}^2$       | $5.78 (\nu: 0.3)$            |
| $\Omega_m h^3$                       | $0.09628^{+0.00063}_{-0.00067}$ | $100\theta_{s,\text{eq}}$   | $0.4537^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | $11930.3 (\nu: 15.8)$        |
| $\sigma_8$                           | $0.802^{+0.013}_{-0.011}$       | $H(0.15)$                   | $73.40^{+0.86}_{-0.86}$         |                             |                              |
| $S_8$                                | $0.807^{+0.027}_{-0.026}$       | $D_M(0.15)$                 | $636.3^{+8.5}_{-8.3}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11943.89; \Delta\bar{\chi}_{\text{eff}}^2 = -4.10; R - 1 = 0.01823$$



### 3.12 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02268^{+0.00034}_{-0.00034}$ | $S_8$                       | $0.785^{+0.033}_{-0.031}$       | $H(0.15)$                   | $74.2^{+1.0}_{-1.1}$         |
| $\Omega_c h^2$                       | $0.1161^{+0.0028}_{-0.0026}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.430^{+0.018}_{-0.017}$       | $D_M(0.15)$                 | $629^{+11}_{-9.7}$           |
| $100\theta_{MC}$                     | $1.04132^{+0.00065}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.585^{+0.017}_{-0.015}$       | $H(0.38)$                   | $83.97^{+0.79}_{-0.84}$      |
| $\tau$                               | $0.054^{+0.012}_{-0.010}$       | $\sigma_8/h^{0.5}$          | $0.957^{+0.024}_{-0.022}$       | $D_M(0.38)$                 | $1504^{+22}_{-20}$           |
| $A_L$                                | $1.19^{+0.14}_{-0.13}$          | $r_{\text{drag}} h$         | $102.2^{+2.2}_{-2.2}$           | $H(0.51)$                   | $90.49^{+0.64}_{-0.68}$      |
| $\ln(10^{10} A_s)$                   | $3.032^{+0.026}_{-0.024}$       | $\langle d^2 \rangle^{1/2}$ | $2.58^{+0.13}_{-0.13}$          | $D_M(0.51)$                 | $1951^{+26}_{-23}$           |
| $n_s$                                | $0.9761^{+0.0090}_{-0.0095}$    | $z_{\text{re}}$             | $< 8.57$                        | $H(0.61)$                   | $95.95^{+0.53}_{-0.56}$      |
| $y_{\text{cal}}$                     | $1.0000^{+0.0047}_{-0.0050}$    | $10^9 A_s$                  | $2.074^{+0.054}_{-0.050}$       | $D_M(0.61)$                 | $2273^{+28}_{-25}$           |
| $A_{100}^{\text{PS}}$                | $228^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.863^{+0.023}_{-0.021}$       | $H(2.33)$                   | $234.4^{+1.6}_{-1.6}$        |
| $A_{143}^{\text{PS}}$                | $33^{+20}_{-20}$                | $D_{40}$                    | $1204^{+27}_{-25}$              | $D_M(2.33)$                 | $5736^{+25}_{-24}$           |
| $A_{217}^{\text{PS}}$                | $105^{+20}_{-30}$               | $D_{220}$                   | $5733^{+81}_{-76}$              | $f\sigma_8(0.15)$           | $0.436^{+0.017}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $36^{+10}_{-10}$                | $D_{810}$                   | $2526^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.737^{+0.013}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | $4.2^{+3.6}_{-4.0}$             | $D_{1420}$                  | $815.6^{+8.9}_{-9.4}$           | $f\sigma_8(0.38)$           | $0.458^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.27}_{-0.26}$          | $D_{2000}$                  | $232.4^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.655^{+0.011}_{-0.0091}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9761^{+0.0090}_{-0.0095}$    | $f\sigma_8(0.51)$           | $0.459^{+0.013}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24551^{+0.00014}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6142^{+0.0090}_{-0.0084}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24684^{+0.00014}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.456^{+0.011}_{-0.010}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.37}$          | $10^5 D/H$                  | $2.530^{+0.061}_{-0.061}$       | $\sigma_8(0.61)$            | $0.5850^{+0.0084}_{-0.0078}$ |
| $A_{143}^{\text{dust}}$              | $0.94^{+0.35}_{-0.34}$          | $\text{Age/Gyr}$            | $13.737^{+0.055}_{-0.053}$      | $f\sigma_8(2.33)$           | $0.2958^{+0.0041}_{-0.0037}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.20^{+0.61}_{-0.55}$       | $\sigma_8(2.33)$            | $0.3058^{+0.0041}_{-0.0038}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.31}_{-0.31}$          | $r_*$                       | $145.20^{+0.58}_{-0.60}$        | $f_{2000}^{143}$            | $26^{+6}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0022}_{-0.0021}$    | $100\theta_*$               | $1.04147^{+0.00063}_{-0.00063}$ | $f_{2000}^{217}$            | $104.2^{+3.9}_{-3.8}$        |
| $c_{217}$                            | $1.0008^{+0.0030}_{-0.0032}$    | $D_M(z_*)/\text{Gpc}$       | $13.942^{+0.054}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $29^{+4}_{-4}$               |
| $c_{TE}$                             | $0.991^{+0.010}_{-0.010}$       | $z_{\text{drag}}$           | $1060.37^{+0.67}_{-0.71}$       | $\chi_{\text{simall}}^2$    | $396.4 (\nu: 0.7)$           |
| $c_{EE}$                             | $0.9900^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | $147.78^{+0.59}_{-0.59}$        | $\chi_{\text{lowl}}^2$      | $21.48 (\nu: 0.3)$           |
| $H_0$                                | $69.1^{+1.2}_{-1.3}$            | $k_D$                       | $0.14037^{+0.00066}_{-0.00067}$ | $\chi_{\text{CamSpec}}^2$   | $11514.2 (\nu: 17.4)$        |
| $\Omega_\Lambda$                     | $0.708^{+0.015}_{-0.016}$       | $100\theta_D$               | $0.16053^{+0.00040}_{-0.00038}$ | $\chi_{\text{H073p45}}^2$   | $6.9 (\nu: 2.2)$             |
| $\Omega_m$                           | $0.292^{+0.016}_{-0.015}$       | $z_{\text{eq}}$             | $3317^{+62}_{-57}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.7)$             |
| $\Omega_m h^2$                       | $0.1395^{+0.0026}_{-0.0024}$    | $k_{\text{eq}}$             | $0.01012^{+0.00019}_{-0.00017}$ | $\chi_{\text{CMB}}^2$       | $11932.1 (\nu: 17.5)$        |
| $\Omega_m h^3$                       | $0.09640^{+0.00069}_{-0.00064}$ | $100\theta_{\text{eq}}$     | $0.830^{+0.011}_{-0.012}$       |                             |                              |
| $\sigma_8$                           | $0.795^{+0.015}_{-0.013}$       | $100\theta_{s,\text{eq}}$   | $0.4579^{+0.0057}_{-0.0062}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11946.84; \Delta\bar{\chi}_{\text{eff}}^2 = -7.17; R - 1 = 0.04629$$



### 3.13 base\_Alens\_CamSpecHM\_TE\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02233  | $0.02238^{+0.00078}_{-0.00076}$ | $D_{40}$              | 1216     | $1209^{+76}_{-74}$              | $D_M(0.15)$        | 635.9    | $634^{+21}_{-20}$            |
| $\Omega_c h^2$              | 0.1177   | $0.1174^{+0.0051}_{-0.0050}$    | $D_{220}$             | 5715     | $5710^{+120}_{-120}$            | $H(0.38)$          | 83.37    | $83.5^{+1.7}_{-1.6}$         |
| $100\theta_{MC}$            | 1.04130  | $1.0414^{+0.0010}_{-0.0010}$    | $D_{810}$             | 2532     | $2536^{+80}_{-77}$              | $D_M(0.38)$        | 1518.8   | $1516^{+42}_{-42}$           |
| $\tau$                      | 0.0504   | $0.050^{+0.017}_{-0.018}$       | $D_{1420}$            | 816.5    | $819^{+40}_{-38}$               | $H(0.51)$          | 89.99    | $90.1^{+1.4}_{-1.3}$         |
| $A_L$                       | 0.890    | $0.93^{+0.46}_{-0.42}$          | $D_{2000}$            | 229.3    | $231^{+18}_{-17}$               | $D_M(0.51)$        | 1968.9   | $1965^{+50}_{-49}$           |
| $\ln(10^{10} A_s)$          | 3.0276   | $3.027^{+0.046}_{-0.045}$       | $n_{s,0.002}$         | 0.9689   | $0.973^{+0.041}_{-0.040}$       | $H(0.61)$          | 95.53    | $95.6^{+1.1}_{-1.1}$         |
| $n_s$                       | 0.9689   | $0.973^{+0.041}_{-0.040}$       | $Y_P$                 | 0.245379 | $0.24539^{+0.00033}_{-0.00034}$ | $D_M(0.61)$        | 2292     | $2288^{+54}_{-54}$           |
| $y_{cal}$                   | 1.00006  | $0.99997^{+0.0050}_{-0.0049}$   | $Y_P^{BBN}$           | 0.246705 | $0.24672^{+0.00034}_{-0.00034}$ | $H(2.33)$          | 235.07   | $234.9^{+2.9}_{-2.8}$        |
| $H_0$                       | 68.25    | $68.4^{+2.5}_{-2.4}$            | $10^5 D/H$            | 2.593    | $2.59^{+0.14}_{-0.14}$          | $D_M(2.33)$        | 5755     | $5751^{+49}_{-51}$           |
| $\Omega_\Lambda$            | 0.6979   | $0.700^{+0.030}_{-0.032}$       | Age/Gyr               | 13.780   | $13.77^{+0.11}_{-0.11}$         | $f\sigma_8(0.15)$  | 0.4442   | $0.443^{+0.027}_{-0.027}$    |
| $\Omega_m$                  | 0.3021   | $0.300^{+0.032}_{-0.030}$       | $z_*$                 | 1089.77  | $1089.7^{+1.3}_{-1.3}$          | $\sigma_8(0.15)$   | 0.7388   | $0.739^{+0.021}_{-0.021}$    |
| $\Omega_m h^2$              | 0.14072  | $0.1404^{+0.0046}_{-0.0046}$    | $r_*$                 | 145.05   | $145.1^{+1.0}_{-1.0}$           | $f\sigma_8(0.38)$  | 0.4643   | $0.463^{+0.021}_{-0.022}$    |
| $\Omega_m h^3$              | 0.09604  | $0.0961^{+0.0013}_{-0.0012}$    | $100\theta_*$         | 1.04150  | $1.0416^{+0.0010}_{-0.0010}$    | $\sigma_8(0.38)$   | 0.6560   | $0.656^{+0.019}_{-0.018}$    |
| $\sigma_8$                  | 0.7986   | $0.798^{+0.024}_{-0.024}$       | $D_M(z_*)/\text{Gpc}$ | 13.927   | $13.931^{+0.097}_{-0.094}$      | $f\sigma_8(0.51)$  | 0.4640   | $0.463^{+0.019}_{-0.019}$    |
| $S_8$                       | 0.801    | $0.798^{+0.053}_{-0.053}$       | $z_{drag}$            | 1059.67  | $1059.8^{+1.6}_{-1.6}$          | $\sigma_8(0.51)$   | 0.6143   | $0.614^{+0.018}_{-0.017}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4389   | $0.437^{+0.029}_{-0.029}$       | $r_{drag}$            | 147.74   | $147.8^{+1.0}_{-1.0}$           | $f\sigma_8(0.61)$  | 0.4599   | $0.459^{+0.017}_{-0.018}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.5920   | $0.591^{+0.026}_{-0.027}$       | $k_D$                 | 0.14016  | $0.1402^{+0.0012}_{-0.0012}$    | $\sigma_8(0.61)$   | 0.5848   | $0.585^{+0.017}_{-0.016}$    |
| $\sigma_8/h^{0.5}$          | 0.9666   | $0.965^{+0.036}_{-0.037}$       | $100\theta_D$         | 0.16095  | $0.16091^{+0.00093}_{-0.00089}$ | $f\sigma_8(2.33)$  | 0.2952   | $0.2954^{+0.0091}_{-0.0085}$ |
| $r_{drag} h$                | 100.83   | $101.1^{+4.1}_{-4.0}$           | $z_{eq}$              | 3347     | $3341^{+110}_{-110}$            | $\sigma_8(2.33)$   | 0.3048   | $0.3051^{+0.0099}_{-0.0092}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.259    | $2.28^{+0.47}_{-0.49}$          | $k_{eq}$              | 0.010216 | $0.01020^{+0.00034}_{-0.00033}$ | $\chi_{small}^2$   | 395.66   | $396.9 (\nu: 1.5)$           |
| $z_{re}$                    | 7.25     | $7.2^{+1.8}_{-1.8}$             | $100\theta_{eq}$      | 0.8234   | $0.825^{+0.022}_{-0.022}$       | $\chi_{CamSpec}^2$ | 2575.8   | $2581.9 (\nu: 6.2)$          |
| $10^9 A_s$                  | 2.065    | $2.064^{+0.096}_{-0.092}$       | $100\theta_{s,eq}$    | 0.4547   | $0.455^{+0.011}_{-0.011}$       | $\chi_{prior}^2$   | 10.03    | $11.0 (\nu: 1.0)$            |
| $10^9 A_s e^{-2\tau}$       | 1.8667   | $1.867^{+0.049}_{-0.048}$       | $H(0.15)$             | 73.43    | $73.6^{+2.2}_{-2.1}$            | $\chi_{CMB}^2$     | 2971.5   | $2978.8 (\nu: 7.6)$          |

Best-fit  $\chi_{eff}^2 = 2981.49$ ;  $\Delta\chi_{eff}^2 = -0.15$ ;  $\bar{\chi}_{eff}^2 = 2989.81$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.90$ ;  $R - 1 = 0.00461$

$\chi_{eff}^2$ : CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.66 ( $\Delta$  -0.01) CamSpec like\_10.7HM\_1400\_unified: 2575.80 ( $\Delta$  -0.15)



### 3.14 base\_Alens\_CamSpecHM\_TE\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$             | $0.02230^{+0.00062}_{-0.00061}$ | $D_{810}$                          | $2530^{+72}_{-71}$              | $D_{\mathrm{M}}(0.51)$      | $1972^{+26}_{-26}$           |
| $\Omega_{\mathrm{c}}h^2$             | $0.1181^{+0.0025}_{-0.0026}$    | $D_{1420}$                         | $816^{+35}_{-33}$               | $H(0.61)$                   | $95.48^{+0.65}_{-0.63}$      |
| $100\theta_{\mathrm{MC}}$            | $1.04130^{+0.00096}_{-0.00092}$ | $D_{2000}$                         | $229^{+16}_{-15}$               | $D_{\mathrm{M}}(0.61)$      | $2295^{+28}_{-28}$           |
| $\tau$                               | $0.050^{+0.018}_{-0.018}$       | $n_{\mathrm{s},0.002}$             | $0.968^{+0.032}_{-0.030}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.6}$        |
| $A_{\mathrm{L}}$                     | $0.89^{+0.37}_{-0.36}$          | $Y_{\mathrm{P}}$                   | $0.24536^{+0.00025}_{-0.00028}$ | $D_{\mathrm{M}}(2.33)$      | $5757^{+32}_{-33}$           |
| $\ln(10^{10}A_{\mathrm{s}})$         | $3.026^{+0.045}_{-0.044}$       | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24669^{+0.00025}_{-0.00028}$ | $f\sigma_8(0.15)$           | $0.446^{+0.017}_{-0.017}$    |
| $n_{\mathrm{s}}$                     | $0.968^{+0.032}_{-0.030}$       | $10^5\mathrm{D}/\mathrm{H}$        | $2.60^{+0.12}_{-0.11}$          | $\sigma_8(0.15)$            | $0.739^{+0.021}_{-0.020}$    |
| $y_{\mathrm{cal}}$                   | $1.0000^{+0.0050}_{-0.0049}$    | Age/Gyr                            | $13.785^{+0.074}_{-0.075}$      | $f\sigma_8(0.38)$           | $0.465^{+0.016}_{-0.015}$    |
| $H_0$                                | $68.1^{+1.3}_{-1.2}$            | $z_*$                              | $1089.85^{+0.88}_{-0.86}$       | $\sigma_8(0.38)$            | $0.656^{+0.019}_{-0.018}$    |
| $\Omega_{\Lambda}$                   | $0.696^{+0.015}_{-0.016}$       | $r_*$                              | $144.99^{+0.69}_{-0.68}$        | $f\sigma_8(0.51)$           | $0.465^{+0.015}_{-0.014}$    |
| $\Omega_{\mathrm{m}}$                | $0.304^{+0.016}_{-0.015}$       | $100\theta_*$                      | $1.04149^{+0.00095}_{-0.00092}$ | $\sigma_8(0.51)$            | $0.614^{+0.018}_{-0.017}$    |
| $\Omega_{\mathrm{m}}h^2$             | $0.1410^{+0.0024}_{-0.0024}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.921^{+0.068}_{-0.067}$      | $f\sigma_8(0.61)$           | $0.460^{+0.014}_{-0.014}$    |
| $\Omega_{\mathrm{m}}h^3$             | $0.0960^{+0.0012}_{-0.0012}$    | $z_{\mathrm{drag}}$                | $1059.6^{+1.4}_{-1.4}$          | $\sigma_8(0.61)$            | $0.585^{+0.017}_{-0.016}$    |
| $\sigma_8$                           | $0.799^{+0.023}_{-0.022}$       | $r_{\mathrm{drag}}$                | $147.69^{+0.80}_{-0.79}$        | $f\sigma_8(2.33)$           | $0.2950^{+0.0088}_{-0.0082}$ |
| $S_8$                                | $0.804^{+0.033}_{-0.032}$       | $k_{\mathrm{D}}$                   | $0.1402^{+0.0012}_{-0.0012}$    | $\sigma_8(2.33)$            | $0.3045^{+0.0093}_{-0.0085}$ |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.441^{+0.018}_{-0.017}$       | $100\theta_{\mathrm{D}}$           | $0.16098^{+0.00084}_{-0.00080}$ | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.593^{+0.020}_{-0.018}$       | $z_{\mathrm{eq}}$                  | $3354^{+58}_{-58}$              | $\chi_{\mathrm{CamSpec}}^2$ | $2581.1 (\nu: 5.4)$          |
| $\sigma_8/h^{0.5}$                   | $0.968^{+0.029}_{-0.028}$       | $k_{\mathrm{eq}}$                  | $0.01024^{+0.00018}_{-0.00018}$ | $\chi_{6\mathrm{DF}}^2$     | $0.044 (\nu: 0.0)$           |
| $r_{\mathrm{drag}}h$                 | $100.6^{+2.0}_{-2.0}$           | $100\theta_{\mathrm{eq}}$          | $0.822^{+0.011}_{-0.011}$       | $\chi_{\mathrm{MGS}}^2$     | $1.84 (\nu: 0.2)$            |
| $\langle d^2 \rangle^{1/2}$          | $2.24^{+0.43}_{-0.46}$          | $100\theta_{\mathrm{s,eq}}$        | $0.4540^{+0.0057}_{-0.0056}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.1 (\nu: 0.5)$             |
| $z_{\mathrm{re}}$                    | $7.2^{+1.8}_{-1.8}$             | $H(0.15)$                          | $73.3^{+1.1}_{-1.1}$            | $\chi_{\mathrm{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_{\mathrm{s}}$                | $2.061^{+0.095}_{-0.090}$       | $D_{\mathrm{M}}(0.15)$             | $637^{+11}_{-11}$               | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.6)$             |
| $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.866^{+0.048}_{-0.048}$       | $H(0.38)$                          | $83.28^{+0.87}_{-0.84}$         | $\chi_{\mathrm{CMB}}^2$     | $2978.0 (\nu: 6.7)$          |
| $D_{40}$                             | $1217^{+61}_{-59}$              | $D_{\mathrm{M}}(0.38)$             | $1521^{+22}_{-22}$              |                             |                              |
| $D_{220}$                            | $5707^{+120}_{-120}$            | $H(0.51)$                          | $89.92^{+0.74}_{-0.72}$         |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 2995.04$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.94$ ;  $R - 1 = 0.00758$



### 3.15 base\_Alens\_CamSpecHM\_TE\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$             | $0.02239^{+0.00078}_{-0.00077}$ | $D_{40}$                           | $1209^{+76}_{-74}$              | $D_{\mathrm{M}}(0.15)$      | $634^{+21}_{-20}$            |
| $\Omega_{\mathrm{c}}h^2$             | $0.1173^{+0.0051}_{-0.0050}$    | $D_{220}$                          | $5709^{+120}_{-120}$            | $H(0.38)$                   | $83.5^{+1.6}_{-1.6}$         |
| $100\theta_{\mathrm{MC}}$            | $1.0414^{+0.0010}_{-0.0010}$    | $D_{810}$                          | $2536^{+80}_{-78}$              | $D_{\mathrm{M}}(0.38)$      | $1515^{+43}_{-41}$           |
| $\tau$                               | $0.053^{+0.013}_{-0.011}$       | $D_{1420}$                         | $819^{+40}_{-38}$               | $H(0.51)$                   | $90.1^{+1.3}_{-1.3}$         |
| $A_{\mathrm{L}}$                     | $0.93^{+0.45}_{-0.42}$          | $D_{2000}$                         | $231^{+18}_{-17}$               | $D_{\mathrm{M}}(0.51)$      | $1965^{+50}_{-49}$           |
| $\ln(10^{10}A_{\mathrm{s}})$         | $3.034^{+0.041}_{-0.036}$       | $n_{\mathrm{s},0.002}$             | $0.973^{+0.041}_{-0.040}$       | $H(0.61)$                   | $95.6^{+1.1}_{-1.1}$         |
| $n_{\mathrm{s}}$                     | $0.973^{+0.041}_{-0.040}$       | $Y_{\mathrm{P}}$                   | $0.24539^{+0.00034}_{-0.00035}$ | $D_{\mathrm{M}}(0.61)$      | $2288^{+54}_{-53}$           |
| $y_{\mathrm{cal}}$                   | $0.99995^{+0.0049}_{-0.0049}$   | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24672^{+0.00034}_{-0.00035}$ | $H(2.33)$                   | $234.9^{+2.9}_{-2.8}$        |
| $H_0$                                | $68.5^{+2.5}_{-2.5}$            | $10^5D/\mathrm{H}$                 | $2.58^{+0.15}_{-0.14}$          | $D_{\mathrm{M}}(2.33)$      | $5750^{+50}_{-51}$           |
| $\Omega_{\Lambda}$                   | $0.700^{+0.030}_{-0.033}$       | Age/Gyr                            | $13.77^{+0.11}_{-0.11}$         | $f\sigma_8(0.15)$           | $0.444^{+0.027}_{-0.026}$    |
| $\Omega_{\mathrm{m}}$                | $0.300^{+0.033}_{-0.030}$       | $z_*$                              | $1089.7^{+1.3}_{-1.3}$          | $\sigma_8(0.15)$            | $0.741^{+0.020}_{-0.019}$    |
| $\Omega_{\mathrm{m}}h^2$             | $0.1404^{+0.0046}_{-0.0045}$    | $r_*$                              | $145.1^{+1.0}_{-1.0}$           | $f\sigma_8(0.38)$           | $0.464^{+0.021}_{-0.021}$    |
| $\Omega_{\mathrm{m}}h^3$             | $0.0961^{+0.0013}_{-0.0012}$    | $100\theta_*$                      | $1.0416^{+0.0010}_{-0.0010}$    | $\sigma_8(0.38)$            | $0.658^{+0.018}_{-0.016}$    |
| $\sigma_8$                           | $0.801^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.932^{+0.096}_{-0.094}$      | $f\sigma_8(0.51)$           | $0.464^{+0.018}_{-0.018}$    |
| $S_8$                                | $0.800^{+0.053}_{-0.052}$       | $z_{\mathrm{drag}}$                | $1059.8^{+1.6}_{-1.6}$          | $\sigma_8(0.51)$            | $0.616^{+0.017}_{-0.015}$    |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.438^{+0.029}_{-0.028}$       | $r_{\mathrm{drag}}$                | $147.8^{+1.0}_{-0.99}$          | $f\sigma_8(0.61)$           | $0.460^{+0.016}_{-0.016}$    |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.592^{+0.025}_{-0.025}$       | $k_{\mathrm{D}}$                   | $0.1401^{+0.0012}_{-0.0012}$    | $\sigma_8(0.61)$            | $0.587^{+0.016}_{-0.015}$    |
| $\sigma_8/h^{0.5}$                   | $0.968^{+0.035}_{-0.035}$       | $100\theta_{\mathrm{D}}$           | $0.16090^{+0.00094}_{-0.00090}$ | $f\sigma_8(2.33)$           | $0.2964^{+0.0083}_{-0.0080}$ |
| $r_{\mathrm{drag}}h$                 | $101.2^{+4.1}_{-4.1}$           | $z_{\mathrm{eq}}$                  | $3339^{+110}_{-110}$            | $\sigma_8(2.33)$            | $0.3061^{+0.0093}_{-0.0086}$ |
| $\langle d^2 \rangle^{1/2}$          | $2.28^{+0.48}_{-0.50}$          | $k_{\mathrm{eq}}$                  | $0.01019^{+0.00034}_{-0.00033}$ | $\chi_{\mathrm{simall}}^2$  | $396.5 (\nu: 0.9)$           |
| $z_{\mathrm{re}}$                    | $< 8.68$                        | $100\theta_{\mathrm{eq}}$          | $0.825^{+0.022}_{-0.022}$       | $\chi_{\mathrm{CamSpec}}^2$ | $2581.9 (\nu: 6.2)$          |
| $10^9A_{\mathrm{s}}$                 | $2.078^{+0.083}_{-0.078}$       | $100\theta_{\mathrm{s,eq}}$        | $0.456^{+0.011}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9A_{\mathrm{s}}e^{-2\tau}$       | $1.868^{+0.049}_{-0.049}$       | $H(0.15)$                          | $73.6^{+2.2}_{-2.1}$            | $\chi_{\mathrm{CMB}}^2$     | $2978.4 (\nu: 7.1)$          |

$$\bar{\chi}_{\mathrm{eff}}^2 = 2989.43; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.91; R - 1 = 0.00501$$



### 3.16 base\_Alens\_CamSpecHM\_TE\_lowE\_post\_BAO\_zre6p5

| Parameter                   | 95% limits                      | Parameter             | 95% limits                      | Parameter          | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------|---------------------------------|--------------------|------------------------------|
| $\Omega_b h^2$              | $0.02230^{+0.00063}_{-0.00063}$ | $D_{810}$             | $2531^{+73}_{-72}$              | $D_M(0.51)$        | $1972^{+26}_{-26}$           |
| $\Omega_c h^2$              | $0.1180^{+0.0025}_{-0.0026}$    | $D_{1420}$            | $816^{+35}_{-33}$               | $H(0.61)$          | $95.48^{+0.65}_{-0.63}$      |
| $100\theta_{MC}$            | $1.04130^{+0.00096}_{-0.00092}$ | $D_{2000}$            | $229^{+16}_{-15}$               | $D_M(0.61)$        | $2295^{+28}_{-29}$           |
| $\tau$                      | $0.053^{+0.013}_{-0.010}$       | $n_{s,0.002}$         | $0.969^{+0.032}_{-0.032}$       | $H(2.33)$          | $235.2^{+1.6}_{-1.6}$        |
| $A_L$                       | $0.88^{+0.37}_{-0.37}$          | $Y_P$                 | $0.24536^{+0.00025}_{-0.00029}$ | $D_M(2.33)$        | $5757^{+33}_{-33}$           |
| $\ln(10^{10} A_s)$          | $3.032^{+0.041}_{-0.036}$       | $Y_P^{BBN}$           | $0.24669^{+0.00025}_{-0.00029}$ | $f\sigma_8(0.15)$  | $0.447^{+0.017}_{-0.016}$    |
| $n_s$                       | $0.969^{+0.032}_{-0.032}$       | $10^5 D/H$            | $2.60^{+0.12}_{-0.11}$          | $\sigma_8(0.15)$   | $0.741^{+0.020}_{-0.018}$    |
| $y_{cal}$                   | $1.0000^{+0.0050}_{-0.0049}$    | Age/Gyr               | $13.785^{+0.075}_{-0.075}$      | $f\sigma_8(0.38)$  | $0.467^{+0.015}_{-0.014}$    |
| $H_0$                       | $68.1^{+1.3}_{-1.2}$            | $z_*$                 | $1089.84^{+0.89}_{-0.86}$       | $\sigma_8(0.38)$   | $0.658^{+0.018}_{-0.016}$    |
| $\Omega_\Lambda$            | $0.696^{+0.015}_{-0.016}$       | $r_*$                 | $144.99^{+0.69}_{-0.67}$        | $f\sigma_8(0.51)$  | $0.466^{+0.014}_{-0.013}$    |
| $\Omega_m$                  | $0.304^{+0.016}_{-0.015}$       | $100\theta_*$         | $1.04149^{+0.00095}_{-0.00091}$ | $\sigma_8(0.51)$   | $0.616^{+0.017}_{-0.015}$    |
| $\Omega_m h^2$              | $0.1410^{+0.0024}_{-0.0024}$    | $D_M(z_*)/\text{Gpc}$ | $13.922^{+0.068}_{-0.067}$      | $f\sigma_8(0.61)$  | $0.462^{+0.013}_{-0.013}$    |
| $\Omega_m h^3$              | $0.0960^{+0.0012}_{-0.0012}$    | $z_{drag}$            | $1059.6^{+1.4}_{-1.4}$          | $\sigma_8(0.61)$   | $0.586^{+0.016}_{-0.014}$    |
| $\sigma_8$                  | $0.802^{+0.021}_{-0.020}$       | $r_{drag}$            | $147.69^{+0.80}_{-0.78}$        | $f\sigma_8(2.33)$  | $0.2960^{+0.0080}_{-0.0077}$ |
| $S_8$                       | $0.807^{+0.032}_{-0.030}$       | $k_D$                 | $0.1402^{+0.0012}_{-0.0012}$    | $\sigma_8(2.33)$   | $0.3055^{+0.0087}_{-0.0078}$ |
| $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.017}_{-0.017}$       | $100\theta_D$         | $0.16098^{+0.00086}_{-0.00081}$ | $\chi_{simall}^2$  | $396.5 (\nu: 1.0)$           |
| $\sigma_8 \Omega_m^{0.25}$  | $0.595^{+0.019}_{-0.017}$       | $z_{eq}$              | $3354^{+58}_{-58}$              | $\chi_{CamSpec}^2$ | $2581.2 (\nu: 5.4)$          |
| $\sigma_8/h^{0.5}$          | $0.971^{+0.028}_{-0.026}$       | $k_{eq}$              | $0.01024^{+0.00018}_{-0.00018}$ | $\chi_{6DF}^2$     | $0.044 (\nu: 0.0)$           |
| $r_{drag} h$                | $100.6^{+2.0}_{-2.0}$           | $100\theta_{eq}$      | $0.822^{+0.011}_{-0.011}$       | $\chi_{MGS}^2$     | $1.85 (\nu: 0.2)$            |
| $\langle d^2 \rangle^{1/2}$ | $2.24^{+0.44}_{-0.47}$          | $100\theta_{s,eq}$    | $0.4541^{+0.0057}_{-0.0056}$    | $\chi_{DR12BAO}^2$ | $4.1 (\nu: 0.5)$             |
| $z_{re}$                    | $< 8.72$                        | $H(0.15)$             | $73.3^{+1.1}_{-1.1}$            | $\chi_{prior}^2$   | $11.0 (\nu: 1.1)$            |
| $10^9 A_s$                  | $2.075^{+0.083}_{-0.077}$       | $D_M(0.15)$           | $637^{+11}_{-11}$               | $\chi_{BAO}^2$     | $6.0 (\nu: 0.6)$             |
| $10^9 A_s e^{-2\tau}$       | $1.866^{+0.050}_{-0.048}$       | $H(0.38)$             | $83.29^{+0.87}_{-0.84}$         | $\chi_{CMB}^2$     | $2977.7 (\nu: 6.3)$          |
| $D_{40}$                    | $1217^{+61}_{-59}$              | $D_M(0.38)$           | $1521^{+22}_{-22}$              |                    |                              |
| $D_{220}$                   | $5707^{+120}_{-120}$            | $H(0.51)$             | $89.92^{+0.74}_{-0.72}$         |                    |                              |

$\bar{\chi}_{eff}^2 = 2994.70$ ;  $\Delta\bar{\chi}_{eff}^2 = 1.00$ ;  $R - 1 = 0.00997$



### 3.17 base\_Alens\_CamSpecHM\_EE\_lowE

| Parameter                   | Best fit | 95% limits                   | Parameter             | Best fit | 95% limits                      | Parameter          | Best fit | 95% limits                   |
|-----------------------------|----------|------------------------------|-----------------------|----------|---------------------------------|--------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02349  | $0.0236^{+0.0025}_{-0.0024}$ | $D_{40}$              | 1258     | $1257^{+62}_{-60}$              | $D_M(0.15)$        | 633.9    | $632^{+48}_{-45}$            |
| $\Omega_c h^2$              | 0.1180   | $0.118^{+0.010}_{-0.0094}$   | $D_{220}$             | 5982     | $5998^{+400}_{-400}$            | $H(0.38)$          | 83.67    | $83.9^{+4.0}_{-3.7}$         |
| $100\theta_{MC}$            | 1.03926  | $1.0393^{+0.0017}_{-0.0017}$ | $D_{810}$             | 2600     | $2601^{+75}_{-77}$              | $D_M(0.38)$        | 1514     | $1510^{+98}_{-94}$           |
| $\tau$                      | 0.0509   | $0.051^{+0.017}_{-0.018}$    | $D_{1420}$            | 841.1    | $842^{+36}_{-37}$               | $H(0.51)$          | 90.32    | $90.6^{+3.3}_{-3.2}$         |
| $A_L$                       | 1.136    | $1.16^{+0.50}_{-0.45}$       | $D_{2000}$            | 240.9    | $242^{+15}_{-16}$               | $D_M(0.51)$        | 1962     | $1957^{+120}_{-110}$         |
| $\ln(10^{10} A_s)$          | 3.0595   | $3.059^{+0.042}_{-0.044}$    | $n_{s,0.002}$         | 0.9702   | $0.972^{+0.030}_{-0.029}$       | $H(0.61)$          | 95.90    | $96.1^{+2.9}_{-2.8}$         |
| $n_s$                       | 0.9702   | $0.972^{+0.030}_{-0.029}$    | $Y_P$                 | 0.24586  | $0.24589^{+0.00097}_{-0.0010}$  | $D_M(0.61)$        | 2285     | $2279^{+130}_{-120}$         |
| $y_{cal}$                   | 1.00002  | $0.9999^{+0.0049}_{-0.0049}$ | $Y_P^{BBN}$           | 0.24719  | $0.24722^{+0.00097}_{-0.0010}$  | $H(2.33)$          | 236.17   | $236.2^{+4.7}_{-4.1}$        |
| $H_0$                       | 68.4     | $68.7^{+5.6}_{-5.5}$         | $10^5 D/H$            | 2.390    | $2.38^{+0.43}_{-0.38}$          | $D_M(2.33)$        | 5732     | $5723^{+130}_{-140}$         |
| $\Omega_\Lambda$            | 0.697    | $0.697^{+0.062}_{-0.067}$    | Age/Gyr               | 13.725   | $13.71^{+0.29}_{-0.31}$         | $f\sigma_8(0.15)$  | 0.449    | $0.447^{+0.063}_{-0.058}$    |
| $\Omega_m$                  | 0.303    | $0.303^{+0.067}_{-0.062}$    | $z_*$                 | 1088.40  | $1088.3^{+3.7}_{-3.3}$          | $\sigma_8(0.15)$   | 0.7453   | $0.743^{+0.028}_{-0.030}$    |
| $\Omega_m h^2$              | 0.1421   | $0.1420^{+0.0082}_{-0.0074}$ | $r_*$                 | 144.10   | $144.1^{+1.3}_{-1.3}$           | $f\sigma_8(0.38)$  | 0.4690   | $0.467^{+0.048}_{-0.047}$    |
| $\Omega_m h^3$              | 0.09726  | $0.0975^{+0.0037}_{-0.0034}$ | $100\theta_*$         | 1.03933  | $1.0394^{+0.0016}_{-0.0016}$    | $\sigma_8(0.38)$   | 0.6616   | $0.660^{+0.019}_{-0.021}$    |
| $\sigma_8$                  | 0.8057   | $0.804^{+0.036}_{-0.038}$    | $D_M(z_*)/\text{Gpc}$ | 13.865   | $13.86^{+0.12}_{-0.13}$         | $f\sigma_8(0.51)$  | 0.4685   | $0.466^{+0.040}_{-0.040}$    |
| $S_8$                       | 0.810    | $0.81^{+0.13}_{-0.11}$       | $z_{drag}$            | 1062.34  | $1062.6^{+4.9}_{-4.9}$          | $\sigma_8(0.51)$   | 0.6195   | $0.618^{+0.016}_{-0.018}$    |
| $\sigma_8 \Omega_m^{0.5}$   | 0.444    | $0.442^{+0.069}_{-0.062}$    | $r_{drag}$            | 146.40   | $146.3^{+1.4}_{-1.4}$           | $f\sigma_8(0.61)$  | 0.4643   | $0.462^{+0.034}_{-0.036}$    |
| $\sigma_8 \Omega_m^{0.25}$  | 0.598    | $0.596^{+0.059}_{-0.055}$    | $k_D$                 | 0.14241  | $0.1425^{+0.0026}_{-0.0026}$    | $\sigma_8(0.61)$   | 0.5897   | $0.589^{+0.015}_{-0.016}$    |
| $\sigma_8/h^{0.5}$          | 0.974    | $0.970^{+0.082}_{-0.079}$    | $100\theta_D$         | 0.15911  | $0.1590^{+0.0027}_{-0.0026}$    | $f\sigma_8(2.33)$  | 0.2977   | $0.2972^{+0.0069}_{-0.0071}$ |
| $r_{drag} h$                | 100.2    | $100.6^{+8.2}_{-8.2}$        | $z_{eq}$              | 3380     | $3377^{+200}_{-180}$            | $\sigma_8(2.33)$   | 0.3072   | $0.3070^{+0.0073}_{-0.0074}$ |
| $\langle d^2 \rangle^{1/2}$ | 2.590    | $2.60^{+0.46}_{-0.51}$       | $k_{eq}$              | 0.01032  | $0.01031^{+0.00060}_{-0.00054}$ | $\chi_{simall}^2$  | 395.60   | $396.8 (\nu: 1.3)$           |
| $z_{re}$                    | 7.07     | $7.0^{+1.8}_{-1.7}$          | $100\theta_{eq}$      | 0.8191   | $0.821^{+0.040}_{-0.040}$       | $\chi_{CamSpec}^2$ | 1886.1   | $1892.2 (\nu: 6.2)$          |
| $10^9 A_s$                  | 2.132    | $2.132^{+0.091}_{-0.092}$    | $100\theta_{s,eq}$    | 0.4515   | $0.452^{+0.019}_{-0.019}$       | $\chi_{prior}^2$   | 10.03    | $11.0 (\nu: 1.0)$            |
| $10^9 A_s e^{-2\tau}$       | 1.9254   | $1.927^{+0.050}_{-0.048}$    | $H(0.15)$             | 73.66    | $73.9^{+5.0}_{-4.8}$            | $\chi_{CMB}^2$     | 2281.7   | $2289.0 (\nu: 7.4)$          |

Best-fit  $\chi_{eff}^2 = 2291.75$ ;  $\Delta\chi_{eff}^2 = -0.42$ ;  $\bar{\chi}_{eff}^2 = 2300.05$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.70$ ;  $R - 1 = 0.00814$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.60 ( $\Delta$  -0.02) CamSpec like\_10.7HM\_1400\_unified: 1886.12 ( $\Delta$  -0.39)



### 3.18 base\_Alens\_CamSpecHM\_EE\_lowE\_post\_BAO

| Parameter                   | 95% limits                    | Parameter             | 95% limits                      | Parameter          | 95% limits                   |
|-----------------------------|-------------------------------|-----------------------|---------------------------------|--------------------|------------------------------|
| $\Omega_b h^2$              | $0.0236^{+0.0013}_{-0.0013}$  | $D_{810}$             | $2601^{+65}_{-64}$              | $D_M(0.51)$        | $1956^{+35}_{-36}$           |
| $\Omega_c h^2$              | $0.1175^{+0.0030}_{-0.0028}$  | $D_{1420}$            | $842^{+28}_{-29}$               | $H(0.61)$          | $96.1^{+1.1}_{-1.1}$         |
| $100\theta_{MC}$            | $1.0394^{+0.0015}_{-0.0016}$  | $D_{2000}$            | $242^{+11}_{-11}$               | $D_M(0.61)$        | $2278^{+39}_{-40}$           |
| $\tau$                      | $0.051^{+0.017}_{-0.018}$     | $n_s, 0.002$          | $0.972^{+0.020}_{-0.020}$       | $H(2.33)$          | $236.0^{+2.1}_{-2.0}$        |
| $A_L$                       | $1.16^{+0.46}_{-0.41}$        | $Y_P$                 | $0.24589^{+0.00051}_{-0.00053}$ | $D_M(2.33)$        | $5725^{+58}_{-58}$           |
| $\ln(10^{10} A_s)$          | $3.059^{+0.042}_{-0.043}$     | $Y_P^{BBN}$           | $0.24722^{+0.00051}_{-0.00053}$ | $f\sigma_8(0.15)$  | $0.446^{+0.020}_{-0.020}$    |
| $n_s$                       | $0.972^{+0.020}_{-0.020}$     | $10^5 D/H$            | $2.37^{+0.23}_{-0.21}$          | $\sigma_8(0.15)$   | $0.744^{+0.018}_{-0.019}$    |
| $y_{cal}$                   | $0.99996^{+0.0048}_{-0.0048}$ | Age/Gyr               | $13.71^{+0.13}_{-0.13}$         | $f\sigma_8(0.38)$  | $0.466^{+0.017}_{-0.017}$    |
| $H_0$                       | $68.8^{+1.7}_{-1.6}$          | $z_*$                 | $1088.3^{+1.6}_{-1.5}$          | $\sigma_8(0.38)$   | $0.661^{+0.015}_{-0.016}$    |
| $\Omega_\Lambda$            | $0.700^{+0.017}_{-0.018}$     | $r_*$                 | $144.1^{+1.1}_{-1.1}$           | $f\sigma_8(0.51)$  | $0.466^{+0.015}_{-0.015}$    |
| $\Omega_m$                  | $0.300^{+0.018}_{-0.017}$     | $100\theta_*$         | $1.0394^{+0.0015}_{-0.0016}$    | $\sigma_8(0.51)$   | $0.619^{+0.014}_{-0.015}$    |
| $\Omega_m h^2$              | $0.1417^{+0.0029}_{-0.0028}$  | $D_M(z_*)/\text{Gpc}$ | $13.87^{+0.10}_{-0.11}$         | $f\sigma_8(0.61)$  | $0.462^{+0.014}_{-0.014}$    |
| $\Omega_m h^3$              | $0.0974^{+0.0024}_{-0.0023}$  | $z_{drag}$            | $1062.5^{+2.8}_{-2.8}$          | $\sigma_8(0.61)$   | $0.589^{+0.013}_{-0.014}$    |
| $\sigma_8$                  | $0.804^{+0.020}_{-0.021}$     | $r_{drag}$            | $146.4^{+1.4}_{-1.4}$           | $f\sigma_8(2.33)$  | $0.2975^{+0.0068}_{-0.0070}$ |
| $S_8$                       | $0.804^{+0.038}_{-0.038}$     | $k_D$                 | $0.1425^{+0.0022}_{-0.0023}$    | $\sigma_8(2.33)$   | $0.3073^{+0.0070}_{-0.0073}$ |
| $\sigma_8 \Omega_m^{0.5}$   | $0.440^{+0.021}_{-0.021}$     | $100\theta_D$         | $0.1590^{+0.0017}_{-0.0016}$    | $\chi_{simall}^2$  | $396.8 (\nu: 1.4)$           |
| $\sigma_8 \Omega_m^{0.25}$  | $0.595^{+0.021}_{-0.020}$     | $z_{eq}$              | $3371^{+70}_{-66}$              | $\chi_{CamSpec}^2$ | $1891.3 (\nu: 5.1)$          |
| $\sigma_8/h^{0.5}$          | $0.970^{+0.030}_{-0.031}$     | $k_{eq}$              | $0.01029^{+0.00021}_{-0.00020}$ | $\chi_{6DF}^2$     | $0.057 (\nu: 0.0)$           |
| $r_{drag} h$                | $100.7^{+2.3}_{-2.3}$         | $100\theta_{eq}$      | $0.821^{+0.012}_{-0.012}$       | $\chi_{MGS}^2$     | $1.85 (\nu: 0.3)$            |
| $\langle d^2 \rangle^{1/2}$ | $2.59^{+0.47}_{-0.50}$        | $100\theta_{s,eq}$    | $0.4525^{+0.0062}_{-0.0063}$    | $\chi_{DR12BAO}^2$ | $4.6 (\nu: 0.9)$             |
| $z_{re}$                    | $7.0^{+1.7}_{-1.9}$           | $H(0.15)$             | $73.9^{+1.5}_{-1.5}$            | $\chi_{prior}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_s$                  | $2.131^{+0.091}_{-0.091}$     | $D_M(0.15)$           | $631^{+14}_{-14}$               | $\chi_{BAO}^2$     | $6.5 (\nu: 0.9)$             |
| $10^9 A_s e^{-2\tau}$       | $1.925^{+0.050}_{-0.049}$     | $H(0.38)$             | $83.9^{+1.3}_{-1.2}$            | $\chi_{CMB}^2$     | $2288.1 (\nu: 6.5)$          |
| $D_{40}$                    | $1256^{+61}_{-61}$            | $D_M(0.38)$           | $1509^{+29}_{-30}$              |                    |                              |
| $D_{220}$                   | $5995^{+260}_{-280}$          | $H(0.51)$             | $90.5^{+1.2}_{-1.1}$            |                    |                              |

$$\bar{\chi}_{eff}^2 = 2305.61; \Delta\bar{\chi}_{eff}^2 = 0.72; R - 1 = 0.01338$$



### 3.19 base\_Alens\_CamSpecHM\_EE\_lowE\_post\_zre6p5

| Parameter                          | 95% limits                    | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.0236^{+0.0025}_{-0.0024}$  | $D_{40}$                       | $1256^{+61}_{-61}$              | $D_{\text{M}}(0.15)$      | $633^{+49}_{-45}$            |
| $\Omega_{\text{c}}h^2$             | $0.118^{+0.010}_{-0.0094}$    | $D_{220}$                      | $5990^{+400}_{-400}$            | $H(0.38)$                 | $83.9^{+4.0}_{-3.7}$         |
| $100\theta_{\text{MC}}$            | $1.0393^{+0.0017}_{-0.0017}$  | $D_{810}$                      | $2600^{+74}_{-78}$              | $D_{\text{M}}(0.38)$      | $1511^{+99}_{-93}$           |
| $\tau$                             | $0.054^{+0.013}_{-0.011}$     | $D_{1420}$                     | $842^{+35}_{-38}$               | $H(0.51)$                 | $90.5^{+3.4}_{-3.1}$         |
| $A_{\text{L}}$                     | $1.16^{+0.49}_{-0.44}$        | $D_{2000}$                     | $241^{+15}_{-16}$               | $D_{\text{M}}(0.51)$      | $1958^{+120}_{-110}$         |
| $\ln(10^{10}A_{\text{s}})$         | $3.066^{+0.038}_{-0.035}$     | $n_{\text{s},0.002}$           | $0.972^{+0.030}_{-0.029}$       | $H(0.61)$                 | $96.1^{+2.8}_{-2.8}$         |
| $n_{\text{s}}$                     | $0.972^{+0.030}_{-0.029}$     | $Y_{\text{P}}$                 | $0.24588^{+0.00097}_{-0.0010}$  | $D_{\text{M}}(0.61)$      | $2280^{+130}_{-120}$         |
| $y_{\text{cal}}$                   | $0.99996^{+0.0049}_{-0.0049}$ | $Y_{\text{P}}^{\text{BBN}}$    | $0.24721^{+0.00097}_{-0.0010}$  | $H(2.33)$                 | $236.2^{+4.8}_{-4.1}$        |
| $H_0$                              | $68.7^{+5.6}_{-5.6}$          | $10^5\text{D}/\text{H}$        | $2.38^{+0.44}_{-0.38}$          | $D_{\text{M}}(2.33)$      | $5725^{+130}_{-140}$         |
| $\Omega_{\Lambda}$                 | $0.697^{+0.062}_{-0.068}$     | $\text{Age}/\text{Gyr}$        | $13.71^{+0.30}_{-0.31}$         | $f\sigma_8(0.15)$         | $0.449^{+0.064}_{-0.059}$    |
| $\Omega_{\text{m}}$                | $0.303^{+0.068}_{-0.062}$     | $z_*$                          | $1088.3^{+3.8}_{-3.3}$          | $\sigma_8(0.15)$          | $0.746^{+0.026}_{-0.029}$    |
| $\Omega_{\text{m}}h^2$             | $0.1420^{+0.0082}_{-0.0074}$  | $r_*$                          | $144.1^{+1.3}_{-1.3}$           | $f\sigma_8(0.38)$         | $0.469^{+0.048}_{-0.047}$    |
| $\Omega_{\text{m}}h^3$             | $0.0974^{+0.0037}_{-0.0034}$  | $100\theta_*$                  | $1.0394^{+0.0016}_{-0.0016}$    | $\sigma_8(0.38)$          | $0.663^{+0.018}_{-0.020}$    |
| $\sigma_8$                         | $0.807^{+0.035}_{-0.037}$     | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.86^{+0.12}_{-0.13}$         | $f\sigma_8(0.51)$         | $0.468^{+0.040}_{-0.041}$    |
| $S_8$                              | $0.81^{+0.13}_{-0.11}$        | $z_{\text{drag}}$              | $1062.5^{+4.9}_{-5.0}$          | $\sigma_8(0.51)$          | $0.621^{+0.015}_{-0.016}$    |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.444^{+0.070}_{-0.062}$     | $r_{\text{drag}}$              | $146.4^{+1.4}_{-1.4}$           | $f\sigma_8(0.61)$         | $0.464^{+0.034}_{-0.036}$    |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.598^{+0.059}_{-0.056}$     | $k_{\text{D}}$                 | $0.1425^{+0.0026}_{-0.0026}$    | $\sigma_8(0.61)$          | $0.591^{+0.013}_{-0.014}$    |
| $\sigma_8/h^{0.5}$                 | $0.974^{+0.082}_{-0.079}$     | $100\theta_{\text{D}}$         | $0.1591^{+0.0028}_{-0.0026}$    | $f\sigma_8(2.33)$         | $0.2983^{+0.0062}_{-0.0059}$ |
| $r_{\text{drag}}h$                 | $100.6^{+8.2}_{-8.3}$         | $z_{\text{eq}}$                | $3377^{+200}_{-180}$            | $\sigma_8(2.33)$          | $0.3081^{+0.0067}_{-0.0063}$ |
| $\langle d^2 \rangle^{1/2}$        | $2.60^{+0.46}_{-0.51}$        | $k_{\text{eq}}$                | $0.01031^{+0.00060}_{-0.00054}$ | $\chi_{\text{simall}}^2$  | $396.5 (\nu: 1.0)$           |
| $z_{\text{re}}$                    | $< 8.48$                      | $100\theta_{\text{eq}}$        | $0.821^{+0.039}_{-0.040}$       | $\chi_{\text{CamSpec}}^2$ | $1892.2 (\nu: 6.3)$          |
| $10^9 A_{\text{s}}$                | $2.147^{+0.082}_{-0.075}$     | $100\theta_{\text{s,eq}}$      | $0.452^{+0.019}_{-0.020}$       | $\chi_{\text{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_{\text{s}}e^{-2\tau}$      | $1.926^{+0.049}_{-0.049}$     | $H(0.15)$                      | $73.9^{+5.0}_{-4.9}$            | $\chi_{\text{CMB}}^2$     | $2288.7 (\nu: 7.1)$          |

$$\bar{\chi}_{\text{eff}}^2 = 2299.69; \Delta\bar{\chi}_{\text{eff}}^2 = 0.72; R - 1 = 0.00845$$



### 3.20 base\_Alens\_CamSpecHM\_EE\_lowE\_post\_BAO\_zre6p5

| Parameter                          | 95% limits                    | Parameter                      | 95% limits                      | Parameter                 | 95% limits                   |
|------------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$             | $0.0236^{+0.0013}_{-0.0013}$  | $D_{810}$                      | $2601^{+65}_{-64}$              | $D_{\text{M}}(0.51)$      | $1957^{+35}_{-37}$           |
| $\Omega_{\text{c}}h^2$             | $0.1175^{+0.0029}_{-0.0029}$  | $D_{1420}$                     | $842^{+28}_{-29}$               | $H(0.61)$                 | $96.0^{+1.1}_{-1.1}$         |
| $100\theta_{\text{MC}}$            | $1.0393^{+0.0014}_{-0.0016}$  | $D_{2000}$                     | $242^{+11}_{-10}$               | $D_{\text{M}}(0.61)$      | $2279^{+38}_{-41}$           |
| $\tau$                             | $0.054^{+0.013}_{-0.010}$     | $n_{\text{s},0.002}$           | $0.972^{+0.020}_{-0.020}$       | $H(2.33)$                 | $235.9^{+2.0}_{-1.9}$        |
| $A_{\text{L}}$                     | $1.15^{+0.46}_{-0.40}$        | $Y_{\text{P}}$                 | $0.24588^{+0.00051}_{-0.00052}$ | $D_{\text{M}}(2.33)$      | $5726^{+57}_{-58}$           |
| $\ln(10^{10}A_{\text{s}})$         | $3.066^{+0.036}_{-0.035}$     | $Y_{\text{P}}^{\text{BBN}}$    | $0.24721^{+0.00051}_{-0.00052}$ | $f\sigma_8(0.15)$         | $0.447^{+0.019}_{-0.018}$    |
| $n_{\text{s}}$                     | $0.972^{+0.020}_{-0.020}$     | $10^5\text{D}/\text{H}$        | $2.38^{+0.22}_{-0.21}$          | $\sigma_8(0.15)$          | $0.747^{+0.016}_{-0.015}$    |
| $y_{\text{cal}}$                   | $0.99997^{+0.0049}_{-0.0049}$ | $\text{Age}/\text{Gyr}$        | $13.71^{+0.13}_{-0.14}$         | $f\sigma_8(0.38)$         | $0.468^{+0.016}_{-0.015}$    |
| $H_0$                              | $68.7^{+1.7}_{-1.6}$          | $z_*$                          | $1088.3^{+1.6}_{-1.5}$          | $\sigma_8(0.38)$          | $0.663^{+0.014}_{-0.012}$    |
| $\Omega_{\Lambda}$                 | $0.700^{+0.017}_{-0.018}$     | $r_*$                          | $144.2^{+1.1}_{-1.1}$           | $f\sigma_8(0.51)$         | $0.468^{+0.014}_{-0.014}$    |
| $\Omega_{\text{m}}$                | $0.300^{+0.018}_{-0.017}$     | $100\theta_*$                  | $1.0394^{+0.0015}_{-0.0016}$    | $\sigma_8(0.51)$          | $0.621^{+0.012}_{-0.012}$    |
| $\Omega_{\text{m}}h^2$             | $0.1417^{+0.0030}_{-0.0027}$  | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.87^{+0.10}_{-0.11}$         | $f\sigma_8(0.61)$         | $0.464^{+0.013}_{-0.012}$    |
| $\Omega_{\text{m}}h^3$             | $0.0974^{+0.0024}_{-0.0023}$  | $z_{\text{drag}}$              | $1062.5^{+2.8}_{-2.8}$          | $\sigma_8(0.61)$          | $0.591^{+0.012}_{-0.011}$    |
| $\sigma_8$                         | $0.807^{+0.018}_{-0.017}$     | $r_{\text{drag}}$              | $146.4^{+1.4}_{-1.4}$           | $f\sigma_8(2.33)$         | $0.2986^{+0.0060}_{-0.0055}$ |
| $S_8$                              | $0.807^{+0.036}_{-0.035}$     | $k_{\text{D}}$                 | $0.1424^{+0.0023}_{-0.0023}$    | $\sigma_8(2.33)$          | $0.3084^{+0.0064}_{-0.0057}$ |
| $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.442^{+0.020}_{-0.019}$     | $100\theta_{\text{D}}$         | $0.1591^{+0.0017}_{-0.0016}$    | $\chi_{\text{simall}}^2$  | $396.5 (\nu: 1.0)$           |
| $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.597^{+0.020}_{-0.019}$     | $z_{\text{eq}}$                | $3370^{+71}_{-65}$              | $\chi_{\text{CamSpec}}^2$ | $1891.3 (\nu: 5.1)$          |
| $\sigma_8/h^{0.5}$                 | $0.973^{+0.028}_{-0.027}$     | $k_{\text{eq}}$                | $0.01029^{+0.00022}_{-0.00020}$ | $\chi_{6\text{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $r_{\text{drag}}h$                 | $100.6^{+2.3}_{-2.2}$         | $100\theta_{\text{eq}}$        | $0.821^{+0.012}_{-0.012}$       | $\chi_{\text{MGS}}^2$     | $1.85 (\nu: 0.2)$            |
| $\langle d^2 \rangle^{1/2}$        | $2.59^{+0.48}_{-0.50}$        | $100\theta_{\text{s,eq}}$      | $0.4526^{+0.0061}_{-0.0063}$    | $\chi_{\text{DR12BAO}}^2$ | $4.6 (\nu: 0.9)$             |
| $z_{\text{re}}$                    | $< 8.53$                      | $H(0.15)$                      | $73.9^{+1.5}_{-1.5}$            | $\chi_{\text{prior}}^2$   | $11.0 (\nu: 1.0)$            |
| $10^9 A_{\text{s}}$                | $2.146^{+0.079}_{-0.073}$     | $D_{\text{M}}(0.15)$           | $632^{+14}_{-14}$               | $\chi_{\text{BAO}}^2$     | $6.5 (\nu: 0.9)$             |
| $10^9 A_{\text{s}}e^{-2\tau}$      | $1.924^{+0.048}_{-0.048}$     | $H(0.38)$                      | $83.9^{+1.3}_{-1.2}$            | $\chi_{\text{CMB}}^2$     | $2287.7 (\nu: 6.1)$          |
| $D_{40}$                           | $1255^{+58}_{-63}$            | $D_{\text{M}}(0.38)$           | $1509^{+29}_{-30}$              |                           |                              |
| $D_{220}$                          | $5988^{+260}_{-280}$          | $H(0.51)$                      | $90.5^{+1.2}_{-1.1}$            |                           |                              |

$$\bar{\chi}_{\text{eff}}^2 = 2305.22; \Delta\bar{\chi}_{\text{eff}}^2 = 0.71; R - 1 = 0.01446$$



### 3.21 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022439 | $0.02243^{+0.00036}_{-0.00035}$ | $S_8$                       | 0.8055   | $0.805^{+0.038}_{-0.037}$       | $H(0.15)$                   | 73.34    | $73.3^{+1.2}_{-1.2}$         |
| $\Omega_c h^2$              | 0.11807  | $0.1182^{+0.0031}_{-0.0031}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4412   | $0.441^{+0.021}_{-0.020}$       | $D_M(0.15)$                 | 636.8    | $637^{+12}_{-12}$            |
| $100\theta_{MC}$            | 1.04105  | $1.04104^{+0.00062}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.5941   | $0.594^{+0.019}_{-0.020}$       | $H(0.38)$                   | 83.32    | $83.29^{+0.91}_{-0.88}$      |
| $\tau$                      | 0.0504   | $0.049^{+0.015}_{-0.017}$       | $\sigma_8/h^{0.5}$          | 0.9693   | $0.969^{+0.027}_{-0.028}$       | $D_M(0.38)$                 | 1520.5   | $1521^{+24}_{-24}$           |
| $A_L$                       | 1.062    | $1.064^{+0.084}_{-0.080}$       | $r_{drag}h$                 | 100.52   | $100.5^{+2.5}_{-2.4}$           | $H(0.51)$                   | 89.96    | $89.94^{+0.73}_{-0.70}$      |
| $\ln(10^{10} A_s)$          | 3.0296   | $3.027^{+0.032}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | 2.472    | $2.471^{+0.060}_{-0.059}$       | $D_M(0.51)$                 | 1970.8   | $1972^{+28}_{-28}$           |
| $n_s$                       | 0.9700   | $0.9695^{+0.0097}_{-0.010}$     | $z_{re}$                    | 7.24     | $7.1^{+1.6}_{-1.7}$             | $H(0.61)$                   | 95.52    | $95.51^{+0.59}_{-0.56}$      |
| $y_{cal}$                   | 1.00004  | $1.0000^{+0.0048}_{-0.0048}$    | $10^9 A_s$                  | 2.069    | $2.063^{+0.066}_{-0.070}$       | $D_M(0.61)$                 | 2294.3   | $2295^{+30}_{-31}$           |
| $A_{100}^{PS}$              | 240.0    | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8704   | $1.871^{+0.024}_{-0.024}$       | $H(2.33)$                   | 235.37   | $235.4^{+1.8}_{-1.8}$        |
| $A_{143}^{PS}$              | 36.7     | $38^{+20}_{-20}$                | $D_{40}$                    | 1215.4   | $1216^{+29}_{-27}$              | $D_M(2.33)$                 | 5754.4   | $5755^{+25}_{-26}$           |
| $A_{217}^{PS}$              | 105.3    | $103^{+20}_{-30}$               | $D_{220}$                   | 5721     | $5721^{+77}_{-74}$              | $f\sigma_8(0.15)$           | 0.4463   | $0.446^{+0.019}_{-0.019}$    |
| $A_{217}^{CIB}$             | 37.5     | $39^{+10}_{-10}$                | $D_{810}$                   | 2530.1   | $2530^{+27}_{-27}$              | $\sigma_8(0.15)$            | 0.7401   | $0.739^{+0.014}_{-0.015}$    |
| $A_{143}^{tSZ}$             | 3.47     | $< 7.54$                        | $D_{1420}$                  | 815.2    | $815.0^{+9.4}_{-9.4}$           | $f\sigma_8(0.38)$           | 0.4661   | $0.466^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{PS}$   | 0.676    | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | 230.79   | $230.6^{+3.2}_{-3.1}$           | $\sigma_8(0.38)$            | 0.6569   | $0.656^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | 0.41     | —                               | $n_{s,0.002}$               | 0.9700   | $0.9695^{+0.0097}_{-0.010}$     | $f\sigma_8(0.51)$           | 0.4656   | $0.465^{+0.014}_{-0.014}$    |
| $\xi^{tSZ \times CIB}$      | 0.36     | —                               | $Y_P$                       | 0.245422 | $0.24542^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | 0.6150   | $0.614^{+0.011}_{-0.012}$    |
| $A^{kSZ}$                   | 4.7      | —                               | $Y_P^{BBN}$                 | 0.246749 | $0.24674^{+0.00014}_{-0.00014}$ | $f\sigma_8(0.61)$           | 0.4612   | $0.461^{+0.013}_{-0.013}$    |
| $A_{100}^{dust}$            | 1.019    | $1.02^{+0.38}_{-0.38}$          | $10^5 D/H$                  | 2.573    | $2.576^{+0.065}_{-0.065}$       | $\sigma_8(0.61)$            | 0.5854   | $0.5846^{+0.0099}_{-0.011}$  |
| $A_{143}^{dust}$            | 0.957    | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | 13.778   | $13.780^{+0.056}_{-0.058}$      | $f\sigma_8(2.33)$           | 0.2955   | $0.2950^{+0.0049}_{-0.0053}$ |
| $A_{217}^{dust}$            | 0.971    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.66  | $1089.69^{+0.64}_{-0.65}$       | $\sigma_8(2.33)$            | 0.3050   | $0.3045^{+0.0049}_{-0.0054}$ |
| $A_{143 \times 217}^{dust}$ | 1.052    | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | 144.88   | $144.87^{+0.67}_{-0.66}$        | $f_{2000}^{143}$            | 28.5     | $29^{+6}_{-6}$               |
| $c_{100}$                   | 0.99749  | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | 1.04123  | $1.04122^{+0.00061}_{-0.00063}$ | $f_{2000}^{217}$            | 105.95   | $106.1^{+3.9}_{-3.9}$        |
| $c_{217}$                   | 1.00069  | $1.0010^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | 13.914   | $13.913^{+0.062}_{-0.060}$      | $f_{2000}^{143 \times 217}$ | 31.29    | $31^{+4}_{-4}$               |
| $c_{TE}$                    | 0.9949   | $0.995^{+0.010}_{-0.0097}$      | $z_{drag}$                  | 1059.97  | $1059.94^{+0.72}_{-0.69}$       | $\chi_{lensing}^2$          | 9.02     | $9.8 (\nu: 1.4)$             |
| $c_{EE}$                    | 0.9915   | $0.9917^{+0.0096}_{-0.0096}$    | $r_{drag}$                  | 147.53   | $147.52^{+0.66}_{-0.64}$        | $\chi_{small}^2$            | 395.66   | $396.8 (\nu: 1.1)$           |
| $H_0$                       | 68.14    | $68.1^{+1.4}_{-1.4}$            | $k_D$                       | 0.14046  | $0.14046^{+0.00067}_{-0.00067}$ | $\chi_{lowl}^2$             | 22.23    | $22.37 (\nu: 0.4)$           |
| $\Omega_\Lambda$            | 0.6960   | $0.695^{+0.018}_{-0.019}$       | $100\theta_D$               | 0.160745 | $0.16076^{+0.00040}_{-0.00040}$ | $\chi_{CamSpec}^2$          | 11498.6  | $11513.3 (\nu: 16.1)$        |
| $\Omega_m$                  | 0.3040   | $0.305^{+0.019}_{-0.018}$       | $z_{eq}$                    | 3358     | $3360^{+69}_{-68}$              | $\chi_{prior}^2$            | 2.1      | $7.7 (\nu: 5.5)$             |
| $\Omega_m h^2$              | 0.14115  | $0.1412^{+0.0029}_{-0.0028}$    | $k_{eq}$                    | 0.010248 | $0.01025^{+0.00021}_{-0.00021}$ | $\chi_{CMB}^2$              | 11925.5  | $11942.2 (\nu: 17.0)$        |
| $\Omega_m h^3$              | 0.09618  | $0.09616^{+0.00062}_{-0.00062}$ | $100\theta_{eq}$            | 0.8216   | $0.821^{+0.013}_{-0.013}$       |                             |          |                              |
| $\sigma_8$                  | 0.8001   | $0.799^{+0.016}_{-0.018}$       | $100\theta_{s,eq}$          | 0.4537   | $0.4535^{+0.0068}_{-0.0067}$    |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11927.65$ ;  $\Delta\chi_{\text{eff}}^2 = -2.01$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.88$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -1.56$ ;  $R - 1 = 0.01480$   
 $\chi_{\text{eff}}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 9.02 ( $\Delta$  0.19) simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.66 ( $\Delta$  -0.21) commander\_dx12.v3.2.29: 22.23 ( $\Delta$  -0.99) CamSpec like\_10.7HM\_1400\_unified: 11498.60 ( $\Delta$  -1.05)



### 3.22 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02242^{+0.00032}_{-0.00030}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.441^{+0.015}_{-0.015}$       | $H(0.38)$                   | $83.29^{+0.64}_{-0.61}$      |
| $\Omega_{\text{c}} h^2$              | $0.1182^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.594^{+0.015}_{-0.016}$       | $D_{\text{M}}(0.38)$        | $1521^{+16}_{-17}$           |
| $100\theta_{\text{MC}}$              | $1.04104^{+0.00057}_{-0.00057}$ | $\sigma_8/h^{0.5}$                  | $0.969^{+0.022}_{-0.023}$       | $H(0.51)$                   | $89.94^{+0.51}_{-0.49}$      |
| $\tau$                               | $0.049^{+0.015}_{-0.017}$       | $r_{\text{drag}} h$                 | $100.4^{+1.7}_{-1.6}$           | $D_{\text{M}}(0.51)$        | $1972^{+19}_{-20}$           |
| $A_{\text{L}}$                       | $1.064^{+0.074}_{-0.071}$       | $\langle d^2 \rangle^{1/2}$         | $2.471^{+0.060}_{-0.059}$       | $H(0.61)$                   | $95.50^{+0.43}_{-0.41}$      |
| $\ln(10^{10} A_{\text{s}})$          | $3.027^{+0.033}_{-0.034}$       | $z_{\text{re}}$                     | $7.1^{+1.6}_{-1.7}$             | $D_{\text{M}}(0.61)$        | $2295^{+21}_{-21}$           |
| $n_{\text{s}}$                       | $0.9695^{+0.0082}_{-0.0083}$    | $10^9 A_{\text{s}}$                 | $2.063^{+0.068}_{-0.070}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$        |
| $y_{\text{cal}}$                     | $1.0000^{+0.0049}_{-0.0048}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.871^{+0.022}_{-0.022}$       | $D_{\text{M}}(2.33)$        | $5755^{+19}_{-20}$           |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $D_{40}$                            | $1216^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.446^{+0.014}_{-0.015}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                           | $5720^{+77}_{-73}$              | $\sigma_8(0.15)$            | $0.739^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                           | $2530^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.466^{+0.012}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                          | $814.9^{+9.6}_{-9.6}$           | $\sigma_8(0.38)$            | $0.656^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.47$                        | $D_{2000}$                          | $230.6^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.465^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{\text{s},0.002}$                | $0.9695^{+0.0082}_{-0.0083}$    | $\sigma_8(0.51)$            | $0.614^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.24541^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.461^{+0.010}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24674^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5846^{+0.0099}_{-0.011}$  |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.576^{+0.057}_{-0.057}$       | $f\sigma_8(2.33)$           | $0.2950^{+0.0050}_{-0.0052}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.40}_{-0.38}$          | $\text{Age}/\text{Gyr}$             | $13.781^{+0.044}_{-0.045}$      | $\sigma_8(2.33)$            | $0.3045^{+0.0050}_{-0.0054}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_*$                               | $1089.69^{+0.48}_{-0.51}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $144.87^{+0.50}_{-0.50}$        | $f_{2000}^{217}$            | $106.1^{+3.9}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.32}$          | $100\theta_*$                       | $1.04122^{+0.00056}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.913^{+0.047}_{-0.047}$      | $\chi_{\text{lensing}}^2$   | $9.8 (\nu: 1.4)$             |
| $c_{217}$                            | $1.0010^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.93^{+0.65}_{-0.64}$       | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.1)$           |
| $c_{TE}$                             | $0.995^{+0.010}_{-0.0096}$      | $r_{\text{drag}}$                   | $147.52^{+0.51}_{-0.51}$        | $\chi_{\text{lowl}}^2$      | $22.35 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9917^{+0.0098}_{-0.0098}$    | $k_{\text{D}}$                      | $0.14046^{+0.00062}_{-0.00061}$ | $\chi_{\text{CamSpec}}^2$   | $11512.7 (\nu: 15.3)$        |
| $H_0$                                | $68.09^{+0.99}_{-0.96}$         | $100\theta_{\text{D}}$              | $0.16076^{+0.00038}_{-0.00038}$ | $\chi_{6\text{DF}}^2$       | $0.031 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.695^{+0.013}_{-0.013}$       | $z_{\text{eq}}$                     | $3360^{+48}_{-48}$              | $\chi_{\text{MGS}}^2$       | $1.74 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.305^{+0.013}_{-0.013}$       | $k_{\text{eq}}$                     | $0.01025^{+0.00015}_{-0.00015}$ | $\chi_{\text{DR12BAO}}^2$   | $3.99 (\nu: 0.4)$            |
| $\Omega_{\text{m}} h^2$              | $0.1412^{+0.0020}_{-0.0020}$    | $100\theta_{\text{eq}}$             | $0.8213^{+0.0093}_{-0.0091}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.5)$             |
| $\Omega_{\text{m}} h^3$              | $0.09616^{+0.00061}_{-0.00061}$ | $100\theta_{\text{s,eq}}$           | $0.4535^{+0.0048}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11941.7 (\nu: 16.6)$        |
| $\sigma_8$                           | $0.799^{+0.015}_{-0.016}$       | $H(0.15)$                           | $73.30^{+0.86}_{-0.83}$         | $\chi_{\text{BAO}}^2$       | $5.76 (\nu: 0.3)$            |
| $S_8$                                | $0.805^{+0.028}_{-0.028}$       | $D_{\text{M}}(0.15)$                | $637.2^{+8.2}_{-8.3}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11955.09; \Delta\bar{\chi}_{\text{eff}}^2 = -2.31; R - 1 = 0.01872$$



### 3.23 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02243^{+0.00036}_{-0.00035}$ | $S_8$                       | $0.808^{+0.037}_{-0.036}$       | $H(0.15)$                   | $73.3^{+1.2}_{-1.2}$         |
| $\Omega_c h^2$                       | $0.1181^{+0.0031}_{-0.0031}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.020}_{-0.020}$       | $D_M(0.15)$                 | $637^{+12}_{-12}$            |
| $100\theta_{MC}$                     | $1.04104^{+0.00063}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.595^{+0.019}_{-0.018}$       | $H(0.38)$                   | $83.30^{+0.92}_{-0.90}$      |
| $\tau$                               | $0.0522^{+0.011}_{-0.0091}$     | $\sigma_8/h^{0.5}$          | $0.971^{+0.026}_{-0.025}$       | $D_M(0.38)$                 | $1521^{+24}_{-24}$           |
| $A_L$                                | $1.058^{+0.080}_{-0.077}$       | $r_{\text{drag}} h$         | $100.5^{+2.5}_{-2.5}$           | $H(0.51)$                   | $89.95^{+0.74}_{-0.71}$      |
| $\ln(10^{10} A_s)$                   | $3.033^{+0.025}_{-0.023}$       | $\langle d^2 \rangle^{1/2}$ | $2.471^{+0.060}_{-0.060}$       | $D_M(0.51)$                 | $1972^{+29}_{-28}$           |
| $n_s$                                | $0.9697^{+0.0097}_{-0.010}$     | $z_{\text{re}}$             | $< 8.45$                        | $H(0.61)$                   | $95.51^{+0.60}_{-0.57}$      |
| $y_{\text{cal}}$                     | $0.99998^{+0.0049}_{-0.0048}$   | $10^9 A_s$                  | $2.076^{+0.052}_{-0.047}$       | $D_M(0.61)$                 | $2295^{+31}_{-31}$           |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.4^{+1.8}_{-1.8}$        |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{40}$                    | $1217^{+29}_{-27}$              | $D_M(2.33)$                 | $5755^{+26}_{-27}$           |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5720^{+78}_{-74}$              | $f\sigma_8(0.15)$           | $0.447^{+0.019}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2530^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.741^{+0.013}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $D_{1420}$                  | $814.9^{+9.5}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.467^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.26}$          | $D_{2000}$                  | $230.7^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.658^{+0.010}_{-0.0089}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9697^{+0.0097}_{-0.010}$     | $f\sigma_8(0.51)$           | $0.467^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24542^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | $0.6160^{+0.0088}_{-0.0082}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24674^{+0.00014}_{-0.00014}$ | $f\sigma_8(0.61)$           | $0.462^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.37}_{-0.38}$          | $10^5 \text{D/H}$           | $2.576^{+0.066}_{-0.065}$       | $\sigma_8(0.61)$            | $0.5864^{+0.0081}_{-0.0076}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $\text{Age/Gyr}$            | $13.780^{+0.057}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.2959^{+0.0039}_{-0.0036}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.69^{+0.65}_{-0.66}$       | $\sigma_8(2.33)$            | $0.3054^{+0.0039}_{-0.0035}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | $144.87^{+0.68}_{-0.66}$        | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04122^{+0.00062}_{-0.00063}$ | $f_{2000}^{217}$            | $106.1^{+3.9}_{-4.0}$        |
| $c_{217}$                            | $1.0010^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.914^{+0.063}_{-0.060}$      | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$               |
| $c_{TE}$                             | $0.995^{+0.010}_{-0.0097}$      | $z_{\text{drag}}$           | $1059.93^{+0.72}_{-0.69}$       | $\chi_{\text{lensing}}^2$   | $9.8 (\nu: 1.5)$             |
| $c_{EE}$                             | $0.9917^{+0.0096}_{-0.0096}$    | $r_{\text{drag}}$           | $147.52^{+0.66}_{-0.64}$        | $\chi_{\text{simall}}^2$    | $396.31 (\nu: 0.5)$          |
| $H_0$                                | $68.1^{+1.4}_{-1.4}$            | $k_D$                       | $0.14045^{+0.00068}_{-0.00067}$ | $\chi_{\text{lowl}}^2$      | $22.43 (\nu: 0.5)$           |
| $\Omega_\Lambda$                     | $0.695^{+0.018}_{-0.019}$       | $100\theta_D$               | $0.16076^{+0.00040}_{-0.00041}$ | $\chi_{\text{CamSpec}}^2$   | $11513.3 (\nu: 16.5)$        |
| $\Omega_m$                           | $0.305^{+0.019}_{-0.018}$       | $z_{\text{eq}}$             | $3359^{+69}_{-69}$              | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.5)$             |
| $\Omega_m h^2$                       | $0.1412^{+0.0029}_{-0.0029}$    | $k_{\text{eq}}$             | $0.01025^{+0.00021}_{-0.00021}$ | $\chi_{\text{CMB}}^2$       | $11941.9 (\nu: 17.0)$        |
| $\Omega_m h^3$                       | $0.09616^{+0.00063}_{-0.00063}$ | $100\theta_{\text{eq}}$     | $0.821^{+0.014}_{-0.013}$       |                             |                              |
| $\sigma_8$                           | $0.802^{+0.015}_{-0.014}$       | $100\theta_{s,\text{eq}}$   | $0.4536^{+0.0069}_{-0.0068}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11949.57; \Delta\bar{\chi}_{\text{eff}}^2 = -1.67; R - 1 = 0.01602$$



### 3.24 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02242^{+0.00032}_{-0.00031}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.015}_{-0.014}$       | $H(0.38)$                   | $83.29^{+0.63}_{-0.61}$      |
| $\Omega_c h^2$                       | $0.1182^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.596^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | $1521^{+16}_{-17}$           |
| $100\theta_{MC}$                     | $1.04104^{+0.00057}_{-0.00058}$ | $\sigma_8/h^{0.5}$          | $0.972^{+0.021}_{-0.019}$       | $H(0.51)$                   | $89.94^{+0.51}_{-0.49}$      |
| $\tau$                               | $0.0521^{+0.011}_{-0.0090}$     | $r_{\text{drag}} h$         | $100.5^{+1.7}_{-1.6}$           | $D_M(0.51)$                 | $1972^{+19}_{-20}$           |
| $A_L$                                | $1.057^{+0.070}_{-0.068}$       | $\langle d^2 \rangle^{1/2}$ | $2.471^{+0.060}_{-0.059}$       | $H(0.61)$                   | $95.50^{+0.43}_{-0.41}$      |
| $\ln(10^{10} A_s)$                   | $3.033^{+0.025}_{-0.022}$       | $z_{\text{re}}$             | $< 8.44$                        | $D_M(0.61)$                 | $2295^{+21}_{-21}$           |
| $n_s$                                | $0.9696^{+0.0082}_{-0.0082}$    | $10^9 A_s$                  | $2.076^{+0.053}_{-0.046}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$        |
| $y_{\text{cal}}$                     | $1.0000^{+0.0050}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | $5755^{+19}_{-20}$           |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $D_{40}$                    | $1217^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.448^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5720^{+77}_{-72}$              | $\sigma_8(0.15)$            | $0.741^{+0.012}_{-0.0099}$   |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                   | $2530^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.467^{+0.012}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $814.9^{+9.6}_{-9.8}$           | $\sigma_8(0.38)$            | $0.6580^{+0.0093}_{-0.0085}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.47$                        | $D_{2000}$                  | $230.6^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.467^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.26}$          | $n_{s,0.002}$               | $0.9696^{+0.0082}_{-0.0082}$    | $\sigma_8(0.51)$            | $0.6161^{+0.0085}_{-0.0077}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24541^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4623^{+0.0095}_{-0.0091}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24674^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5864^{+0.0080}_{-0.0072}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 D/H$                  | $2.576^{+0.057}_{-0.057}$       | $f\sigma_8(2.33)$           | $0.2959^{+0.0039}_{-0.0035}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.40}_{-0.38}$          | Age/Gyr                     | $13.781^{+0.044}_{-0.045}$      | $\sigma_8(2.33)$            | $0.3054^{+0.0039}_{-0.0035}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_*$                       | $1089.69^{+0.49}_{-0.51}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $144.87^{+0.50}_{-0.49}$        | $f_{2000}^{217}$            | $106.1^{+3.9}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.32}$          | $100\theta_*$               | $1.04122^{+0.00056}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.913^{+0.047}_{-0.047}$      | $\chi_{\text{lensing}}^2$   | $9.8 (\nu: 1.5)$             |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.93^{+0.66}_{-0.68}$       | $\chi_{\text{simall}}^2$    | $396.31 (\nu: 0.5)$          |
| $c_{TE}$                             | $0.9951^{+0.0099}_{-0.0094}$    | $r_{\text{drag}}$           | $147.52^{+0.51}_{-0.51}$        | $\chi_{\text{lowl}}^2$      | $22.41 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9917^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.14045^{+0.00063}_{-0.00061}$ | $\chi_{\text{CamSpec}}^2$   | $11512.7 (\nu: 15.6)$        |
| $H_0$                                | $68.09^{+0.99}_{-0.96}$         | $100\theta_D$               | $0.16076^{+0.00038}_{-0.00038}$ | $\chi_{6\text{DF}}^2$       | $0.031 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.695^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3359^{+48}_{-48}$              | $\chi_{\text{MGS}}^2$       | $1.74 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.305^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01025^{+0.00015}_{-0.00015}$ | $\chi_{\text{DR12BAO}}^2$   | $3.99 (\nu: 0.4)$            |
| $\Omega_m h^2$                       | $0.1412^{+0.0020}_{-0.0020}$    | $100\theta_{\text{eq}}$     | $0.8213^{+0.0093}_{-0.0091}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.6)$             |
| $\Omega_m h^3$                       | $0.09616^{+0.00062}_{-0.00063}$ | $100\theta_{s,\text{eq}}$   | $0.4535^{+0.0048}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11941.3 (\nu: 16.5)$        |
| $\sigma_8$                           | $0.802^{+0.013}_{-0.012}$       | $H(0.15)$                   | $73.30^{+0.85}_{-0.83}$         | $\chi_{\text{BAO}}^2$       | $5.76 (\nu: 0.3)$            |
| $S_8$                                | $0.808^{+0.027}_{-0.026}$       | $D_M(0.15)$                 | $637.2^{+8.1}_{-8.3}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11954.75; \Delta\bar{\chi}_{\text{eff}}^2 = -2.51; R - 1 = 0.02132$$



### 3.25 base\_Alens\_CamSpecHM\_TT

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.02262  | $0.02256^{+0.00062}_{-0.00059}$ | $S_8$                          | 0.848    | $0.834^{+0.10}_{-0.093}$        | $100\theta_{\text{eq}}$     | 0.8273   | $0.826^{+0.024}_{-0.024}$ |
| $\Omega_c h^2$                       | 0.1168   | $0.1172^{+0.0055}_{-0.0054}$    | $\sigma_8 \Omega_m^{0.5}$      | 0.464    | $0.457^{+0.055}_{-0.051}$       | $100\theta_{\text{s,eq}}$   | 0.4565   | $0.456^{+0.012}_{-0.012}$ |
| $100\theta_{\text{MC}}$              | 1.04141  | $1.0414^{+0.0011}_{-0.0011}$    | $\sigma_8 \Omega_m^{0.25}$     | 0.630    | $0.618^{+0.065}_{-0.061}$       | $H(0.15)$                   | 73.98    | $73.8^{+2.3}_{-2.2}$      |
| $\tau$                               | 0.121    | $< 0.188$                       | $\sigma_8/h^{0.5}$             | 1.030    | $1.01^{+0.10}_{-0.097}$         | $D_{\text{M}}(0.15)$        | 630.6    | $633^{+22}_{-21}$         |
| $A_{\text{L}}$                       | 1.080    | $1.12^{+0.28}_{-0.26}$          | $r_{\text{drag}} h$            | 101.71   | $101.3^{+4.5}_{-4.4}$           | $H(0.38)$                   | 83.81    | $83.7^{+1.7}_{-1.6}$      |
| $\ln(10^{10} A_{\text{s}})$          | 3.169    | $3.12^{+0.19}_{-0.17}$          | $\langle d^2 \rangle^{1/2}$    | 2.642    | $2.63^{+0.15}_{-0.16}$          | $D_{\text{M}}(0.38)$        | 1507.8   | $1512^{+44}_{-43}$        |
| $n_{\text{s}}$                       | 0.9764   | $0.974^{+0.017}_{-0.016}$       | $z_{\text{re}}$                | 13.4     | $11.0^{+7.6}_{-8.4}$            | $H(0.51)$                   | 90.37    | $90.3^{+1.4}_{-1.3}$      |
| $A_{100}^{\text{PS}}$                | 220      | $230^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | 2.378    | $2.28^{+0.45}_{-0.38}$          | $D_{\text{M}}(0.51)$        | 1956     | $1961^{+51}_{-51}$        |
| $A_{143}^{\text{PS}}$                | 43.7     | $34^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8663   | $1.867^{+0.031}_{-0.031}$       | $H(0.61)$                   | 95.86    | $95.8^{+1.1}_{-1.0}$      |
| $A_{217}^{\text{PS}}$                | 108.4    | $104^{+30}_{-30}$               | $D_{40}$                       | 1235     | $1233^{+60}_{-54}$              | $D_{\text{M}}(0.61)$        | 2278     | $2283^{+55}_{-56}$        |
| $A_{217}^{\text{CIB}}$               | 37.8     | $37^{+10}_{-10}$                | $D_{220}$                      | 5724     | $5723^{+83}_{-82}$              | $H(2.33)$                   | 234.73   | $235.0^{+3.2}_{-3.1}$     |
| $A_{143}^{\text{tSZ}}$               | 6.31     | $4.2^{+3.6}_{-4.1}$             | $D_{810}$                      | 2526.9   | $2525^{+28}_{-28}$              | $D_{\text{M}}(2.33)$        | 5738.7   | $5743^{+46}_{-49}$        |
| $r_{143 \times 217}^{\text{PS}}$     | 0.764    | $0.68^{+0.28}_{-0.26}$          | $D_{1420}$                     | 815.5    | $814^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.470    | $0.463^{+0.054}_{-0.050}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.78     | —                               | $D_{2000}$                     | 232.91   | $232.1^{+4.3}_{-4.3}$           | $\sigma_8(0.15)$            | 0.791    | $0.774^{+0.076}_{-0.069}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.89     | —                               | $n_{\text{s},0.002}$           | 0.9764   | $0.974^{+0.017}_{-0.016}$       | $f\sigma_8(0.38)$           | 0.494    | $0.484^{+0.053}_{-0.048}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}$                 | 0.245487 | $0.24547^{+0.00027}_{-0.00024}$ | $\sigma_8(0.38)$            | 0.703    | $0.688^{+0.067}_{-0.060}$ |
| $A_{100}^{\text{dust}}$              | 0.995    | $1.00^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246814 | $0.24679^{+0.00027}_{-0.00025}$ | $f\sigma_8(0.51)$           | 0.4942   | $0.485^{+0.050}_{-0.047}$ |
| $A_{143}^{\text{dust}}$              | 0.965    | $0.95^{+0.34}_{-0.35}$          | $10^5 D/H$                     | 2.541    | $2.55^{+0.11}_{-0.11}$          | $\sigma_8(0.51)$            | 0.659    | $0.644^{+0.063}_{-0.056}$ |
| $A_{217}^{\text{dust}}$              | 0.989    | $0.98^{+0.20}_{-0.20}$          | Age/Gyr                        | 13.744   | $13.75^{+0.10}_{-0.11}$         | $f\sigma_8(0.61)$           | 0.4904   | $0.481^{+0.049}_{-0.046}$ |
| $A_{143 \times 217}^{\text{dust}}$   | 1.007    | $1.01^{+0.32}_{-0.32}$          | $z_*$                          | 1089.33  | $1089.4^{+1.1}_{-1.1}$          | $\sigma_8(0.61)$            | 0.628    | $0.614^{+0.060}_{-0.053}$ |
| $y_{\text{cal}}$                     | 1.00007  | $1.0000^{+0.0048}_{-0.0048}$    | $r_*$                          | 145.08   | $145.0^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | 0.3172   | $0.310^{+0.030}_{-0.027}$ |
| $c_{100}$                            | 0.99783  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                  | 1.04157  | $1.0415^{+0.0011}_{-0.0010}$    | $\sigma_8(2.33)$            | 0.3278   | $0.320^{+0.031}_{-0.028}$ |
| $c_{217}$                            | 1.00083  | $1.0008^{+0.0030}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.929   | $13.92^{+0.10}_{-0.10}$         | $f_{2000}^{143}$            | 25.8     | $26^{+7}_{-7}$            |
| $H_0$                                | 68.87    | $68.7^{+2.6}_{-2.6}$            | $z_{\text{drag}}$              | 1060.28  | $1060.2^{+1.2}_{-1.1}$          | $f_{2000}^{217}$            | 103.72   | $104.5^{+4.9}_{-4.8}$     |
| $\Omega_{\Lambda}$                   | 0.7048   | $0.701^{+0.032}_{-0.034}$       | $r_{\text{drag}}$              | 147.67   | $147.6^{+1.1}_{-1.1}$           | $f_{2000}^{143 \times 217}$ | 28.8     | $29^{+5}_{-5}$            |
| $\Omega_{\text{m}}$                  | 0.2952   | $0.299^{+0.034}_{-0.032}$       | $k_{\text{D}}$                 | 0.14044  | $0.1404^{+0.0011}_{-0.0011}$    | $\chi_{\text{CamSpec}}^2$   | 7045.0   | $7059.9 (\nu: 14.8)$      |
| $\Omega_{\text{m}} h^2$              | 0.1400   | $0.1404^{+0.0051}_{-0.0050}$    | $100\theta_{\text{D}}$         | 0.16060  | $0.16066^{+0.00063}_{-0.00062}$ | $\chi_{\text{prior}}^2$     | 1.4      | $7.2 (\nu: 5.4)$          |
| $\Omega_{\text{m}} h^3$              | 0.09645  | $0.0964^{+0.0010}_{-0.00099}$   | $z_{\text{eq}}$                | 3331     | $3341^{+120}_{-120}$            |                             |          |                           |
| $\sigma_8$                           | 0.855    | $0.836^{+0.082}_{-0.075}$       | $k_{\text{eq}}$                | 0.010167 | $0.01020^{+0.00037}_{-0.00036}$ |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 7046.45$ ;  $\Delta\chi_{\text{eff}}^2 = -0.25$ ;  $\bar{\chi}_{\text{eff}}^2 = 7067.10$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.23$ ;  $R - 1 = 0.00805$   
 $\chi_{\text{eff}}^2$ : CMB - CamSpec like\_10.7HM: 7045.02 ( $\Delta$  -0.23)



### 3.26 base\_Alens\_CamSpecHM\_TT\_post\_BAO

| Parameter  | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\text{b}} h^2$                                | $0.02248^{+0.00044}_{-0.00044}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.461^{+0.047}_{-0.043}$       | $H(0.15)$                   | $73.4^{+1.1}_{-1.0}$      |
| $\Omega_{\text{c}} h^2$                                | $0.1181^{+0.0026}_{-0.0026}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.621^{+0.061}_{-0.055}$       | $D_{\text{M}}(0.15)$        | $636^{+10}_{-10}$         |
| $100\theta_{\text{MC}}$                                | $1.04123^{+0.00086}_{-0.00087}$ | $\sigma_8/h^{0.5}$                  | $1.013^{+0.099}_{-0.089}$       | $H(0.38)$                   | $83.40^{+0.82}_{-0.78}$   |
| $\tau$   | $< 0.182$                       | $r_{\text{drag}} h$                 | $100.6^{+2.0}_{-2.0}$           | $D_{\text{M}}(0.38)$        | $1519^{+21}_{-21}$        |
| $A_{\text{L}}$   | $1.11^{+0.25}_{-0.24}$          | $\langle d^2 \rangle^{1/2}$         | $2.62^{+0.15}_{-0.15}$          | $H(0.51)$                   | $90.04^{+0.68}_{-0.65}$   |
| $\ln(10^{10} A_{\text{s}})$                            | $3.12^{+0.18}_{-0.17}$          | $z_{\text{re}}$                     | $10.8^{+7.6}_{-8.2}$            | $D_{\text{M}}(0.51)$        | $1969^{+24}_{-25}$        |
| $n_{\text{s}}$   | $0.972^{+0.010}_{-0.0098}$      | $10^9 A_{\text{s}}$                 | $2.27^{+0.43}_{-0.37}$          | $H(0.61)$                   | $95.60^{+0.58}_{-0.55}$   |
| $A_{100}^{\text{PS}}$                                  | $231^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.871^{+0.023}_{-0.023}$       | $D_{\text{M}}(0.61)$        | $2292^{+26}_{-27}$        |
| $A_{143}^{\text{PS}}$                                  | $35^{+20}_{-20}$                | $D_{40}$                            | $1236^{+57}_{-46}$              | $H(2.33)$                   | $235.4^{+1.6}_{-1.6}$     |
| $A_{217}^{\text{PS}}$                                  | $104^{+30}_{-30}$               | $D_{220}$                           | $5719^{+81}_{-82}$              | $D_{\text{M}}(2.33)$        | $5750^{+27}_{-28}$        |
| $A_{217}^{\text{CIB}}$                                 | $37^{+10}_{-10}$                | $D_{810}$                           | $2526^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.466^{+0.047}_{-0.043}$ |
| $A_{143}^{\text{tSZ}}$                                 | $4.1^{+3.6}_{-4.1}$             | $D_{1420}$                          | $814^{+10}_{-9.9}$              | $\sigma_8(0.15)$            | $0.774^{+0.074}_{-0.066}$ |
| $r_{143 \times 217}^{\text{PS}}$                       | $0.68^{+0.27}_{-0.26}$          | $D_{2000}$                          | $231.7^{+3.9}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.487^{+0.048}_{-0.043}$ |
| $r_{143 \times 217}^{\text{CIB}}$                      | —                               | $n_{\text{s},0.002}$                | $0.972^{+0.010}_{-0.0098}$      | $\sigma_8(0.38)$            | $0.687^{+0.065}_{-0.058}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$                   | —                               | $Y_{\text{P}}$                      | $0.24544^{+0.00018}_{-0.00018}$ | $f\sigma_8(0.51)$           | $0.487^{+0.048}_{-0.043}$ |
| $A^{\text{kSZ}}$                                       | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24676^{+0.00018}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.644^{+0.061}_{-0.054}$ |
| $A_{100}^{\text{dust}}$                                | $1.00^{+0.39}_{-0.38}$          | $10^5 \text{D}/\text{H}$            | $2.566^{+0.082}_{-0.079}$       | $f\sigma_8(0.61)$           | $0.482^{+0.047}_{-0.042}$ |
| $A_{143}^{\text{dust}}$                                | $0.95^{+0.34}_{-0.35}$          | $\text{Age}/\text{Gyr}$             | $13.768^{+0.063}_{-0.064}$      | $\sigma_8(0.61)$            | $0.613^{+0.058}_{-0.051}$ |
| $A_{217}^{\text{dust}}$                                | $0.98^{+0.20}_{-0.20}$          | $z_*$                               | $1089.61^{+0.67}_{-0.66}$       | $f\sigma_8(2.33)$           | $0.309^{+0.029}_{-0.026}$ |
| $A_{143 \times 217}^{\text{dust}}$                     | $1.02^{+0.32}_{-0.32}$          | $r_*$                               | $144.84^{+0.64}_{-0.63}$        | $\sigma_8(2.33)$            | $0.319^{+0.030}_{-0.027}$ |
| $y_{\text{cal}}$                                       | $1.0000^{+0.0049}_{-0.0048}$    | $100\theta_*$                       | $1.04141^{+0.00085}_{-0.00085}$ | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$  | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.908^{+0.062}_{-0.062}$      | $f_{2000}^{217}$            | $104.9^{+4.4}_{-4.4}$     |
| $c_{217}$  | $1.0008^{+0.0030}_{-0.0031}$    | $z_{\text{drag}}$                   | $1060.06^{+0.98}_{-0.96}$       | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$            |
| $H_0$  | $68.2^{+1.2}_{-1.2}$            | $r_{\text{drag}}$                   | $147.48^{+0.69}_{-0.68}$        | $\chi_{\text{CamSpec}}^2$   | $7059.1 (\nu: 13.8)$      |
| $\Omega_{\Lambda}$                                     | $0.697^{+0.015}_{-0.015}$       | $k_{\text{D}}$                      | $0.14055^{+0.00091}_{-0.00091}$ | $\chi_{6\text{DF}}^2$       | $0.046 (\nu: 0.0)$        |
| $\Omega_{\text{m}}$                                    | $0.303^{+0.015}_{-0.015}$       | $100\theta_{\text{D}}$              | $0.16072^{+0.00055}_{-0.00054}$ | $\chi_{\text{MGS}}^2$       | $1.86 (\nu: 0.2)$         |
| $\Omega_{\text{m}} h^2$                                | $0.1412^{+0.0024}_{-0.0024}$    | $z_{\text{eq}}$                     | $3359^{+58}_{-58}$              | $\chi_{\text{DR12BAO}}^2$   | $4.1 (\nu: 0.6)$          |
| $\Omega_{\text{m}} h^3$                                | $0.09635^{+0.00099}_{-0.00096}$ | $k_{\text{eq}}$                     | $0.01025^{+0.00018}_{-0.00018}$ | $\chi_{\text{prior}}^2$     | $7.2 (\nu: 5.4)$          |
| $\sigma_8$   | $0.837^{+0.080}_{-0.071}$       | $100\theta_{\text{eq}}$             | $0.822^{+0.011}_{-0.011}$       | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.7)$          |
| $S_8$  | $0.842^{+0.086}_{-0.079}$       | $100\theta_{\text{s,eq}}$           | $0.4537^{+0.0057}_{-0.0056}$    |                             |                           |
| $\bar{\chi}_{\text{eff}}^2 = 7072.33; R - 1 = 0.01128$ |                                 |                                     |                                 |                             |                           |



### 3.27 base\_Alens\_CamSpecHM\_TT\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02256^{+0.00062}_{-0.00060}$ | $S_8$                                | $0.847^{+0.092}_{-0.083}$       | $100\theta_{\mathrm{eq}}$   | $0.826^{+0.024}_{-0.023}$ |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1171^{+0.0054}_{-0.0054}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.464^{+0.050}_{-0.046}$       | $100\theta_{\mathrm{s,eq}}$ | $0.456^{+0.012}_{-0.012}$ |
| $100\theta_{\mathrm{MC}}$                | $1.0414^{+0.0011}_{-0.0011}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.628^{+0.058}_{-0.054}$       | $H(0.15)$                   | $73.8^{+2.3}_{-2.2}$      |
| $\tau$                                   | $0.114^{+0.081}_{-0.071}$       | $\sigma_8/h^{0.5}$                   | $1.026^{+0.092}_{-0.083}$       | $D_{\mathrm{M}}(0.15)$      | $632^{+22}_{-21}$         |
| $A_{\mathrm{L}}$                         | $1.08^{+0.25}_{-0.22}$          | $r_{\mathrm{drag}}h$                 | $101.4^{+4.5}_{-4.4}$           | $H(0.38)$                   | $83.7^{+1.7}_{-1.6}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.15^{+0.16}_{-0.14}$          | $\langle d^2 \rangle^{1/2}$          | $2.63^{+0.15}_{-0.15}$          | $D_{\mathrm{M}}(0.38)$      | $1511^{+44}_{-44}$        |
| $n_{\mathrm{s}}$                         | $0.975^{+0.017}_{-0.016}$       | $z_{\mathrm{re}}$                    | $< 18.4$                        | $H(0.51)$                   | $90.3^{+1.4}_{-1.3}$      |
| $A_{100}^{\mathrm{PS}}$                  | $229^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                | $2.35^{+0.40}_{-0.33}$          | $D_{\mathrm{M}}(0.51)$      | $1959^{+52}_{-52}$        |
| $A_{143}^{\mathrm{PS}}$                  | $34^{+20}_{-20}$                | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.866^{+0.031}_{-0.030}$       | $H(0.61)$                   | $95.8^{+1.1}_{-1.0}$      |
| $A_{217}^{\mathrm{PS}}$                  | $104^{+30}_{-30}$               | $D_{40}$                             | $1238^{+58}_{-53}$              | $D_{\mathrm{M}}(0.61)$      | $2282^{+56}_{-56}$        |
| $A_{217}^{\mathrm{CIB}}$                 | $37^{+10}_{-10}$                | $D_{220}$                            | $5721^{+83}_{-82}$              | $H(2.33)$                   | $234.9^{+3.1}_{-3.1}$     |
| $A_{143}^{\mathrm{tSZ}}$                 | $4.2^{+3.6}_{-4.0}$             | $D_{810}$                            | $2525^{+28}_{-28}$              | $D_{\mathrm{M}}(2.33)$      | $5742^{+46}_{-49}$        |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.68^{+0.28}_{-0.26}$          | $D_{1420}$                           | $814^{+10}_{-10}$               | $f\sigma_8(0.15)$           | $0.470^{+0.049}_{-0.045}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $D_{2000}$                           | $232.2^{+4.3}_{-4.4}$           | $\sigma_8(0.15)$            | $0.787^{+0.066}_{-0.058}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $n_{\mathrm{s},0.002}$               | $0.975^{+0.017}_{-0.016}$       | $f\sigma_8(0.38)$           | $0.492^{+0.047}_{-0.041}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}$                     | $0.24547^{+0.00027}_{-0.00025}$ | $\sigma_8(0.38)$            | $0.699^{+0.059}_{-0.050}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.39}_{-0.38}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24680^{+0.00027}_{-0.00025}$ | $f\sigma_8(0.51)$           | $0.492^{+0.045}_{-0.041}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.34}_{-0.35}$          | $10^5 \mathrm{D}/\mathrm{H}$         | $2.55^{+0.11}_{-0.11}$          | $\sigma_8(0.51)$            | $0.655^{+0.055}_{-0.047}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.75^{+0.10}_{-0.11}$         | $f\sigma_8(0.61)$           | $0.488^{+0.043}_{-0.039}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.01^{+0.31}_{-0.32}$          | $z_*$                                | $1089.4^{+1.1}_{-1.1}$          | $\sigma_8(0.61)$            | $0.624^{+0.052}_{-0.045}$ |
| $y_{\mathrm{cal}}$                       | $1.0000^{+0.0048}_{-0.0048}$    | $r_*$                                | $145.0^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | $0.315^{+0.026}_{-0.022}$ |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                        | $1.0415^{+0.0011}_{-0.0010}$    | $\sigma_8(2.33)$            | $0.326^{+0.027}_{-0.023}$ |
| $c_{217}$                                | $1.0008^{+0.0030}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.93^{+0.10}_{-0.10}$         | $f_{2000}^{143}$            | $26^{+7}_{-7}$            |
| $H_0$                                    | $68.7^{+2.6}_{-2.6}$            | $z_{\mathrm{drag}}$                  | $1060.2^{+1.2}_{-1.1}$          | $f_{2000}^{217}$            | $104.4^{+4.9}_{-4.9}$     |
| $\Omega_{\Lambda}$                       | $0.702^{+0.032}_{-0.034}$       | $r_{\mathrm{drag}}$                  | $147.6^{+1.1}_{-1.1}$           | $f_{2000}^{143 \times 217}$ | $29^{+5}_{-5}$            |
| $\Omega_{\mathrm{m}}$                    | $0.298^{+0.034}_{-0.032}$       | $k_{\mathrm{D}}$                     | $0.1404^{+0.0011}_{-0.0010}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7059.9 (\nu: 14.8)$      |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1403^{+0.0050}_{-0.0050}$    | $100\theta_{\mathrm{D}}$             | $0.16066^{+0.00063}_{-0.00062}$ | $\chi_{\mathrm{prior}}^2$   | $7.2 (\nu: 5.4)$          |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0964^{+0.0010}_{-0.00098}$   | $z_{\mathrm{eq}}$                    | $3338^{+120}_{-120}$            |                             |                           |
| $\sigma_8$                               | $0.850^{+0.072}_{-0.063}$       | $k_{\mathrm{eq}}$                    | $0.01019^{+0.00037}_{-0.00036}$ |                             |                           |

$\bar{\chi}_{\mathrm{eff}}^2 = 7067.05$ ;  $R - 1 = 0.01053$



### 3.28 base\_Alens\_CamSpecHM\_TT\_post\_BAO\_zre6p5

| Parameter  | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                                | $0.02248^{+0.00044}_{-0.00044}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.469^{+0.042}_{-0.037}$       | $H(0.15)$                   | $73.4^{+1.1}_{-1.0}$      |
| $\Omega_{\mathrm{c}} h^2$                                | $0.1181^{+0.0026}_{-0.0025}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.631^{+0.054}_{-0.047}$       | $D_{\mathrm{M}}(0.15)$      | $636^{+10}_{-10}$         |
| $100\theta_{\mathrm{MC}}$                                | $1.04123^{+0.00086}_{-0.00087}$ | $\sigma_8/h^{0.5}$                    | $1.030^{+0.087}_{-0.075}$       | $H(0.38)$                   | $83.41^{+0.82}_{-0.79}$   |
| $\tau$   | $0.110^{+0.079}_{-0.068}$       | $r_{\mathrm{drag}} h$                 | $100.6^{+2.0}_{-2.0}$           | $D_{\mathrm{M}}(0.38)$      | $1519^{+21}_{-21}$        |
| $A_{\mathrm{L}}$   | $1.07^{+0.22}_{-0.21}$          | $\langle d^2 \rangle^{1/2}$           | $2.62^{+0.15}_{-0.15}$          | $H(0.51)$                   | $90.04^{+0.68}_{-0.65}$   |
| $\ln(10^{10} A_{\mathrm{s}})$                            | $3.15^{+0.16}_{-0.14}$          | $z_{\mathrm{re}}$                     | $< 18.2$                        | $D_{\mathrm{M}}(0.51)$      | $1969^{+24}_{-25}$        |
| $n_{\mathrm{s}}$   | $0.972^{+0.010}_{-0.0098}$      | $10^9 A_{\mathrm{s}}$                 | $2.34^{+0.38}_{-0.31}$          | $H(0.61)$                   | $95.60^{+0.58}_{-0.55}$   |
| $A_{100}^{\mathrm{PS}}$                                  | $231^{+50}_{-50}$               | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.870^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2292^{+27}_{-27}$        |
| $A_{143}^{\mathrm{PS}}$                                  | $35^{+20}_{-20}$                | $D_{40}$                              | $1242^{+55}_{-46}$              | $H(2.33)$                   | $235.4^{+1.6}_{-1.6}$     |
| $A_{217}^{\mathrm{PS}}$                                  | $104^{+30}_{-30}$               | $D_{220}$                             | $5717^{+81}_{-82}$              | $D_{\mathrm{M}}(2.33)$      | $5750^{+27}_{-28}$        |
| $A_{217}^{\mathrm{CIB}}$                                 | $37^{+10}_{-10}$                | $D_{810}$                             | $2526^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.474^{+0.042}_{-0.037}$ |
| $A_{143}^{\mathrm{tSZ}}$                                 | $4.1^{+3.6}_{-4.0}$             | $D_{1420}$                            | $814^{+10}_{-9.9}$              | $\sigma_8(0.15)$            | $0.787^{+0.065}_{-0.054}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$                       | $0.68^{+0.27}_{-0.26}$          | $D_{2000}$                            | $231.8^{+3.9}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.495^{+0.042}_{-0.037}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$                      | —                               | $n_{\mathrm{s},0.002}$                | $0.972^{+0.010}_{-0.0098}$      | $\sigma_8(0.38)$            | $0.699^{+0.057}_{-0.048}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$                 | —                               | $Y_{\mathrm{P}}$                      | $0.24543^{+0.00018}_{-0.00018}$ | $f\sigma_8(0.51)$           | $0.495^{+0.042}_{-0.036}$ |
| $A^{\mathrm{kSZ}}$                                       | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24676^{+0.00018}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.654^{+0.054}_{-0.045}$ |
| $A_{100}^{\mathrm{dust}}$                                | $0.999^{+0.39}_{-0.38}$         | $10^5 \mathrm{D}/\mathrm{H}$          | $2.566^{+0.083}_{-0.080}$       | $f\sigma_8(0.61)$           | $0.490^{+0.041}_{-0.035}$ |
| $A_{143}^{\mathrm{dust}}$                                | $0.95^{+0.34}_{-0.35}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.769^{+0.062}_{-0.064}$      | $\sigma_8(0.61)$            | $0.623^{+0.051}_{-0.043}$ |
| $A_{217}^{\mathrm{dust}}$                                | $0.98^{+0.20}_{-0.20}$          | $z_*$                                 | $1089.62^{+0.67}_{-0.65}$       | $f\sigma_8(2.33)$           | $0.314^{+0.026}_{-0.021}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$                     | $1.02^{+0.31}_{-0.32}$          | $r_*$                                 | $144.85^{+0.64}_{-0.62}$        | $\sigma_8(2.33)$            | $0.324^{+0.027}_{-0.022}$ |
| $y_{\mathrm{cal}}$                                       | $0.99999^{+0.0049}_{-0.0048}$   | $100\theta_*$                         | $1.04141^{+0.00085}_{-0.00085}$ | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$  | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.909^{+0.063}_{-0.062}$      | $f_{2000}^{217}$            | $104.8^{+4.3}_{-4.3}$     |
| $c_{217}$  | $1.0008^{+0.0030}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1060.05^{+0.95}_{-0.95}$       | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$            |
| $H_0$  | $68.2^{+1.2}_{-1.2}$            | $r_{\mathrm{drag}}$                   | $147.49^{+0.69}_{-0.69}$        | $\chi_{\mathrm{CamSpec}}^2$ | $7059.1 (\nu: 13.9)$      |
| $\Omega_{\Lambda}$                                       | $0.697^{+0.015}_{-0.015}$       | $k_{\mathrm{D}}$                      | $0.14053^{+0.00092}_{-0.00091}$ | $\chi_{6\mathrm{DF}}^2$     | $0.046 (\nu: 0.0)$        |
| $\Omega_{\mathrm{m}}$                                    | $0.303^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{D}}$              | $0.16072^{+0.00055}_{-0.00054}$ | $\chi_{\mathrm{MGS}}^2$     | $1.87 (\nu: 0.2)$         |
| $\Omega_{\mathrm{m}} h^2$                                | $0.1412^{+0.0024}_{-0.0024}$    | $z_{\mathrm{eq}}$                     | $3358^{+58}_{-58}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.1 (\nu: 0.5)$          |
| $\Omega_{\mathrm{m}} h^3$                                | $0.0963^{+0.0010}_{-0.00097}$   | $k_{\mathrm{eq}}$                     | $0.01025^{+0.00018}_{-0.00018}$ | $\chi_{\mathrm{prior}}^2$   | $7.2 (\nu: 5.4)$          |
| $\sigma_8$   | $0.851^{+0.070}_{-0.059}$       | $100\theta_{\mathrm{eq}}$             | $0.822^{+0.011}_{-0.011}$       | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.7)$          |
| $S_8$  | $0.855^{+0.077}_{-0.068}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4537^{+0.0057}_{-0.0056}$    |                             |                           |
| $\bar{\chi}_{\mathrm{eff}}^2 = 7072.34; R - 1 = 0.01270$ |                                 |                                       |                                 |                             |                           |



### 3.29 base\_Alens\_CamSpecHM\_TT\_lowl

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.02267  | $0.02266^{+0.00059}_{-0.00058}$ | $S_8$                          | 0.756    | $0.793^{+0.077}_{-0.068}$       | $100\theta_{\text{eq}}$     | 0.8283   | $0.830^{+0.022}_{-0.022}$ |
| $\Omega_c h^2$                       | 0.11654  | $0.1162^{+0.0050}_{-0.0050}$    | $\sigma_8 \Omega_m^{0.5}$      | 0.4139   | $0.434^{+0.042}_{-0.037}$       | $100\theta_{\text{s,eq}}$   | 0.4570   | $0.458^{+0.011}_{-0.011}$ |
| $100\theta_{\text{MC}}$              | 1.04148  | $1.0415^{+0.0011}_{-0.0010}$    | $\sigma_8 \Omega_m^{0.25}$     | 0.5623   | $0.591^{+0.047}_{-0.043}$       | $H(0.15)$                   | 74.11    | $74.2^{+2.1}_{-2.1}$      |
| $\tau$                               | 0.010    | $< 0.131$                       | $\sigma_8/h^{0.5}$             | 0.919    | $0.967^{+0.075}_{-0.066}$       | $D_{\text{M}}(0.15)$        | 629.4    | $628^{+20}_{-20}$         |
| $A_{\text{L}}$                       | 1.362    | $1.22^{+0.24}_{-0.23}$          | $r_{\text{drag}} h$            | 101.93   | $102.2^{+4.2}_{-4.1}$           | $H(0.38)$                   | 83.92    | $84.0^{+1.6}_{-1.5}$      |
| $\ln(10^{10} A_{\text{s}})$          | 2.947    | $3.05^{+0.14}_{-0.11}$          | $\langle d^2 \rangle^{1/2}$    | 2.652    | $2.64^{+0.15}_{-0.15}$          | $D_{\text{M}}(0.38)$        | 1505.3   | $1503^{+41}_{-40}$        |
| $n_{\text{s}}$                       | 0.9760   | $0.977^{+0.016}_{-0.015}$       | $z_{\text{re}}$                | 2.1      | $8.1^{+6.3}_{-5.9}$             | $H(0.51)$                   | 90.46    | $90.5^{+1.3}_{-1.2}$      |
| $y_{\text{cal}}$                     | 1.00006  | $1.0000^{+0.0048}_{-0.0048}$    | $10^9 A_{\text{s}}$            | 1.905    | $2.12^{+0.31}_{-0.23}$          | $D_{\text{M}}(0.51)$        | 1952.8   | $1950^{+48}_{-48}$        |
| $A_{100}^{\text{PS}}$                | 218      | $228^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8667   | $1.863^{+0.029}_{-0.029}$       | $H(0.61)$                   | 95.94    | $96.0^{+1.1}_{-0.99}$     |
| $A_{143}^{\text{PS}}$                | 45.1     | $33^{+20}_{-20}$                | $D_{40}$                       | 1197.5   | $1209^{+39}_{-37}$              | $D_{\text{M}}(0.61)$        | 2275     | $2272^{+51}_{-52}$        |
| $A_{217}^{\text{PS}}$                | 108.8    | $105^{+20}_{-30}$               | $D_{220}$                      | 5732     | $5726^{+83}_{-81}$              | $H(2.33)$                   | 234.64   | $234.4^{+2.9}_{-2.8}$     |
| $A_{217}^{\text{CIB}}$               | 37.6     | $36^{+10}_{-10}$                | $D_{810}$                      | 2527.5   | $2524^{+27}_{-28}$              | $D_{\text{M}}(2.33)$        | 5735.1   | $5734^{+44}_{-46}$        |
| $A_{143}^{\text{tSZ}}$               | 6.32     | $4.2^{+3.6}_{-4.1}$             | $D_{1420}$                     | 815.5    | $815^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4195   | $0.440^{+0.041}_{-0.036}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.793    | $0.68^{+0.28}_{-0.26}$          | $D_{2000}$                     | 232.95   | $232.6^{+4.2}_{-4.2}$           | $\sigma_8(0.15)$            | 0.7076   | $0.745^{+0.054}_{-0.044}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.77     | —                               | $n_{\text{s},0.002}$           | 0.9760   | $0.977^{+0.016}_{-0.015}$       | $f\sigma_8(0.38)$           | 0.4406   | $0.463^{+0.038}_{-0.035}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.999    | —                               | $Y_{\text{P}}$                 | 0.245506 | $0.24551^{+0.00026}_{-0.00023}$ | $\sigma_8(0.38)$            | 0.6291   | $0.662^{+0.048}_{-0.038}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}^{\text{BBN}}$    | 0.246833 | $0.24684^{+0.00026}_{-0.00023}$ | $f\sigma_8(0.51)$           | 0.4413   | $0.464^{+0.037}_{-0.033}$ |
| $A_{100}^{\text{dust}}$              | 1.008    | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D}/\text{H}$       | 2.532    | $2.53^{+0.11}_{-0.10}$          | $\sigma_8(0.51)$            | 0.5895   | $0.621^{+0.045}_{-0.035}$ |
| $A_{143}^{\text{dust}}$              | 0.962    | $0.95^{+0.34}_{-0.34}$          | $\text{Age}/\text{Gyr}$        | 13.735   | $13.733^{+0.098}_{-0.10}$       | $f\sigma_8(0.61)$           | 0.4380   | $0.460^{+0.035}_{-0.031}$ |
| $A_{217}^{\text{dust}}$              | 0.988    | $0.98^{+0.20}_{-0.20}$          | $z_*$                          | 1089.24  | $1089.2^{+1.1}_{-1.0}$          | $\sigma_8(0.61)$            | 0.5614   | $0.591^{+0.042}_{-0.034}$ |
| $A_{143 \times 217}^{\text{dust}}$   | 1.016    | $1.01^{+0.31}_{-0.32}$          | $r_*$                          | 145.10   | $145.2^{+1.1}_{-1.0}$           | $f\sigma_8(2.33)$           | 0.2838   | $0.299^{+0.021}_{-0.017}$ |
| $c_{100}$                            | 0.99790  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                  | 1.04163  | $1.0417^{+0.0010}_{-0.0010}$    | $\sigma_8(2.33)$            | 0.2934   | $0.309^{+0.022}_{-0.017}$ |
| $c_{217}$                            | 1.00088  | $1.0007^{+0.0031}_{-0.0030}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.930   | $13.940^{+0.096}_{-0.094}$      | $f_{2000}^{143}$            | 25.7     | $26^{+7}_{-7}$            |
| $H_0$                                | 69.02    | $69.2^{+2.5}_{-2.4}$            | $z_{\text{drag}}$              | 1060.39  | $1060.3^{+1.1}_{-1.1}$          | $f_{2000}^{217}$            | 103.69   | $104.0^{+4.8}_{-4.8}$     |
| $\Omega_{\Lambda}$                   | 0.7064   | $0.708^{+0.029}_{-0.031}$       | $r_{\text{drag}}$              | 147.67   | $147.8^{+1.0}_{-0.99}$          | $f_{2000}^{143 \times 217}$ | 28.9     | $29^{+5}_{-5}$            |
| $\Omega_{\text{m}}$                  | 0.2936   | $0.292^{+0.031}_{-0.029}$       | $k_{\text{D}}$                 | 0.14048  | $0.1403^{+0.0010}_{-0.0010}$    | $\chi_{\text{lowl}}^2$      | 20.86    | $22.0 (\nu: 1.1)$         |
| $\Omega_{\text{m}} h^2$              | 0.13986  | $0.1395^{+0.0046}_{-0.0046}$    | $100\theta_{\text{D}}$         | 0.16054  | $0.16059^{+0.00061}_{-0.00059}$ | $\chi_{\text{CamSpec}}^2$   | 7046.1   | $7060.0 (\nu: 14.2)$      |
| $\Omega_{\text{m}} h^3$              | 0.09653  | $0.0965^{+0.0010}_{-0.00099}$   | $z_{\text{eq}}$                | 3327     | $3318^{+110}_{-110}$            | $\chi_{\text{prior}}^2$     | 1.4      | $7.2 (\nu: 5.3)$          |
| $\sigma_8$                           | 0.764    | $0.804^{+0.059}_{-0.049}$       | $k_{\text{eq}}$                | 0.010154 | $0.01013^{+0.00034}_{-0.00033}$ | $\chi_{\text{CMB}}^2$       | 7066.9   | $7082.0 (\nu: 14.2)$      |

Best-fit  $\chi_{\text{eff}}^2 = 7068.30$ ;  $\Delta\chi_{\text{eff}}^2 = -3.99$ ;  $\bar{\chi}_{\text{eff}}^2 = 7089.14$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -3.10$ ;  $R - 1 = 0.00730$   
 $\chi_{\text{eff}}^2$ : CMB - commander\_dx12\_v3\_2\_29: 20.86 ( $\Delta$  -3.64) CamSpec like\_10.7HM: 7046.06 ( $\Delta$  -0.32)



### 3.30 base\_Alens\_CamSpecHM\_TT\_lowl\_post\_BAO

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$              | $0.02251^{+0.00044}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.597^{+0.042}_{-0.035}$       | $H(0.38)$                   | $83.49^{+0.80}_{-0.78}$   |
| $\Omega_c h^2$              | $0.1178^{+0.0026}_{-0.0025}$    | $\sigma_8/h^{0.5}$          | $0.974^{+0.068}_{-0.055}$       | $D_M(0.38)$                 | $1516^{+20}_{-20}$        |
| $100\theta_{MC}$            | $1.04128^{+0.00084}_{-0.00082}$ | $r_{drag}h$                 | $100.9^{+2.0}_{-2.0}$           | $H(0.51)$                   | $90.12^{+0.67}_{-0.65}$   |
| $\tau$                      | $< 0.120$                       | $\langle d^2 \rangle^{1/2}$ | $2.63^{+0.15}_{-0.15}$          | $D_M(0.51)$                 | $1966^{+24}_{-24}$        |
| $A_L$                       | $1.20^{+0.20}_{-0.21}$          | $z_{re}$                    | $7.6^{+6.1}_{-5.5}$             | $H(0.61)$                   | $95.66^{+0.58}_{-0.55}$   |
| $\ln(10^{10} A_s)$          | $3.04^{+0.13}_{-0.10}$          | $10^9 A_s$                  | $2.10^{+0.28}_{-0.21}$          | $D_M(0.61)$                 | $2289^{+26}_{-26}$        |
| $n_s$                       | $0.9723^{+0.0094}_{-0.0093}$    | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.022}_{-0.022}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.5}$     |
| $y_{cal}$                   | $1.0000^{+0.0047}_{-0.0047}$    | $D_{40}$                    | $1216^{+32}_{-31}$              | $D_M(2.33)$                 | $5747^{+27}_{-28}$        |
| $A_{100}^{PS}$              | $230^{+50}_{-50}$               | $D_{220}$                   | $5718^{+80}_{-78}$              | $f\sigma_8(0.15)$           | $0.448^{+0.033}_{-0.028}$ |
| $A_{143}^{PS}$              | $34^{+20}_{-20}$                | $D_{810}$                   | $2526^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.745^{+0.050}_{-0.039}$ |
| $A_{217}^{PS}$              | $104^{+20}_{-30}$               | $D_{1420}$                  | $813.8^{+9.9}_{-10}$            | $f\sigma_8(0.38)$           | $0.468^{+0.033}_{-0.028}$ |
| $A_{217}^{CIB}$             | $37^{+10}_{-10}$                | $D_{2000}$                  | $231.9^{+3.7}_{-3.8}$           | $\sigma_8(0.38)$            | $0.662^{+0.044}_{-0.034}$ |
| $A_{143}^{tSZ}$             | $4.1^{+3.6}_{-4.0}$             | $n_{s,0.002}$               | $0.9723^{+0.0094}_{-0.0093}$    | $f\sigma_8(0.51)$           | $0.468^{+0.033}_{-0.027}$ |
| $r_{143 \times 217}^{PS}$   | $0.68^{+0.27}_{-0.25}$          | $Y_P$                       | $0.24545^{+0.00018}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.620^{+0.041}_{-0.031}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24678^{+0.00018}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.464^{+0.032}_{-0.026}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.560^{+0.082}_{-0.080}$       | $\sigma_8(0.61)$            | $0.590^{+0.039}_{-0.030}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.763^{+0.062}_{-0.063}$      | $f\sigma_8(2.33)$           | $0.298^{+0.020}_{-0.015}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1089.55^{+0.66}_{-0.66}$       | $\sigma_8(2.33)$            | $0.308^{+0.021}_{-0.016}$ |
| $A_{143}^{dust}$            | $0.95^{+0.34}_{-0.35}$          | $r_*$                       | $144.89^{+0.62}_{-0.62}$        | $f_{2000}^{143}$            | $27^{+7}_{-6}$            |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04145^{+0.00083}_{-0.00081}$ | $f_{2000}^{217}$            | $104.7^{+4.5}_{-4.3}$     |
| $A_{143 \times 217}^{dust}$ | $1.01^{+0.31}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $13.912^{+0.061}_{-0.061}$      | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$            |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1060.11^{+0.97}_{-0.98}$       | $\chi_{lowl}^2$             | $22.4 (\nu: 1.0)$         |
| $c_{217}$                   | $1.0009^{+0.0031}_{-0.0030}$    | $r_{drag}$                  | $147.51^{+0.69}_{-0.67}$        | $\chi_{CamSpec}^2$          | $7058.9 (\nu: 13.0)$      |
| $H_0$                       | $68.4^{+1.2}_{-1.2}$            | $k_D$                       | $0.14053^{+0.00089}_{-0.00092}$ | $\chi_{6DF}^2$              | $0.049 (\nu: 0.0)$        |
| $\Omega_\Lambda$            | $0.698^{+0.015}_{-0.015}$       | $100\theta_D$               | $0.16069^{+0.00056}_{-0.00054}$ | $\chi_{MGS}^2$              | $2.00 (\nu: 0.2)$         |
| $\Omega_m$                  | $0.302^{+0.015}_{-0.015}$       | $z_{eq}$                    | $3353^{+57}_{-57}$              | $\chi_{DR12BAO}^2$          | $4.05 (\nu: 0.5)$         |
| $\Omega_m h^2$              | $0.1410^{+0.0024}_{-0.0024}$    | $k_{eq}$                    | $0.01023^{+0.00018}_{-0.00017}$ | $\chi_{prior}^2$            | $7.2 (\nu: 5.3)$          |
| $\Omega_m h^3$              | $0.09638^{+0.00099}_{-0.00096}$ | $100\theta_{eq}$            | $0.823^{+0.011}_{-0.011}$       | $\chi_{BAO}^2$              | $6.1 (\nu: 0.8)$          |
| $\sigma_8$                  | $0.806^{+0.055}_{-0.042}$       | $100\theta_{s,eq}$          | $0.4543^{+0.0057}_{-0.0056}$    | $\chi_{CMB}^2$              | $7081.3 (\nu: 13.5)$      |
| $S_8$                       | $0.808^{+0.061}_{-0.052}$       | $H(0.15)$                   | $73.6^{+1.0}_{-1.0}$            |                             |                           |
| $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.033}_{-0.029}$       | $D_M(0.15)$                 | $635^{+10}_{-10}$               |                             |                           |

$$\bar{\chi}_{eff}^2 = 7094.64; \Delta \bar{\chi}_{eff}^2 = -2.98; R - 1 = 0.01645$$



### 3.31 base\_Alens\_CamSpecHM\_TT\_lowl\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|--------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02268^{+0.00059}_{-0.00059}$ | $S_8$                          | $0.806^{+0.072}_{-0.065}$       | $100\theta_{\text{eq}}$     | $0.832^{+0.022}_{-0.022}$ |
| $\Omega_c h^2$                       | $0.1159^{+0.0050}_{-0.0049}$    | $\sigma_8 \Omega_m^{0.5}$      | $0.441^{+0.040}_{-0.035}$       | $100\theta_{\text{s,eq}}$   | $0.459^{+0.011}_{-0.011}$ |
| $100\theta_{\text{MC}}$              | $1.0415^{+0.0011}_{-0.0010}$    | $\sigma_8 \Omega_m^{0.25}$     | $0.601^{+0.042}_{-0.039}$       | $H(0.15)$                   | $74.4^{+2.1}_{-2.1}$      |
| $\tau$                               | $0.084^{+0.057}_{-0.042}$       | $\sigma_8/h^{0.5}$             | $0.985^{+0.066}_{-0.059}$       | $D_{\text{M}}(0.15)$        | $627^{+20}_{-20}$         |
| $A_{\text{L}}$                       | $1.18^{+0.21}_{-0.21}$          | $r_{\text{drag}} h$            | $102.5^{+4.2}_{-4.1}$           | $H(0.38)$                   | $84.1^{+1.6}_{-1.5}$      |
| $\ln(10^{10} A_{\text{s}})$          | $3.09^{+0.11}_{-0.086}$         | $\langle d^2 \rangle^{1/2}$    | $2.64^{+0.15}_{-0.15}$          | $D_{\text{M}}(0.38)$        | $1501^{+41}_{-40}$        |
| $n_{\text{s}}$                       | $0.978^{+0.015}_{-0.015}$       | $z_{\text{re}}$                | $< 14.7$                        | $H(0.51)$                   | $90.6^{+1.3}_{-1.2}$      |
| $y_{\text{cal}}$                     | $1.0000^{+0.0048}_{-0.0049}$    | $10^9 A_{\text{s}}$            | $2.21^{+0.26}_{-0.19}$          | $D_{\text{M}}(0.51)$        | $1947^{+48}_{-47}$        |
| $A_{100}^{\text{PS}}$                | $227^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.861^{+0.028}_{-0.029}$       | $H(0.61)$                   | $96.0^{+1.1}_{-1.0}$      |
| $A_{143}^{\text{PS}}$                | $32^{+20}_{-20}$                | $D_{40}$                       | $1213^{+40}_{-37}$              | $D_{\text{M}}(0.61)$        | $2269^{+52}_{-52}$        |
| $A_{217}^{\text{PS}}$                | $105^{+20}_{-30}$               | $D_{220}$                      | $5725^{+84}_{-82}$              | $H(2.33)$                   | $234.2^{+2.9}_{-2.8}$     |
| $A_{217}^{\text{CIB}}$               | $36^{+10}_{-10}$                | $D_{810}$                      | $2524^{+27}_{-27}$              | $D_{\text{M}}(2.33)$        | $5731^{+45}_{-46}$        |
| $A_{143}^{\text{tSZ}}$               | $4.2^{+3.6}_{-4.1}$             | $D_{1420}$                     | $815^{+10}_{-10}$               | $f\sigma_8(0.15)$           | $0.448^{+0.038}_{-0.034}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.69^{+0.28}_{-0.26}$          | $D_{2000}$                     | $232.8^{+4.2}_{-4.2}$           | $\sigma_8(0.15)$            | $0.760^{+0.045}_{-0.037}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$           | $0.978^{+0.015}_{-0.015}$       | $f\sigma_8(0.38)$           | $0.471^{+0.034}_{-0.032}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                 | $0.24552^{+0.00026}_{-0.00024}$ | $\sigma_8(0.38)$            | $0.676^{+0.040}_{-0.032}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$    | $0.24684^{+0.00026}_{-0.00024}$ | $f\sigma_8(0.51)$           | $0.472^{+0.032}_{-0.030}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $10^5 \text{D/H}$              | $2.53^{+0.11}_{-0.10}$          | $\sigma_8(0.51)$            | $0.634^{+0.037}_{-0.029}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.34}$          | $\text{Age/Gyr}$               | $13.73^{+0.10}_{-0.10}$         | $f\sigma_8(0.61)$           | $0.469^{+0.031}_{-0.028}$ |
| $A_{217}^{\text{dust}}$              | $0.99^{+0.20}_{-0.20}$          | $z_*$                          | $1089.2^{+1.1}_{-1.0}$          | $\sigma_8(0.61)$            | $0.603^{+0.035}_{-0.027}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.31}_{-0.32}$          | $r_*$                          | $145.3^{+1.0}_{-1.0}$           | $f\sigma_8(2.33)$           | $0.305^{+0.018}_{-0.013}$ |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                  | $1.0417^{+0.0010}_{-0.0010}$    | $\sigma_8(2.33)$            | $0.316^{+0.019}_{-0.014}$ |
| $c_{217}$                            | $1.0007^{+0.0030}_{-0.0030}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.946^{+0.094}_{-0.094}$      | $f_{2000}^{143}$            | $25^{+7}_{-7}$            |
| $H_0$                                | $69.3^{+2.4}_{-2.4}$            | $z_{\text{drag}}$              | $1060.4^{+1.1}_{-1.2}$          | $f_{2000}^{217}$            | $103.8^{+4.8}_{-4.7}$     |
| $\Omega_{\Lambda}$                   | $0.710^{+0.028}_{-0.031}$       | $r_{\text{drag}}$              | $147.85^{+0.99}_{-0.98}$        | $f_{2000}^{143 \times 217}$ | $29^{+5}_{-5}$            |
| $\Omega_{\text{m}}$                  | $0.290^{+0.031}_{-0.028}$       | $k_{\text{D}}$                 | $0.1403^{+0.0010}_{-0.0010}$    | $\chi_{\text{lowl}}^2$      | $22.4 (\nu: 1.3)$         |
| $\Omega_{\text{m}} h^2$              | $0.1392^{+0.0047}_{-0.0045}$    | $100\theta_{\text{D}}$         | $0.16057^{+0.00062}_{-0.00059}$ | $\chi_{\text{CamSpec}}^2$   | $7059.9 (\nu: 14.4)$      |
| $\Omega_{\text{m}} h^3$              | $0.09646^{+0.00099}_{-0.00099}$ | $z_{\text{eq}}$                | $3311^{+110}_{-110}$            | $\chi_{\text{prior}}^2$     | $7.2 (\nu: 5.4)$          |
| $\sigma_8$                           | $0.820^{+0.050}_{-0.042}$       | $k_{\text{eq}}$                | $0.01011^{+0.00034}_{-0.00033}$ | $\chi_{\text{CMB}}^2$       | $7082.3 (\nu: 14.4)$      |

$\bar{\chi}_{\text{eff}}^2 = 7089.50$ ;  $\Delta \bar{\chi}_{\text{eff}}^2 = -2.64$ ;  $R - 1 = 0.00995$



### 3.32 base\_Alens\_CamSpecHM\_TT\_lowl\_post\_BAO\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$              | $0.02252^{+0.00044}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.610^{+0.036}_{-0.029}$       | $H(0.38)$                   | $83.51^{+0.80}_{-0.77}$   |
| $\Omega_c h^2$              | $0.1177^{+0.0025}_{-0.0025}$    | $\sigma_8/h^{0.5}$          | $0.995^{+0.057}_{-0.046}$       | $D_M(0.38)$                 | $1516^{+21}_{-20}$        |
| $100\theta_{MC}$            | $1.04128^{+0.00083}_{-0.00082}$ | $r_{drag}h$                 | $100.9^{+2.0}_{-2.0}$           | $H(0.51)$                   | $90.13^{+0.66}_{-0.63}$   |
| $\tau$                      | $0.079^{+0.051}_{-0.037}$       | $\langle d^2 \rangle^{1/2}$ | $2.63^{+0.15}_{-0.15}$          | $D_M(0.51)$                 | $1965^{+24}_{-24}$        |
| $A_L$                       | $1.15^{+0.18}_{-0.18}$          | $z_{re}$                    | $< 14.1$                        | $H(0.61)$                   | $95.67^{+0.57}_{-0.55}$   |
| $\ln(10^{10} A_s)$          | $3.09^{+0.10}_{-0.076}$         | $10^9 A_s$                  | $2.19^{+0.23}_{-0.17}$          | $D_M(0.61)$                 | $2288^{+26}_{-26}$        |
| $n_s$                       | $0.9730^{+0.0093}_{-0.0090}$    | $10^9 A_s e^{-2\tau}$       | $1.869^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.2^{+1.6}_{-1.5}$     |
| $y_{cal}$                   | $0.99998^{+0.0047}_{-0.0049}$   | $D_{40}$                    | $1221^{+33}_{-32}$              | $D_M(2.33)$                 | $5747^{+27}_{-27}$        |
| $A_{100}^{PS}$              | $229^{+50}_{-50}$               | $D_{220}$                   | $5715^{+81}_{-79}$              | $f\sigma_8(0.15)$           | $0.457^{+0.029}_{-0.025}$ |
| $A_{143}^{PS}$              | $34^{+20}_{-20}$                | $D_{810}$                   | $2526^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.761^{+0.041}_{-0.031}$ |
| $A_{217}^{PS}$              | $105^{+20}_{-30}$               | $D_{1420}$                  | $813.9^{+9.8}_{-10}$            | $f\sigma_8(0.38)$           | $0.478^{+0.028}_{-0.024}$ |
| $A_{217}^{CIB}$             | $37^{+10}_{-10}$                | $D_{2000}$                  | $232.0^{+3.7}_{-3.8}$           | $\sigma_8(0.38)$            | $0.676^{+0.036}_{-0.027}$ |
| $A_{143}^{tSZ}$             | $4.1^{+3.6}_{-4.1}$             | $n_{s,0.002}$               | $0.9730^{+0.0093}_{-0.0090}$    | $f\sigma_8(0.51)$           | $0.478^{+0.028}_{-0.023}$ |
| $r_{143 \times 217}^{PS}$   | $0.68^{+0.27}_{-0.25}$          | $Y_P$                       | $0.24545^{+0.00018}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.633^{+0.034}_{-0.025}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24678^{+0.00018}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.474^{+0.027}_{-0.022}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.560^{+0.082}_{-0.079}$       | $\sigma_8(0.61)$            | $0.603^{+0.032}_{-0.024}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.762^{+0.061}_{-0.062}$      | $f\sigma_8(2.33)$           | $0.304^{+0.016}_{-0.012}$ |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.37}$          | $z_*$                       | $1089.54^{+0.65}_{-0.64}$       | $\sigma_8(2.33)$            | $0.314^{+0.017}_{-0.012}$ |
| $A_{143}^{dust}$            | $0.95^{+0.35}_{-0.35}$          | $r_*$                       | $144.91^{+0.62}_{-0.63}$        | $f_{2000}^{143}$            | $26^{+6}_{-6}$            |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04145^{+0.00082}_{-0.00080}$ | $f_{2000}^{217}$            | $104.6^{+4.4}_{-4.3}$     |
| $A_{143 \times 217}^{dust}$ | $1.01^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $13.915^{+0.060}_{-0.061}$      | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$            |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1060.10^{+0.97}_{-0.97}$       | $\chi_{lowl}^2$             | $23.0 (\nu: 1.1)$         |
| $c_{217}$                   | $1.0008^{+0.0030}_{-0.0030}$    | $r_{drag}$                  | $147.54^{+0.68}_{-0.67}$        | $\chi_{CamSpec}^2$          | $7058.7 (\nu: 13.3)$      |
| $H_0$                       | $68.4^{+1.2}_{-1.2}$            | $k_D$                       | $0.14050^{+0.00089}_{-0.00092}$ | $\chi_{6DF}^2$              | $0.051 (\nu: 0.0)$        |
| $\Omega_\Lambda$            | $0.699^{+0.015}_{-0.015}$       | $100\theta_D$               | $0.16069^{+0.00057}_{-0.00054}$ | $\chi_{MGS}^2$              | $2.05 (\nu: 0.2)$         |
| $\Omega_m$                  | $0.301^{+0.015}_{-0.015}$       | $z_{eq}$                    | $3351^{+57}_{-56}$              | $\chi_{DR12BAO}^2$          | $4.04 (\nu: 0.5)$         |
| $\Omega_m h^2$              | $0.1409^{+0.0024}_{-0.0023}$    | $k_{eq}$                    | $0.01023^{+0.00017}_{-0.00017}$ | $\chi_{prior}^2$            | $7.3 (\nu: 5.5)$          |
| $\Omega_m h^3$              | $0.09636^{+0.00095}_{-0.00095}$ | $100\theta_{eq}$            | $0.823^{+0.011}_{-0.011}$       | $\chi_{BAO}^2$              | $6.1 (\nu: 0.8)$          |
| $\sigma_8$                  | $0.823^{+0.045}_{-0.035}$       | $100\theta_{s,eq}$          | $0.4545^{+0.0056}_{-0.0055}$    | $\chi_{CMB}^2$              | $7081.7 (\nu: 13.8)$      |
| $S_8$                       | $0.824^{+0.053}_{-0.046}$       | $H(0.15)$                   | $73.6^{+1.1}_{-1.0}$            |                             |                           |
| $\sigma_8 \Omega_m^{0.5}$   | $0.452^{+0.029}_{-0.025}$       | $D_M(0.15)$                 | $635^{+10}_{-10}$               |                             |                           |

$\bar{\chi}_{eff}^2 = 7095.11$ ;  $\Delta\bar{\chi}_{eff}^2 = -2.46$ ;  $R - 1 = 0.02149$



### 3.33 base\_Alens\_CamSpecHM\_TT\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.02255  | $0.02253^{+0.00061}_{-0.00059}$ | $S_8$                          | 0.798    | $0.800^{+0.064}_{-0.062}$       | $100\theta_{\text{eq}}$     | 0.8245   | $0.823^{+0.023}_{-0.023}$    |
| $\Omega_c h^2$                       | 0.1174   | $0.1177^{+0.0054}_{-0.0052}$    | $\sigma_8 \Omega_m^{0.5}$      | 0.4370   | $0.438^{+0.035}_{-0.034}$       | $100\theta_{\text{s,eq}}$   | 0.4551   | $0.455^{+0.012}_{-0.012}$    |
| $100\theta_{\text{MC}}$              | 1.04132  | $1.0413^{+0.0011}_{-0.0011}$    | $\sigma_8 \Omega_m^{0.25}$     | 0.5909   | $0.592^{+0.031}_{-0.031}$       | $H(0.15)$                   | 73.71    | $73.6^{+2.2}_{-2.2}$         |
| $\tau$                               | 0.0509   | $0.050^{+0.016}_{-0.017}$       | $\sigma_8/h^{0.5}$             | 0.9649   | $0.966^{+0.043}_{-0.043}$       | $D_{\text{M}}(0.15)$        | 633.3    | $634^{+22}_{-21}$            |
| $A_{\text{L}}$                       | 1.222    | $1.21^{+0.20}_{-0.18}$          | $r_{\text{drag}} h$            | 101.16   | $101.0^{+4.4}_{-4.3}$           | $H(0.38)$                   | 83.61    | $83.6^{+1.7}_{-1.6}$         |
| $\ln(10^{10} A_{\text{s}})$          | 3.0305   | $3.030^{+0.034}_{-0.037}$       | $\langle d^2 \rangle^{1/2}$    | 2.638    | $2.63^{+0.15}_{-0.15}$          | $D_{\text{M}}(0.38)$        | 1513.2   | $1515^{+43}_{-43}$           |
| $n_{\text{s}}$                       | 0.9728   | $0.971^{+0.016}_{-0.016}$       | $z_{\text{re}}$                | 7.25     | $7.2^{+1.7}_{-1.8}$             | $H(0.51)$                   | 90.20    | $90.2^{+1.4}_{-1.3}$         |
| $y_{\text{cal}}$                     | 0.99998  | $1.0001^{+0.0049}_{-0.0049}$    | $10^9 A_{\text{s}}$            | 2.071    | $2.069^{+0.071}_{-0.075}$       | $D_{\text{M}}(0.51)$        | 1962     | $1965^{+51}_{-50}$           |
| $A_{100}^{\text{PS}}$                | 221      | $232^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8702   | $1.870^{+0.030}_{-0.030}$       | $H(0.61)$                   | 95.73    | $95.7^{+1.1}_{-1.0}$         |
| $A_{143}^{\text{PS}}$                | 47.8     | $35^{+20}_{-20}$                | $D_{40}$                       | 1210.9   | $1214^{+38}_{-37}$              | $D_{\text{M}}(0.61)$        | 2285     | $2287^{+55}_{-55}$           |
| $A_{217}^{\text{PS}}$                | 107.6    | $103^{+30}_{-30}$               | $D_{220}$                      | 5729     | $5729^{+83}_{-83}$              | $H(2.33)$                   | 235.09   | $235.2^{+3.1}_{-3.0}$        |
| $A_{217}^{\text{CIB}}$               | 38.9     | $38^{+10}_{-10}$                | $D_{810}$                      | 2528.0   | $2526^{+28}_{-28}$              | $D_{\text{M}}(2.33)$        | 5744.3   | $5746^{+46}_{-48}$           |
| $A_{143}^{\text{tSZ}}$               | 6.40     | $< 7.62$                        | $D_{1420}$                     | 814.5    | $813^{+10}_{-10}$               | $f\sigma_8(0.15)$           | 0.4425   | $0.444^{+0.033}_{-0.032}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.773    | $0.67^{+0.27}_{-0.26}$          | $D_{2000}$                     | 232.22   | $231.7^{+4.2}_{-4.4}$           | $\sigma_8(0.15)$            | 0.7394   | $0.739^{+0.018}_{-0.020}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.85     | —                               | $n_{\text{s},0.002}$           | 0.9728   | $0.971^{+0.016}_{-0.016}$       | $f\sigma_8(0.38)$           | 0.4633   | $0.464^{+0.026}_{-0.026}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 1.00     | —                               | $Y_{\text{P}}$                 | 0.245464 | $0.24546^{+0.00026}_{-0.00024}$ | $\sigma_8(0.38)$            | 0.6568   | $0.656^{+0.014}_{-0.015}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}^{\text{BBN}}$    | 0.246791 | $0.24678^{+0.00026}_{-0.00025}$ | $f\sigma_8(0.51)$           | 0.4633   | $0.464^{+0.022}_{-0.023}$    |
| $A_{100}^{\text{dust}}$              | 1.003    | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D}/\text{H}$       | 2.552    | $2.56^{+0.11}_{-0.11}$          | $\sigma_8(0.51)$            | 0.6152   | $0.615^{+0.012}_{-0.013}$    |
| $A_{143}^{\text{dust}}$              | 0.969    | $0.96^{+0.34}_{-0.35}$          | Age/Gyr                        | 13.756   | $13.76^{+0.10}_{-0.10}$         | $f\sigma_8(0.61)$           | 0.4594   | $0.460^{+0.019}_{-0.020}$    |
| $A_{217}^{\text{dust}}$              | 0.985    | $0.98^{+0.20}_{-0.20}$          | $z_*$                          | 1089.47  | $1089.5^{+1.1}_{-1.1}$          | $\sigma_8(0.61)$            | 0.5857   | $0.585^{+0.011}_{-0.012}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.003    | $1.02^{+0.32}_{-0.31}$          | $r_*$                          | 144.96   | $144.9^{+1.1}_{-1.1}$           | $f\sigma_8(2.33)$           | 0.2958   | $0.2955^{+0.0053}_{-0.0056}$ |
| $c_{100}$                            | 0.99793  | $0.9976^{+0.0020}_{-0.0021}$    | $100\theta_*$                  | 1.04149  | $1.0415^{+0.0010}_{-0.0011}$    | $\sigma_8(2.33)$            | 0.3055   | $0.3052^{+0.0054}_{-0.0057}$ |
| $c_{217}$                            | 1.00095  | $1.0009^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.918   | $13.914^{+0.098}_{-0.10}$       | $f_{2000}^{143}$            | 27.0     | $27^{+7}_{-7}$               |
| $H_0$                                | 68.55    | $68.4^{+2.6}_{-2.5}$            | $z_{\text{drag}}$              | 1060.16  | $1060.1^{+1.1}_{-1.1}$          | $f_{2000}^{217}$            | 104.33   | $105.0^{+4.8}_{-4.8}$        |
| $\Omega_{\Lambda}$                   | 0.7007   | $0.699^{+0.031}_{-0.034}$       | $r_{\text{drag}}$              | 147.57   | $147.5^{+1.0}_{-1.1}$           | $f_{2000}^{143 \times 217}$ | 29.7     | $30^{+5}_{-5}$               |
| $\Omega_{\text{m}}$                  | 0.2993   | $0.301^{+0.034}_{-0.031}$       | $k_{\text{D}}$                 | 0.14050  | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{\text{simall}}^2$    | 395.67   | $396.8 (\nu: 1.2)$           |
| $\Omega_{\text{m}} h^2$              | 0.14063  | $0.1409^{+0.0050}_{-0.0048}$    | $100\theta_{\text{D}}$         | 0.16065  | $0.16068^{+0.00062}_{-0.00061}$ | $\chi_{\text{CamSpec}}^2$   | 7045.6   | $7059.8 (\nu: 14.2)$         |
| $\Omega_{\text{m}} h^3$              | 0.09641  | $0.09639^{+0.00099}_{-0.00098}$ | $z_{\text{eq}}$                | 3345     | $3351^{+120}_{-120}$            | $\chi_{\text{prior}}^2$     | 1.4      | $7.2 (\nu: 5.5)$             |
| $\sigma_8$                           | 0.7989   | $0.799^{+0.023}_{-0.024}$       | $k_{\text{eq}}$                | 0.010210 | $0.01023^{+0.00036}_{-0.00035}$ | $\chi_{\text{CMB}}^2$       | 7441.3   | $7456.6 (\nu: 15.5)$         |

Best-fit  $\chi_{\text{eff}}^2 = 7442.68$ ;  $\Delta\chi_{\text{eff}}^2 = -5.15$ ;  $\bar{\chi}_{\text{eff}}^2 = 7463.85$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -3.64$ ;  $R - 1 = 0.00741$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.67 ( $\Delta$  -0.16) CamSpec like\_10.7HM: 7045.62 ( $\Delta$  -4.09)



### 3.34 base\_Alens\_CamSpecHM\_TTTEEE

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|
| $\Omega_b h^2$                       | 0.022503 | $0.02247^{+0.00039}_{-0.00038}$ | $\Omega_m h^3$              | 0.09631  | $0.09626^{+0.00065}_{-0.00065}$ | $z_{\text{eq}}$             | 3361     | $3362^{+72}_{-71}$              |
| $\Omega_c h^2$                       | 0.11815  | $0.1182^{+0.0033}_{-0.0032}$    | $\sigma_8$                  | 0.843    | $0.850^{+0.091}_{-0.080}$       | $k_{\text{eq}}$             | 0.010259 | $0.01026^{+0.00022}_{-0.00022}$ |
| $100\theta_{\text{MC}}$              | 1.04105  | $1.04105^{+0.00065}_{-0.00065}$ | $S_8$                       | 0.849    | $0.857^{+0.097}_{-0.088}$       | $100\theta_{\text{eq}}$     | 0.8212   | $0.821^{+0.014}_{-0.014}$       |
| $\tau$                               | 0.101    | $< 0.208$                       | $\sigma_8 \Omega_m^{0.5}$   | 0.465    | $0.469^{+0.053}_{-0.048}$       | $100\theta_{\text{s,eq}}$   | 0.4534   | $0.4534^{+0.0072}_{-0.0071}$    |
| $A_L$                                | 1.035    | $1.02^{+0.24}_{-0.23}$          | $\sigma_8 \Omega_m^{0.25}$  | 0.626    | $0.632^{+0.069}_{-0.061}$       | $H(0.15)$                   | 73.37    | $73.3^{+1.3}_{-1.3}$            |
| $\ln(10^{10} A_s)$                   | 3.133    | $3.15^{+0.21}_{-0.19}$          | $\sigma_8/h^{0.5}$          | 1.021    | $1.03^{+0.11}_{-0.098}$         | $D_M(0.15)$                 | 636.6    | $637^{+13}_{-13}$               |
| $n_s$                                | 0.9716   | $0.971^{+0.012}_{-0.011}$       | $r_{\text{drag}} h$         | 100.49   | $100.5^{+2.6}_{-2.6}$           | $H(0.38)$                   | 83.35    | $83.33^{+0.97}_{-0.93}$         |
| $A_{100}^{\text{PS}}$                | 222.2    | $232^{+50}_{-50}$               | $\langle d^2 \rangle^{1/2}$ | 2.566    | $2.55^{+0.13}_{-0.13}$          | $D_M(0.38)$                 | 1519.9   | $1521^{+25}_{-25}$              |
| $A_{143}^{\text{PS}}$                | 48.5     | $35^{+20}_{-20}$                | $z_{\text{re}}$             | 11.9     | $12.0^{+8.2}_{-8.9}$            | $H(0.51)$                   | 90.00    | $89.97^{+0.77}_{-0.74}$         |
| $A_{217}^{\text{PS}}$                | 108.5    | $105^{+30}_{-30}$               | $10^9 A_s$                  | 2.294    | $2.34^{+0.51}_{-0.43}$          | $D_M(0.51)$                 | 1970.1   | $1971^{+30}_{-30}$              |
| $A_{217}^{\text{CIB}}$               | 38.8     | $37^{+10}_{-10}$                | $10^9 A_s e^{-2\tau}$       | 1.8725   | $1.871^{+0.025}_{-0.025}$       | $H(0.61)$                   | 95.56    | $95.54^{+0.63}_{-0.60}$         |
| $A_{143}^{\text{tSZ}}$               | 6.30     | $< 7.50$                        | $D_{40}$                    | 1234     | $1247^{+68}_{-53}$              | $D_M(0.61)$                 | 2293.4   | $2294^{+32}_{-32}$              |
| $r_{143 \times 217}^{\text{PS}}$     | 0.775    | $0.68^{+0.27}_{-0.25}$          | $D_{220}$                   | 5724     | $5720^{+79}_{-79}$              | $H(2.33)$                   | 235.49   | $235.5^{+1.9}_{-1.9}$           |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.84     | —                               | $D_{810}$                   | 2530.6   | $2529^{+28}_{-27}$              | $D_M(2.33)$                 | 5751.8   | $5753^{+27}_{-28}$              |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.996    | —                               | $D_{1420}$                  | 815.7    | $814.8^{+9.6}_{-9.7}$           | $f\sigma_8(0.15)$           | 0.470    | $0.475^{+0.053}_{-0.048}$       |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $D_{2000}$                  | 231.94   | $231.6^{+3.6}_{-3.6}$           | $\sigma_8(0.15)$            | 0.780    | $0.787^{+0.084}_{-0.073}$       |
| $A_{100}^{\text{dust}}$              | 1.003    | $0.998^{+0.38}_{-0.38}$         | $n_{\text{s},0.002}$        | 0.9716   | $0.971^{+0.012}_{-0.011}$       | $f\sigma_8(0.38)$           | 0.491    | $0.496^{+0.054}_{-0.048}$       |
| $A_{143}^{\text{dust}}$              | 0.960    | $0.94^{+0.35}_{-0.34}$          | $Y_{\text{P}}$              | 0.245446 | $0.24543^{+0.00015}_{-0.00015}$ | $\sigma_8(0.38)$            | 0.692    | $0.698^{+0.075}_{-0.065}$       |
| $A_{217}^{\text{dust}}$              | 0.987    | $0.98^{+0.20}_{-0.20}$          | $Y_{\text{P}}^{\text{BBN}}$ | 0.246772 | $0.24676^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | 0.491    | $0.495^{+0.054}_{-0.047}$       |
| $A_{143 \times 217}^{\text{dust}}$   | 1.001    | $1.02^{+0.32}_{-0.31}$          | $10^5 D/H$                  | 2.561    | $2.567^{+0.071}_{-0.069}$       | $\sigma_8(0.51)$            | 0.648    | $0.654^{+0.070}_{-0.061}$       |
| $y_{\text{cal}}$                     | 1.00001  | $1.0001^{+0.0050}_{-0.0049}$    | $\text{Age/Gyr}$            | 13.772   | $13.775^{+0.060}_{-0.062}$      | $f\sigma_8(0.61)$           | 0.4860   | $0.490^{+0.053}_{-0.047}$       |
| $c_{100}$                            | 0.99791  | $0.9976^{+0.0021}_{-0.0021}$    | $z_*$                       | 1089.59  | $1089.64^{+0.70}_{-0.69}$       | $\sigma_8(0.61)$            | 0.617    | $0.622^{+0.066}_{-0.058}$       |
| $c_{217}$                            | 1.00098  | $1.0009^{+0.0031}_{-0.0031}$    | $r_*$                       | 144.81   | $144.82^{+0.69}_{-0.69}$        | $f\sigma_8(2.33)$           | 0.3113   | $0.314^{+0.034}_{-0.029}$       |
| $c_{TE}$                             | 0.9919   | $0.992^{+0.011}_{-0.011}$       | $100\theta_*$               | 1.04123  | $1.04122^{+0.00063}_{-0.00064}$ | $\sigma_8(2.33)$            | 0.3213   | $0.324^{+0.035}_{-0.030}$       |
| $c_{EE}$                             | 0.9905   | $0.990^{+0.010}_{-0.0099}$      | $D_M(z_*)/\text{Gpc}$       | 13.908   | $13.909^{+0.063}_{-0.064}$      | $f_{2000}^{143}$            | 27.2     | $27^{+6}_{-6}$                  |
| $H_0$                                | 68.16    | $68.1^{+1.5}_{-1.5}$            | $z_{\text{drag}}$           | 1060.12  | $1060.04^{+0.77}_{-0.76}$       | $f_{2000}^{217}$            | 104.59   | $105.1^{+4.3}_{-4.4}$           |
| $\Omega_\Lambda$                     | 0.6959   | $0.695^{+0.019}_{-0.020}$       | $r_{\text{drag}}$           | 147.43   | $147.46^{+0.66}_{-0.66}$        | $f_{2000}^{143 \times 217}$ | 29.95    | $30^{+5}_{-5}$                  |
| $\Omega_m$                           | 0.3041   | $0.305^{+0.020}_{-0.019}$       | $k_{\text{D}}$              | 0.14061  | $0.14056^{+0.00069}_{-0.00069}$ | $\chi_{\text{CamSpec}}^2$   | 11495.7  | $11512.3 (\nu: 16.2)$           |
| $\Omega_m h^2$                       | 0.14130  | $0.1413^{+0.0030}_{-0.0030}$    | $100\theta_{\text{D}}$      | 0.160656 | $0.16070^{+0.00044}_{-0.00042}$ | $\chi_{\text{prior}}^2$     | 1.8      | $7.8 (\nu: 5.6)$                |

Best-fit  $\chi_{\text{eff}}^2 = 11497.50$ ;  $\Delta\chi_{\text{eff}}^2 = -0.14$ ;  $\bar{\chi}_{\text{eff}}^2 = 11520.05$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.29$ ;  $R - 1 = 0.00760$   
 $\chi_{\text{eff}}^2$ : CMB - CamSpec like\_10.7HM\_1400\_unified: 11495.71 ( $\Delta$  -0.08)



### 3.35 base\_Alens\_CamSpecHM\_TTTEEE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02247^{+0.00032}_{-0.00032}$ | $S_8$                       | $0.857^{+0.096}_{-0.085}$       | $H(0.15)$                   | $73.33^{+0.87}_{-0.86}$   |
| $\Omega_c h^2$                       | $0.1182^{+0.0022}_{-0.0022}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.469^{+0.052}_{-0.046}$       | $D_M(0.15)$                 | $636.9^{+8.5}_{-8.4}$     |
| $100\theta_{MC}$                     | $1.04105^{+0.00059}_{-0.00058}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.632^{+0.069}_{-0.060}$       | $H(0.38)$                   | $83.32^{+0.65}_{-0.64}$   |
| $\tau$                               | $< 0.207$                       | $\sigma_8/h^{0.5}$          | $1.03^{+0.11}_{-0.098}$         | $D_M(0.38)$                 | $1521^{+17}_{-17}$        |
| $A_L$                                | $1.02^{+0.24}_{-0.23}$          | $r_{\text{drag}} h$         | $100.4^{+1.7}_{-1.7}$           | $H(0.51)$                   | $89.97^{+0.53}_{-0.52}$   |
| $\ln(10^{10} A_s)$                   | $3.15^{+0.21}_{-0.19}$          | $\langle d^2 \rangle^{1/2}$ | $2.55^{+0.12}_{-0.13}$          | $D_M(0.51)$                 | $1971^{+20}_{-20}$        |
| $n_s$                                | $0.971^{+0.010}_{-0.0093}$      | $z_{\text{re}}$             | $12.0^{+8.2}_{-8.9}$            | $H(0.61)$                   | $95.54^{+0.45}_{-0.43}$   |
| $A_{100}^{\text{PS}}$                | $232^{+50}_{-50}$               | $10^9 A_s$                  | $2.34^{+0.51}_{-0.43}$          | $D_M(0.61)$                 | $2294^{+22}_{-22}$        |
| $A_{143}^{\text{PS}}$                | $35^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.022}_{-0.023}$       | $H(2.33)$                   | $235.5^{+1.3}_{-1.3}$     |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $D_{40}$                    | $1247^{+68}_{-52}$              | $D_M(2.33)$                 | $5753^{+20}_{-21}$        |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{220}$                   | $5721^{+79}_{-79}$              | $f\sigma_8(0.15)$           | $0.475^{+0.053}_{-0.047}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $D_{810}$                   | $2529^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.786^{+0.084}_{-0.073}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.27}_{-0.25}$          | $D_{1420}$                  | $814.8^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.495^{+0.054}_{-0.047}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $D_{2000}$                  | $231.5^{+3.4}_{-3.5}$           | $\sigma_8(0.38)$            | $0.698^{+0.075}_{-0.065}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $n_{s,0.002}$               | $0.971^{+0.010}_{-0.0093}$      | $f\sigma_8(0.51)$           | $0.495^{+0.054}_{-0.047}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P$                       | $0.24543^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.653^{+0.070}_{-0.061}$ |
| $A_{100}^{\text{dust}}$              | $0.998^{+0.38}_{-0.38}$         | $Y_P^{\text{BBN}}$          | $0.24676^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.490^{+0.053}_{-0.046}$ |
| $A_{143}^{\text{dust}}$              | $0.94^{+0.34}_{-0.35}$          | $10^5 D/H$                  | $2.568^{+0.060}_{-0.058}$       | $\sigma_8(0.61)$            | $0.622^{+0.067}_{-0.058}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $\text{Age/Gyr}$            | $13.776^{+0.046}_{-0.047}$      | $f\sigma_8(2.33)$           | $0.314^{+0.034}_{-0.029}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.31}_{-0.31}$          | $z_*$                       | $1089.64^{+0.52}_{-0.52}$       | $\sigma_8(2.33)$            | $0.324^{+0.035}_{-0.030}$ |
| $y_{\text{cal}}$                     | $1.0001^{+0.0050}_{-0.0049}$    | $r_*$                       | $144.82^{+0.50}_{-0.50}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04122^{+0.00058}_{-0.00057}$ | $f_{2000}^{217}$            | $105.1^{+4.2}_{-4.2}$     |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.909^{+0.048}_{-0.047}$      | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$            |
| $c_{TE}$                             | $0.992^{+0.011}_{-0.011}$       | $z_{\text{drag}}$           | $1060.04^{+0.69}_{-0.68}$       | $\chi_{\text{CamSpec}}^2$   | $11511.8 (\nu: 15.5)$     |
| $c_{EE}$                             | $0.990^{+0.010}_{-0.0099}$      | $r_{\text{drag}}$           | $147.46^{+0.52}_{-0.51}$        | $\chi_{6\text{DF}}^2$       | $0.032 (\nu: 0.0)$        |
| $H_0$                                | $68.1^{+1.0}_{-1.0}$            | $k_D$                       | $0.14056^{+0.00064}_{-0.00063}$ | $\chi_{\text{MGS}}^2$       | $1.74 (\nu: 0.1)$         |
| $\Omega_\Lambda$                     | $0.695^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16070^{+0.00041}_{-0.00040}$ | $\chi_{\text{DR12BAO}}^2$   | $4.02 (\nu: 0.4)$         |
| $\Omega_m$                           | $0.305^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3362^{+49}_{-48}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.7)$          |
| $\Omega_m h^2$                       | $0.1413^{+0.0020}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01026^{+0.00015}_{-0.00015}$ | $\chi_{\text{BAO}}^2$       | $5.79 (\nu: 0.3)$         |
| $\Omega_m h^3$                       | $0.09626^{+0.00064}_{-0.00064}$ | $100\theta_{\text{eq}}$     | $0.8210^{+0.0094}_{-0.0093}$    |                             |                           |
| $\sigma_8$                           | $0.850^{+0.091}_{-0.080}$       | $100\theta_{s,\text{eq}}$   | $0.4533^{+0.0048}_{-0.0048}$    |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11525.37; R - 1 = 0.00886$$



### 3.36 base\_Alens\_CamSpecHM\_TTTEEE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                      |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------------|
| $\Omega_b h^2$                       | $0.02248^{+0.00039}_{-0.00038}$ | $\Omega_m h^3$              | $0.09626^{+0.00064}_{-0.00065}$ | $z_{\text{eq}}$             | $3360^{+72}_{-71}$              |
| $\Omega_c h^2$                       | $0.1181^{+0.0033}_{-0.0032}$    | $\sigma_8$                  | $0.864^{+0.079}_{-0.069}$       | $k_{\text{eq}}$             | $0.01025^{+0.00022}_{-0.00022}$ |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00065}_{-0.00066}$ | $S_8$                       | $0.870^{+0.086}_{-0.079}$       | $100\theta_{\text{eq}}$     | $0.821^{+0.014}_{-0.014}$       |
| $\tau$                               | $0.126^{+0.088}_{-0.080}$       | $\sigma_8 \Omega_m^{0.5}$   | $0.477^{+0.047}_{-0.043}$       | $100\theta_{\text{s,eq}}$   | $0.4535^{+0.0072}_{-0.0071}$    |
| $A_L$                                | $0.98^{+0.21}_{-0.19}$          | $\sigma_8 \Omega_m^{0.25}$  | $0.642^{+0.060}_{-0.054}$       | $H(0.15)$                   | $73.4^{+1.3}_{-1.3}$            |
| $\ln(10^{10} A_s)$                   | $3.18^{+0.18}_{-0.16}$          | $\sigma_8/h^{0.5}$          | $1.047^{+0.097}_{-0.086}$       | $D_M(0.15)$                 | $637^{+13}_{-13}$               |
| $n_s$                                | $0.972^{+0.012}_{-0.012}$       | $r_{\text{drag}} h$         | $100.5^{+2.6}_{-2.6}$           | $H(0.38)$                   | $83.35^{+0.97}_{-0.93}$         |
| $A_{100}^{\text{PS}}$                | $231^{+50}_{-50}$               | $\langle d^2 \rangle^{1/2}$ | $2.56^{+0.13}_{-0.13}$          | $D_M(0.38)$                 | $1520^{+25}_{-25}$              |
| $A_{143}^{\text{PS}}$                | $35^{+20}_{-20}$                | $z_{\text{re}}$             | $< 19.8$                        | $H(0.51)$                   | $89.99^{+0.78}_{-0.74}$         |
| $A_{217}^{\text{PS}}$                | $105^{+30}_{-30}$               | $10^9 A_s$                  | $2.42^{+0.44}_{-0.37}$          | $D_M(0.51)$                 | $1970^{+30}_{-30}$              |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.025}_{-0.025}$       | $H(0.61)$                   | $95.55^{+0.63}_{-0.60}$         |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{40}$                    | $1253^{+64}_{-53}$              | $D_M(0.61)$                 | $2294^{+32}_{-32}$              |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.27}_{-0.25}$          | $D_{220}$                   | $5718^{+79}_{-80}$              | $H(2.33)$                   | $235.4^{+1.9}_{-1.9}$           |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $D_{810}$                   | $2528^{+28}_{-27}$              | $D_M(2.33)$                 | $5753^{+27}_{-28}$              |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $D_{1420}$                  | $814.9^{+9.6}_{-9.7}$           | $f\sigma_8(0.15)$           | $0.482^{+0.048}_{-0.042}$       |
| $A^{\text{kSZ}}$                     | —                               | $D_{2000}$                  | $231.7^{+3.6}_{-3.6}$           | $\sigma_8(0.15)$            | $0.799^{+0.073}_{-0.063}$       |
| $A_{100}^{\text{dust}}$              | $0.995^{+0.38}_{-0.38}$         | $n_{\text{s},0.002}$        | $0.972^{+0.012}_{-0.012}$       | $f\sigma_8(0.38)$           | $0.503^{+0.048}_{-0.042}$       |
| $A_{143}^{\text{dust}}$              | $0.94^{+0.34}_{-0.34}$          | $Y_{\text{P}}$              | $0.24543^{+0.00015}_{-0.00015}$ | $\sigma_8(0.38)$            | $0.709^{+0.064}_{-0.056}$       |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24676^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | $0.503^{+0.047}_{-0.041}$       |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.32}_{-0.31}$          | $10^5 \text{D/H}$           | $2.566^{+0.071}_{-0.069}$       | $\sigma_8(0.51)$            | $0.664^{+0.060}_{-0.052}$       |
| $y_{\text{cal}}$                     | $1.0001^{+0.0050}_{-0.0049}$    | $\text{Age/Gyr}$            | $13.774^{+0.060}_{-0.061}$      | $f\sigma_8(0.61)$           | $0.498^{+0.046}_{-0.041}$       |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $z_*$                       | $1089.62^{+0.70}_{-0.69}$       | $\sigma_8(0.61)$            | $0.632^{+0.057}_{-0.050}$       |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0031}$    | $r_*$                       | $144.84^{+0.69}_{-0.68}$        | $f\sigma_8(2.33)$           | $0.319^{+0.029}_{-0.025}$       |
| $c_{TE}$                             | $0.992^{+0.011}_{-0.011}$       | $100\theta_*$               | $1.04123^{+0.00063}_{-0.00064}$ | $\sigma_8(2.33)$            | $0.329^{+0.030}_{-0.026}$       |
| $c_{EE}$                             | $0.990^{+0.010}_{-0.0098}$      | $D_M(z_*)/\text{Gpc}$       | $13.910^{+0.063}_{-0.063}$      | $f_{2000}^{143}$            | $27^{+6}_{-6}$                  |
| $H_0$                                | $68.2^{+1.5}_{-1.5}$            | $z_{\text{drag}}$           | $1060.05^{+0.76}_{-0.77}$       | $f_{2000}^{217}$            | $104.9^{+4.3}_{-4.4}$           |
| $\Omega_\Lambda$                     | $0.696^{+0.019}_{-0.020}$       | $r_{\text{drag}}$           | $147.47^{+0.66}_{-0.66}$        | $f_{2000}^{143 \times 217}$ | $30^{+5}_{-5}$                  |
| $\Omega_m$                           | $0.304^{+0.020}_{-0.019}$       | $k_{\text{D}}$              | $0.14055^{+0.00069}_{-0.00069}$ | $\chi_{\text{CamSpec}}^2$   | $11512.2 (\nu: 16.3)$           |
| $\Omega_m h^2$                       | $0.1412^{+0.0030}_{-0.0030}$    | $100\theta_{\text{D}}$      | $0.16069^{+0.00044}_{-0.00042}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.6)$                |

$$\bar{\chi}_{\text{eff}}^2 = 11520.01; R - 1 = 0.00786$$



### 3.37 base\_Alens\_CamSpecHM\_TTTEEE\_post\_BAO\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02247^{+0.00032}_{-0.00032}$ | $S_8$                                 | $0.870^{+0.084}_{-0.075}$       | $H(0.15)$                   | $73.34^{+0.87}_{-0.86}$   |
| $\Omega_{\mathrm{c}} h^2$                | $0.1182^{+0.0022}_{-0.0022}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.477^{+0.046}_{-0.041}$       | $D_{\mathrm{M}}(0.15)$      | $636.8^{+8.5}_{-8.4}$     |
| $100\theta_{\mathrm{MC}}$                | $1.04105^{+0.00059}_{-0.00059}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.642^{+0.060}_{-0.052}$       | $H(0.38)$                   | $83.33^{+0.65}_{-0.64}$   |
| $\tau$                                   | $0.125^{+0.088}_{-0.080}$       | $\sigma_8/h^{0.5}$                    | $1.047^{+0.097}_{-0.085}$       | $D_{\mathrm{M}}(0.38)$      | $1520^{+17}_{-17}$        |
| $A_{\mathrm{L}}$                         | $0.98^{+0.21}_{-0.20}$          | $r_{\mathrm{drag}} h$                 | $100.5^{+1.7}_{-1.7}$           | $H(0.51)$                   | $89.98^{+0.53}_{-0.52}$   |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.18^{+0.18}_{-0.16}$          | $\langle d^2 \rangle^{1/2}$           | $2.55^{+0.12}_{-0.13}$          | $D_{\mathrm{M}}(0.51)$      | $1971^{+20}_{-20}$        |
| $n_{\mathrm{s}}$                         | $0.972^{+0.010}_{-0.0093}$      | $z_{\mathrm{re}}$                     | $< 19.7$                        | $H(0.61)$                   | $95.54^{+0.44}_{-0.43}$   |
| $A_{100}^{\mathrm{PS}}$                  | $232^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | $2.41^{+0.44}_{-0.37}$          | $D_{\mathrm{M}}(0.61)$      | $2294^{+22}_{-22}$        |
| $A_{143}^{\mathrm{PS}}$                  | $35^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.870^{+0.022}_{-0.022}$       | $H(2.33)$                   | $235.5^{+1.3}_{-1.3}$     |
| $A_{217}^{\mathrm{PS}}$                  | $105^{+30}_{-30}$               | $D_{40}$                              | $1253^{+65}_{-52}$              | $D_{\mathrm{M}}(2.33)$      | $5753^{+20}_{-21}$        |
| $A_{217}^{\mathrm{CIB}}$                 | $37^{+10}_{-10}$                | $D_{220}$                             | $5719^{+77}_{-79}$              | $f\sigma_8(0.15)$           | $0.482^{+0.046}_{-0.041}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.56$                        | $D_{810}$                             | $2528^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.799^{+0.073}_{-0.063}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.68^{+0.27}_{-0.25}$          | $D_{1420}$                            | $814.9^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.503^{+0.047}_{-0.041}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $D_{2000}$                            | $231.6^{+3.4}_{-3.4}$           | $\sigma_8(0.38)$            | $0.709^{+0.065}_{-0.056}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $n_{\mathrm{s},0.002}$                | $0.972^{+0.010}_{-0.0093}$      | $f\sigma_8(0.51)$           | $0.503^{+0.047}_{-0.041}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}$                      | $0.24543^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.664^{+0.061}_{-0.052}$ |
| $A_{100}^{\mathrm{dust}}$                | $0.995^{+0.39}_{-0.38}$         | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24676^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.498^{+0.046}_{-0.040}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.94^{+0.34}_{-0.35}$          | $10^5 \mathrm{D}/\mathrm{H}$          | $2.567^{+0.061}_{-0.058}$       | $\sigma_8(0.61)$            | $0.632^{+0.058}_{-0.050}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.775^{+0.046}_{-0.046}$      | $f\sigma_8(2.33)$           | $0.319^{+0.029}_{-0.025}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.01^{+0.31}_{-0.31}$          | $z_*$                                 | $1089.63^{+0.52}_{-0.52}$       | $\sigma_8(2.33)$            | $0.329^{+0.030}_{-0.026}$ |
| $y_{\mathrm{cal}}$                       | $1.0001^{+0.0050}_{-0.0049}$    | $r_*$                                 | $144.83^{+0.50}_{-0.50}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                         | $1.04123^{+0.00058}_{-0.00058}$ | $f_{2000}^{217}$            | $105.0^{+4.1}_{-4.2}$     |
| $c_{217}$                                | $1.0009^{+0.0031}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.909^{+0.048}_{-0.047}$      | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$            |
| $c_{TE}$                                 | $0.992^{+0.011}_{-0.011}$       | $z_{\mathrm{drag}}$                   | $1060.04^{+0.69}_{-0.68}$       | $\chi_{\mathrm{CamSpec}}^2$ | $11511.7 (\nu: 15.7)$     |
| $c_{EE}$                                 | $0.990^{+0.010}_{-0.0098}$      | $r_{\mathrm{drag}}$                   | $147.46^{+0.52}_{-0.51}$        | $\chi_{6\mathrm{DF}}^2$     | $0.032 (\nu: 0.0)$        |
| $H_0$                                    | $68.1^{+1.0}_{-1.0}$            | $k_{\mathrm{D}}$                      | $0.14055^{+0.00063}_{-0.00063}$ | $\chi_{\mathrm{MGS}}^2$     | $1.75 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                       | $0.696^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{D}}$              | $0.16070^{+0.00041}_{-0.00039}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.00 (\nu: 0.4)$         |
| $\Omega_{\mathrm{m}}$                    | $0.304^{+0.013}_{-0.013}$       | $z_{\mathrm{eq}}$                     | $3361^{+49}_{-48}$              | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.7)$          |
| $\Omega_{\mathrm{m}} h^2$                | $0.1413^{+0.0021}_{-0.0020}$    | $k_{\mathrm{eq}}$                     | $0.01026^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{BAO}}^2$     | $5.79 (\nu: 0.3)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.09626^{+0.00063}_{-0.00065}$ | $100\theta_{\mathrm{eq}}$             | $0.8212^{+0.0094}_{-0.0093}$    |                             |                           |
| $\sigma_8$                               | $0.864^{+0.079}_{-0.068}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$  | $0.4534^{+0.0048}_{-0.0048}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11525.31; R - 1 = 0.00906$$



### 3.38 base\_Alens\_CamSpecHM\_TTTEEE\_lowl

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022524 | $0.02251^{+0.00037}_{-0.00037}$ | $\sigma_8$                     | 0.7686   | $0.805^{+0.054}_{-0.043}$       | $100\theta_{\text{eq}}$     | 0.8220   | $0.823^{+0.014}_{-0.013}$    |
| $\Omega_c h^2$                       | 0.11795  | $0.1179^{+0.0032}_{-0.0031}$    | $S_8$                          | 0.772    | $0.808^{+0.063}_{-0.056}$       | $100\theta_{\text{s,eq}}$   | 0.4538   | $0.4541^{+0.0069}_{-0.0069}$ |
| $100\theta_{\text{MC}}$              | 1.04108  | $1.04108^{+0.00065}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.4230   | $0.443^{+0.034}_{-0.031}$       | $H(0.15)$                   | 73.45    | $73.5^{+1.3}_{-1.2}$         |
| $\tau$                               | 0.010    | $< 0.119$                       | $\sigma_8 \Omega_m^{0.25}$     | 0.5702   | $0.597^{+0.042}_{-0.036}$       | $D_{\text{M}}(0.15)$        | 635.7    | $636^{+12}_{-12}$            |
| $A_{\text{L}}$                       | 1.248    | $1.14^{+0.18}_{-0.19}$          | $\sigma_8/h^{0.5}$             | 0.930    | $0.974^{+0.068}_{-0.057}$       | $H(0.38)$                   | 83.42    | $83.43^{+0.94}_{-0.92}$      |
| $\ln(10^{10} A_{\text{s}})$          | 2.950    | $3.04^{+0.13}_{-0.099}$         | $r_{\text{drag}} h$            | 100.66   | $100.7^{+2.5}_{-2.5}$           | $D_{\text{M}}(0.38)$        | 1518.2   | $1518^{+25}_{-25}$           |
| $n_{\text{s}}$                       | 0.9717   | $0.972^{+0.011}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$    | 2.568    | $2.56^{+0.13}_{-0.13}$          | $H(0.51)$                   | 90.05    | $90.06^{+0.76}_{-0.73}$      |
| $y_{\text{cal}}$                     | 0.99998  | $1.0001^{+0.0049}_{-0.0050}$    | $z_{\text{re}}$                | 2.1      | $7.5^{+6.0}_{-5.4}$             | $D_{\text{M}}(0.51)$        | 1968.1   | $1968^{+29}_{-29}$           |
| $A_{100}^{\text{PS}}$                | 222.3    | $232^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | 1.910    | $2.10^{+0.28}_{-0.21}$          | $H(0.61)$                   | 95.60    | $95.61^{+0.62}_{-0.59}$      |
| $A_{143}^{\text{PS}}$                | 48.5     | $35^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8720   | $1.870^{+0.024}_{-0.024}$       | $D_{\text{M}}(0.61)$        | 2291.3   | $2291^{+31}_{-31}$           |
| $A_{217}^{\text{PS}}$                | 108.5    | $105^{+20}_{-30}$               | $D_{40}$                       | 1206.1   | $1217^{+34}_{-32}$              | $H(2.33)$                   | 235.38   | $235.3^{+1.8}_{-1.8}$        |
| $A_{217}^{\text{CIB}}$               | 38.7     | $37^{+10}_{-10}$                | $D_{220}$                      | 5725     | $5722^{+74}_{-78}$              | $D_{\text{M}}(2.33)$        | 5750.1   | $5750^{+26}_{-27}$           |
| $A_{143}^{\text{tSZ}}$               | 6.30     | $4.1^{+3.6}_{-4.0}$             | $D_{810}$                      | 2530.4   | $2528^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4280   | $0.448^{+0.034}_{-0.030}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.779    | $0.68^{+0.25}_{-0.26}$          | $D_{1420}$                     | 815.6    | $814.8^{+9.3}_{-9.4}$           | $\sigma_8(0.15)$            | 0.7111   | $0.744^{+0.050}_{-0.039}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.83     | —                               | $D_{2000}$                     | 231.89   | $231.6^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | 0.4472   | $0.468^{+0.034}_{-0.029}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.998    | —                               | $n_{\text{s},0.002}$           | 0.9717   | $0.972^{+0.011}_{-0.010}$       | $\sigma_8(0.38)$            | 0.6312   | $0.661^{+0.044}_{-0.034}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}$                 | 0.245453 | $0.24545^{+0.00015}_{-0.00014}$ | $f\sigma_8(0.51)$           | 0.4469   | $0.468^{+0.033}_{-0.028}$    |
| $A_{100}^{\text{dust}}$              | 1.010    | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246780 | $0.24677^{+0.00015}_{-0.00015}$ | $\sigma_8(0.51)$            | 0.5911   | $0.619^{+0.041}_{-0.032}$    |
| $A_{143}^{\text{dust}}$              | 0.971    | $0.95^{+0.34}_{-0.34}$          | $10^5 D/\text{H}$              | 2.558    | $2.561^{+0.068}_{-0.067}$       | $f\sigma_8(0.61)$           | 0.4428   | $0.463^{+0.032}_{-0.027}$    |
| $A_{217}^{\text{dust}}$              | 0.993    | $0.98^{+0.20}_{-0.20}$          | Age/Gyr                        | 13.768   | $13.769^{+0.059}_{-0.060}$      | $\sigma_8(0.61)$            | 0.5627   | $0.589^{+0.039}_{-0.030}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.016    | $1.01^{+0.32}_{-0.31}$          | $z_*$                          | 1089.55  | $1089.56^{+0.67}_{-0.65}$       | $f\sigma_8(2.33)$           | 0.2840   | $0.297^{+0.020}_{-0.015}$    |
| $c_{100}$                            | 0.99788  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                          | 144.85   | $144.88^{+0.67}_{-0.67}$        | $\sigma_8(2.33)$            | 0.2932   | $0.307^{+0.021}_{-0.015}$    |
| $c_{217}$                            | 1.00107  | $1.0009^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | 1.04125  | $1.04125^{+0.00063}_{-0.00064}$ | $f_{2000}^{143}$            | 27.2     | $27^{+6}_{-6}$               |
| $c_{\text{TE}}$                      | 0.9922   | $0.992^{+0.011}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.911   | $13.914^{+0.061}_{-0.062}$      | $f_{2000}^{217}$            | 104.66   | $105.0^{+4.1}_{-4.2}$        |
| $c_{\text{EE}}$                      | 0.9904   | $0.9903^{+0.0098}_{-0.0098}$    | $z_{\text{drag}}$              | 1060.16  | $1060.10^{+0.74}_{-0.70}$       | $f_{2000}^{143 \times 217}$ | 30.03    | $30^{+4}_{-4}$               |
| $H_0$                                | 68.26    | $68.3^{+1.5}_{-1.5}$            | $r_{\text{drag}}$              | 147.46   | $147.51^{+0.65}_{-0.65}$        | $\chi_{\text{lowl}}^2$      | 21.34    | $22.5 (\nu: 1.0)$            |
| $\Omega_{\Lambda}$                   | 0.6971   | $0.697^{+0.018}_{-0.019}$       | $k_{\text{D}}$                 | 0.14059  | $0.14053^{+0.00070}_{-0.00069}$ | $\chi_{\text{CamSpec}}^2$   | 11496.5  | $11512.4 (\nu: 16.3)$        |
| $\Omega_{\text{m}}$                  | 0.3029   | $0.303^{+0.019}_{-0.018}$       | $100\theta_{\text{D}}$         | 0.160639 | $0.16066^{+0.00042}_{-0.00041}$ | $\chi_{\text{prior}}^2$     | 1.9      | $7.7 (\nu: 5.5)$             |
| $\Omega_{\text{m}} h^2$              | 0.14112  | $0.1410^{+0.0029}_{-0.0029}$    | $z_{\text{eq}}$                | 3357     | $3354^{+70}_{-68}$              | $\chi_{\text{CMB}}^2$       | 11517.8  | $11534.9 (\nu: 16.8)$        |
| $\Omega_{\text{m}} h^3$              | 0.09633  | $0.09628^{+0.00065}_{-0.00065}$ | $k_{\text{eq}}$                | 0.010245 | $0.01024^{+0.00021}_{-0.00021}$ |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11519.71$ ;  $\Delta\chi_{\text{eff}}^2 = -2.34$ ;  $\bar{\chi}_{\text{eff}}^2 = 11542.67$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -1.43$ ;  $R - 1 = 0.01017$

$\chi_{\text{eff}}^2$ : CMB - commander\_dx12\_v3\_2\_29: 21.34 ( $\Delta$  -2.58) CamSpec like\_10.7HM.1400\_unified: 11496.50 ( $\Delta$  0.28)



### 3.39 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02249^{+0.00033}_{-0.00031}$ | $S_8$                       | $0.809^{+0.058}_{-0.050}$       | $H(0.15)$                   | $73.40^{+0.86}_{-0.84}$   |
| $\Omega_c h^2$                       | $0.1180^{+0.0022}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.032}_{-0.027}$       | $D_M(0.15)$                 | $636.3^{+8.3}_{-8.3}$     |
| $100\theta_{MC}$                     | $1.04106^{+0.00059}_{-0.00060}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.597^{+0.041}_{-0.034}$       | $H(0.38)$                   | $83.37^{+0.65}_{-0.63}$   |
| $\tau$                               | $< 0.115$                       | $\sigma_8/h^{0.5}$          | $0.974^{+0.065}_{-0.053}$       | $D_M(0.38)$                 | $1519^{+17}_{-17}$        |
| $A_L$                                | $1.13^{+0.17}_{-0.19}$          | $r_{\text{drag}} h$         | $100.6^{+1.7}_{-1.7}$           | $H(0.51)$                   | $90.01^{+0.53}_{-0.51}$   |
| $\ln(10^{10} A_s)$                   | $3.04^{+0.12}_{-0.097}$         | $\langle d^2 \rangle^{1/2}$ | $2.56^{+0.12}_{-0.13}$          | $D_M(0.51)$                 | $1969^{+20}_{-20}$        |
| $n_s$                                | $0.9711^{+0.0086}_{-0.0082}$    | $z_{\text{re}}$             | $7.4^{+5.9}_{-5.3}$             | $H(0.61)$                   | $95.57^{+0.45}_{-0.42}$   |
| $y_{\text{cal}}$                     | $1.0000^{+0.0049}_{-0.0050}$    | $10^9 A_s$                  | $2.09^{+0.27}_{-0.20}$          | $D_M(0.61)$                 | $2293^{+21}_{-22}$        |
| $A_{100}^{\text{PS}}$                | $232^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.022}_{-0.022}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$     |
| $A_{143}^{\text{PS}}$                | $35^{+20}_{-20}$                | $D_{40}$                    | $1218^{+32}_{-30}$              | $D_M(2.33)$                 | $5752^{+20}_{-21}$        |
| $A_{217}^{\text{PS}}$                | $105^{+20}_{-30}$               | $D_{220}$                   | $5721^{+75}_{-78}$              | $f\sigma_8(0.15)$           | $0.448^{+0.032}_{-0.027}$ |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{810}$                   | $2528^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.744^{+0.048}_{-0.037}$ |
| $A_{143}^{\text{tSZ}}$               | $4.1^{+3.6}_{-4.0}$             | $D_{1420}$                  | $814.7^{+9.3}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.468^{+0.032}_{-0.027}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.5^{+3.3}_{-3.3}$           | $\sigma_8(0.38)$            | $0.660^{+0.042}_{-0.033}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9711^{+0.0086}_{-0.0082}$    | $f\sigma_8(0.51)$           | $0.468^{+0.031}_{-0.026}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24544^{+0.00013}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.618^{+0.040}_{-0.030}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24677^{+0.00013}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.464^{+0.031}_{-0.025}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.37}$          | $10^5 D/H$                  | $2.564^{+0.058}_{-0.059}$       | $\sigma_8(0.61)$            | $0.589^{+0.038}_{-0.029}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.35}$          | Age/Gyr                     | $13.773^{+0.046}_{-0.047}$      | $f\sigma_8(2.33)$           | $0.297^{+0.019}_{-0.015}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.60^{+0.51}_{-0.51}$       | $\sigma_8(2.33)$            | $0.307^{+0.020}_{-0.015}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.31}$          | $r_*$                       | $144.85^{+0.49}_{-0.49}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04123^{+0.00057}_{-0.00059}$ | $f_{2000}^{217}$            | $105.1^{+4.1}_{-4.0}$     |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.911^{+0.047}_{-0.047}$      | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$            |
| $c_{TE}$                             | $0.993^{+0.011}_{-0.010}$       | $z_{\text{drag}}$           | $1060.08^{+0.70}_{-0.68}$       | $\chi_{\text{lowl}}^2$      | $22.5 (\nu: 0.9)$         |
| $c_{EE}$                             | $0.9903^{+0.0097}_{-0.0098}$    | $r_{\text{drag}}$           | $147.48^{+0.51}_{-0.51}$        | $\chi_{\text{CamSpec}}^2$   | $11511.8 (\nu: 15.1)$     |
| $H_0$                                | $68.20^{+0.99}_{-0.98}$         | $k_D$                       | $0.14055^{+0.00063}_{-0.00063}$ | $\chi_{6\text{DF}}^2$       | $0.031 (\nu: 0.0)$        |
| $\Omega_\Lambda$                     | $0.696^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16068^{+0.00039}_{-0.00039}$ | $\chi_{\text{MGS}}^2$       | $1.82 (\nu: 0.1)$         |
| $\Omega_m$                           | $0.304^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3358^{+49}_{-47}$              | $\chi_{\text{DR12BAO}}^2$   | $3.94 (\nu: 0.3)$         |
| $\Omega_m h^2$                       | $0.1412^{+0.0020}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01025^{+0.00015}_{-0.00014}$ | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.5)$          |
| $\Omega_m h^3$                       | $0.09627^{+0.00065}_{-0.00065}$ | $100\theta_{\text{eq}}$     | $0.8217^{+0.0092}_{-0.0092}$    | $\chi_{\text{BAO}}^2$       | $5.78 (\nu: 0.3)$         |
| $\sigma_8$                           | $0.804^{+0.052}_{-0.041}$       | $100\theta_{s,\text{eq}}$   | $0.4537^{+0.0047}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11534.3 (\nu: 15.7)$     |

$$\bar{\chi}_{\text{eff}}^2 = 11547.85; \Delta\bar{\chi}_{\text{eff}}^2 = -1.38; R - 1 = 0.01201$$



### 3.40 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02252^{+0.00038}_{-0.00036}$ | $\sigma_8$                          | $0.823^{+0.046}_{-0.036}$       | $100\theta_{\text{eq}}$     | $0.823^{+0.014}_{-0.014}$    |
| $\Omega_c h^2$                       | $0.1177^{+0.0032}_{-0.0031}$    | $S_8$                               | $0.825^{+0.055}_{-0.051}$       | $100\theta_{\text{s,eq}}$   | $0.4544^{+0.0070}_{-0.0070}$ |
| $100\theta_{\text{MC}}$              | $1.04110^{+0.00065}_{-0.00065}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.452^{+0.030}_{-0.028}$       | $H(0.15)$                   | $73.5^{+1.3}_{-1.3}$         |
| $\tau$                               | $0.079^{+0.054}_{-0.037}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.610^{+0.036}_{-0.032}$       | $D_{\text{M}}(0.15)$        | $635^{+12}_{-12}$            |
| $A_{\text{L}}$                       | $1.09^{+0.16}_{-0.16}$          | $\sigma_8/h^{0.5}$                  | $0.995^{+0.058}_{-0.049}$       | $H(0.38)$                   | $83.47^{+0.95}_{-0.92}$      |
| $\ln(10^{10} A_{\text{s}})$          | $3.09^{+0.11}_{-0.079}$         | $r_{\text{drag}} h$                 | $100.8^{+2.5}_{-2.5}$           | $D_{\text{M}}(0.38)$        | $1517^{+25}_{-25}$           |
| $n_{\text{s}}$                       | $0.972^{+0.011}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$         | $2.56^{+0.13}_{-0.13}$          | $H(0.51)$                   | $90.09^{+0.77}_{-0.74}$      |
| $y_{\text{cal}}$                     | $1.0001^{+0.0049}_{-0.0050}$    | $z_{\text{re}}$                     | $< 14.3$                        | $D_{\text{M}}(0.51)$        | $1967^{+29}_{-29}$           |
| $A_{100}^{\text{PS}}$                | $231^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | $2.19^{+0.24}_{-0.17}$          | $H(0.61)$                   | $95.63^{+0.63}_{-0.59}$      |
| $A_{143}^{\text{PS}}$                | $35^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.869^{+0.025}_{-0.024}$       | $D_{\text{M}}(0.61)$        | $2290^{+31}_{-32}$           |
| $A_{217}^{\text{PS}}$                | $105^{+20}_{-30}$               | $D_{40}$                            | $1222^{+34}_{-32}$              | $H(2.33)$                   | $235.2^{+1.9}_{-1.8}$        |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{220}$                           | $5720^{+73}_{-77}$              | $D_{\text{M}}(2.33)$        | $5749^{+27}_{-27}$           |
| $A_{143}^{\text{tSZ}}$               | $4.1^{+3.6}_{-4.0}$             | $D_{810}$                           | $2528^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.457^{+0.030}_{-0.027}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.25}_{-0.26}$          | $D_{1420}$                          | $815.1^{+9.7}_{-9.3}$           | $\sigma_8(0.15)$            | $0.761^{+0.043}_{-0.032}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $D_{2000}$                          | $231.8^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | $0.478^{+0.029}_{-0.025}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $n_{\text{s},0.002}$                | $0.972^{+0.011}_{-0.010}$       | $\sigma_8(0.38)$            | $0.676^{+0.038}_{-0.028}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}$                      | $0.24545^{+0.00015}_{-0.00014}$ | $f\sigma_8(0.51)$           | $0.478^{+0.028}_{-0.024}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$         | $0.24678^{+0.00015}_{-0.00014}$ | $\sigma_8(0.51)$            | $0.633^{+0.035}_{-0.026}$    |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.34}$          | $10^5 \text{D}/\text{H}$            | $2.559^{+0.068}_{-0.067}$       | $f\sigma_8(0.61)$           | $0.474^{+0.027}_{-0.023}$    |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$             | $13.767^{+0.059}_{-0.060}$      | $\sigma_8(0.61)$            | $0.603^{+0.034}_{-0.025}$    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $z_*$                               | $1089.54^{+0.68}_{-0.65}$       | $f\sigma_8(2.33)$           | $0.304^{+0.017}_{-0.012}$    |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $r_*$                               | $144.91^{+0.68}_{-0.68}$        | $\sigma_8(2.33)$            | $0.314^{+0.018}_{-0.013}$    |
| $c_{217}$                            | $1.0008^{+0.0031}_{-0.0031}$    | $100\theta_*$                       | $1.04127^{+0.00063}_{-0.00064}$ | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $c_{TE}$                             | $0.992^{+0.011}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.916^{+0.062}_{-0.063}$      | $f_{2000}^{217}$            | $104.8^{+4.1}_{-4.1}$        |
| $c_{EE}$                             | $0.9901^{+0.0096}_{-0.0096}$    | $z_{\text{drag}}$                   | $1060.12^{+0.73}_{-0.72}$       | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $H_0$                                | $68.3^{+1.5}_{-1.5}$            | $r_{\text{drag}}$                   | $147.53^{+0.66}_{-0.66}$        | $\chi_{\text{lowl}}^2$      | $23.1 (\nu: 1.2)$            |
| $\Omega_{\Lambda}$                   | $0.698^{+0.018}_{-0.019}$       | $k_{\text{D}}$                      | $0.14052^{+0.00071}_{-0.00070}$ | $\chi_{\text{CamSpec}}^2$   | $11512.4 (\nu: 16.5)$        |
| $\Omega_{\text{m}}$                  | $0.302^{+0.019}_{-0.018}$       | $100\theta_{\text{D}}$              | $0.16066^{+0.00042}_{-0.00041}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.6)$             |
| $\Omega_{\text{m}} h^2$              | $0.1409^{+0.0030}_{-0.0029}$    | $z_{\text{eq}}$                     | $3351^{+71}_{-69}$              | $\chi_{\text{CMB}}^2$       | $11535.5 (\nu: 17.2)$        |
| $\Omega_{\text{m}} h^3$              | $0.09628^{+0.00065}_{-0.00065}$ | $k_{\text{eq}}$                     | $0.01023^{+0.00022}_{-0.00021}$ |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11543.27; \Delta\bar{\chi}_{\text{eff}}^2 = -0.66; R - 1 = 0.01232$$



### 3.41 base\_Alens\_CamSpecHM\_TTTEEE\_lowl\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02250^{+0.00034}_{-0.00031}$ | $S_8$                       | $0.827^{+0.050}_{-0.044}$       | $H(0.15)$                   | $73.41^{+0.87}_{-0.85}$   |
| $\Omega_c h^2$                       | $0.1180^{+0.0022}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.027}_{-0.024}$       | $D_M(0.15)$                 | $636.1^{+8.4}_{-8.4}$     |
| $100\theta_{MC}$                     | $1.04106^{+0.00059}_{-0.00057}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.611^{+0.034}_{-0.028}$       | $H(0.38)$                   | $83.38^{+0.66}_{-0.64}$   |
| $\tau$                               | $0.078^{+0.050}_{-0.037}$       | $\sigma_8/h^{0.5}$          | $0.996^{+0.055}_{-0.045}$       | $D_M(0.38)$                 | $1519^{+17}_{-17}$        |
| $A_L$                                | $1.08^{+0.15}_{-0.16}$          | $r_{\text{drag}} h$         | $100.6^{+1.7}_{-1.7}$           | $H(0.51)$                   | $90.02^{+0.54}_{-0.52}$   |
| $\ln(10^{10} A_s)$                   | $3.08^{+0.10}_{-0.078}$         | $\langle d^2 \rangle^{1/2}$ | $2.56^{+0.13}_{-0.13}$          | $D_M(0.51)$                 | $1969^{+20}_{-20}$        |
| $n_s$                                | $0.9717^{+0.0086}_{-0.0083}$    | $z_{\text{re}}$             | $< 13.9$                        | $H(0.61)$                   | $95.58^{+0.46}_{-0.43}$   |
| $y_{\text{cal}}$                     | $1.0001^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.19^{+0.23}_{-0.17}$          | $D_M(0.61)$                 | $2292^{+22}_{-22}$        |
| $A_{100}^{\text{PS}}$                | $231^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.022}_{-0.021}$       | $H(2.33)$                   | $235.4^{+1.3}_{-1.3}$     |
| $A_{143}^{\text{PS}}$                | $35^{+20}_{-20}$                | $D_{40}$                    | $1223^{+32}_{-31}$              | $D_M(2.33)$                 | $5752^{+20}_{-22}$        |
| $A_{217}^{\text{PS}}$                | $105^{+20}_{-30}$               | $D_{220}$                   | $5719^{+72}_{-78}$              | $f\sigma_8(0.15)$           | $0.458^{+0.027}_{-0.024}$ |
| $A_{217}^{\text{CIB}}$               | $37^{+10}_{-10}$                | $D_{810}$                   | $2528^{+28}_{-26}$              | $\sigma_8(0.15)$            | $0.761^{+0.041}_{-0.031}$ |
| $A_{143}^{\text{tSZ}}$               | $4.1^{+3.7}_{-4.0}$             | $D_{1420}$                  | $814.9^{+9.7}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.479^{+0.027}_{-0.023}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.68^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.6^{+3.3}_{-3.2}$           | $\sigma_8(0.38)$            | $0.676^{+0.036}_{-0.027}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9717^{+0.0086}_{-0.0083}$    | $f\sigma_8(0.51)$           | $0.478^{+0.027}_{-0.022}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24544^{+0.00013}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.633^{+0.034}_{-0.025}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24677^{+0.00013}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.474^{+0.026}_{-0.021}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.40}_{-0.37}$          | $10^5 \text{D/H}$           | $2.563^{+0.058}_{-0.060}$       | $\sigma_8(0.61)$            | $0.602^{+0.032}_{-0.024}$ |
| $A_{143}^{\text{dust}}$              | $0.94^{+0.34}_{-0.34}$          | $\text{Age/Gyr}$            | $13.772^{+0.046}_{-0.049}$      | $f\sigma_8(2.33)$           | $0.304^{+0.016}_{-0.012}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.59^{+0.51}_{-0.52}$       | $\sigma_8(2.33)$            | $0.314^{+0.017}_{-0.012}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.31}$          | $r_*$                       | $144.86^{+0.50}_{-0.50}$        | $f_{2000}^{143}$            | $27^{+6}_{-6}$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$               | $1.04124^{+0.00058}_{-0.00057}$ | $f_{2000}^{217}$            | $105.0^{+4.1}_{-4.0}$     |
| $c_{217}$                            | $1.0009^{+0.0031}_{-0.0032}$    | $D_M(z_*)/\text{Gpc}$       | $13.912^{+0.047}_{-0.048}$      | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$            |
| $c_{TE}$                             | $0.992^{+0.011}_{-0.010}$       | $z_{\text{drag}}$           | $1060.08^{+0.73}_{-0.68}$       | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 1.1)$         |
| $c_{EE}$                             | $0.9901^{+0.0095}_{-0.0095}$    | $r_{\text{drag}}$           | $147.48^{+0.52}_{-0.53}$        | $\chi_{\text{CamSpec}}^2$   | $11511.7 (\nu: 15.4)$     |
| $H_0$                                | $68.2^{+1.0}_{-0.98}$           | $k_D$                       | $0.14055^{+0.00064}_{-0.00064}$ | $\chi_{6\text{DF}}^2$       | $0.032 (\nu: 0.0)$        |
| $\Omega_\Lambda$                     | $0.697^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16067^{+0.00039}_{-0.00040}$ | $\chi_{\text{MGS}}^2$       | $1.84 (\nu: 0.1)$         |
| $\Omega_m$                           | $0.303^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3357^{+49}_{-48}$              | $\chi_{\text{DR12BAO}}^2$   | $3.93 (\nu: 0.3)$         |
| $\Omega_m h^2$                       | $0.1411^{+0.0020}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01025^{+0.00015}_{-0.00015}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.5)$          |
| $\Omega_m h^3$                       | $0.09627^{+0.00066}_{-0.00065}$ | $100\theta_{\text{eq}}$     | $0.8219^{+0.0092}_{-0.0093}$    | $\chi_{\text{BAO}}^2$       | $5.80 (\nu: 0.3)$         |
| $\sigma_8$                           | $0.823^{+0.045}_{-0.034}$       | $100\theta_{s,\text{eq}}$   | $0.4538^{+0.0047}_{-0.0048}$    | $\chi_{\text{CMB}}^2$       | $11534.9 (\nu: 16.3)$     |

$$\bar{\chi}_{\text{eff}}^2 = 11548.48; \Delta\bar{\chi}_{\text{eff}}^2 = -0.61; R - 1 = 0.01389$$



### 3.42 base\_Alens\_CamSpecHM\_TTTEEE\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022483 | $0.02246^{+0.00038}_{-0.00038}$ | $\sigma_8$                     | 0.8015   | $0.801^{+0.017}_{-0.018}$       | $100\theta_{\text{eq}}$     | 0.8203   | $0.820^{+0.014}_{-0.014}$    |
| $\Omega_c h^2$                       | 0.11835  | $0.1185^{+0.0032}_{-0.0031}$    | $S_8$                          | 0.8086   | $0.810^{+0.040}_{-0.039}$       | $100\theta_{\text{s,eq}}$   | 0.4530   | $0.4528^{+0.0070}_{-0.0070}$ |
| $100\theta_{\text{MC}}$              | 1.04101  | $1.04102^{+0.00065}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.4429   | $0.443^{+0.022}_{-0.021}$       | $H(0.15)$                   | 73.28    | $73.2^{+1.3}_{-1.3}$         |
| $\tau$                               | 0.0505   | $0.050^{+0.016}_{-0.018}$       | $\sigma_8 \Omega_m^{0.25}$     | 0.5958   | $0.596^{+0.020}_{-0.020}$       | $D_{\text{M}}(0.15)$        | 637.4    | $638^{+13}_{-12}$            |
| $A_{\text{L}}$                       | 1.137    | $1.13^{+0.15}_{-0.14}$          | $\sigma_8/h^{0.5}$             | 0.9714   | $0.972^{+0.029}_{-0.029}$       | $H(0.38)$                   | 83.29    | $83.26^{+0.94}_{-0.93}$      |
| $\ln(10^{10} A_{\text{s}})$          | 3.0311   | $3.030^{+0.033}_{-0.037}$       | $r_{\text{drag}} h$            | 100.33   | $100.2^{+2.5}_{-2.5}$           | $D_{\text{M}}(0.38)$        | 1521.6   | $1523^{+25}_{-25}$           |
| $n_{\text{s}}$                       | 0.9699   | $0.969^{+0.010}_{-0.010}$       | $\langle d^2 \rangle^{1/2}$    | 2.562    | $2.55^{+0.12}_{-0.13}$          | $H(0.51)$                   | 89.95    | $89.92^{+0.75}_{-0.74}$      |
| $y_{\text{cal}}$                     | 0.99982  | $1.0001^{+0.0050}_{-0.0049}$    | $z_{\text{re}}$                | 7.23     | $7.2^{+1.7}_{-1.8}$             | $D_{\text{M}}(0.51)$        | 1972.0   | $1973^{+30}_{-29}$           |
| $A_{100}^{\text{PS}}$                | 224.2    | $234^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | 2.072    | $2.070^{+0.070}_{-0.076}$       | $H(0.61)$                   | 95.52    | $95.50^{+0.62}_{-0.60}$      |
| $A_{143}^{\text{PS}}$                | 49.0     | $36^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8732   | $1.874^{+0.025}_{-0.025}$       | $D_{\text{M}}(0.61)$        | 2295.5   | $2297^{+32}_{-31}$           |
| $A_{217}^{\text{PS}}$                | 107.3    | $104^{+20}_{-30}$               | $D_{40}$                       | 1216.5   | $1219^{+29}_{-29}$              | $H(2.33)$                   | 235.59   | $235.7^{+1.9}_{-1.8}$        |
| $A_{217}^{\text{CIB}}$               | 39.7     | $38^{+10}_{-10}$                | $D_{220}$                      | 5726     | $5728^{+76}_{-78}$              | $D_{\text{M}}(2.33)$        | 5753.6   | $5755^{+27}_{-27}$           |
| $A_{143}^{\text{tSZ}}$               | 6.41     | $< 7.58$                        | $D_{810}$                      | 2529.8   | $2530^{+28}_{-27}$              | $f\sigma_8(0.15)$           | 0.4479   | $0.448^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.758    | $0.67^{+0.25}_{-0.26}$          | $D_{1420}$                     | 814.8    | $814.3^{+9.6}_{-9.6}$           | $\sigma_8(0.15)$            | 0.7412   | $0.741^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.87     | —                               | $D_{2000}$                     | 231.47   | $231.1^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | 0.4674   | $0.468^{+0.016}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.95     | —                               | $n_{\text{s},0.002}$           | 0.9699   | $0.969^{+0.010}_{-0.010}$       | $\sigma_8(0.38)$            | 0.6577   | $0.657^{+0.012}_{-0.013}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}$                 | 0.245438 | $0.24543^{+0.00015}_{-0.00015}$ | $f\sigma_8(0.51)$           | 0.4667   | $0.467^{+0.014}_{-0.015}$    |
| $A_{100}^{\text{dust}}$              | 1.003    | $1.01^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246765 | $0.24675^{+0.00015}_{-0.00015}$ | $\sigma_8(0.51)$            | 0.6157   | $0.615^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{dust}}$              | 0.968    | $0.95^{+0.34}_{-0.34}$          | $10^5 D/\text{H}$              | 2.565    | $2.570^{+0.071}_{-0.068}$       | $f\sigma_8(0.61)$           | 0.4623   | $0.462^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{dust}}$              | 0.986    | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | 13.776   | $13.779^{+0.061}_{-0.060}$      | $\sigma_8(0.61)$            | 0.5861   | $0.586^{+0.010}_{-0.011}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 0.996    | $1.02^{+0.32}_{-0.32}$          | $z_*$                          | 1089.63  | $1089.68^{+0.71}_{-0.68}$       | $f\sigma_8(2.33)$           | 0.2957   | $0.2955^{+0.0051}_{-0.0055}$ |
| $c_{100}$                            | 0.99790  | $0.9976^{+0.0020}_{-0.0021}$    | $r_*$                          | 144.77   | $144.76^{+0.66}_{-0.67}$        | $\sigma_8(2.33)$            | 0.3052   | $0.3049^{+0.0053}_{-0.0056}$ |
| $c_{217}$                            | 1.00108  | $1.0009^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | 1.04119  | $1.04120^{+0.00064}_{-0.00064}$ | $f_{2000}^{143}$            | 27.9     | $28^{+6}_{-6}$               |
| $c_{\text{TE}}$                      | 0.9926   | $0.993^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.905   | $13.903^{+0.061}_{-0.062}$      | $f_{2000}^{217}$            | 104.96   | $105.5^{+4.2}_{-4.2}$        |
| $c_{\text{EE}}$                      | 0.9908   | $0.9908^{+0.0098}_{-0.0097}$    | $z_{\text{drag}}$              | 1060.09  | $1060.03^{+0.74}_{-0.75}$       | $f_{2000}^{143 \times 217}$ | 30.36    | $31^{+4}_{-4}$               |
| $H_0$                                | 68.06    | $68.0^{+1.5}_{-1.5}$            | $r_{\text{drag}}$              | 147.40   | $147.40^{+0.65}_{-0.65}$        | $\chi_{\text{small}}^2$     | 395.68   | $396.8 (\nu: 1.3)$           |
| $\Omega_{\Lambda}$                   | 0.6946   | $0.694^{+0.019}_{-0.020}$       | $k_{\text{D}}$                 | 0.14062  | $0.14061^{+0.00068}_{-0.00069}$ | $\chi_{\text{CamSpec}}^2$   | 11496.2  | $11512.2 (\nu: 15.6)$        |
| $\Omega_{\text{m}}$                  | 0.3054   | $0.306^{+0.020}_{-0.019}$       | $100\theta_{\text{D}}$         | 0.160671 | $0.16070^{+0.00043}_{-0.00042}$ | $\chi_{\text{prior}}^2$     | 1.8      | $7.8 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^2$              | 0.14148  | $0.1416^{+0.0030}_{-0.0029}$    | $z_{\text{eq}}$                | 3365     | $3368^{+71}_{-69}$              | $\chi_{\text{CMB}}^2$       | 11891.9  | $11909.0 (\nu: 16.9)$        |
| $\Omega_{\text{m}} h^3$              | 0.09629  | $0.09627^{+0.00064}_{-0.00065}$ | $k_{\text{eq}}$                | 0.010272 | $0.01028^{+0.00022}_{-0.00021}$ |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11893.69$ ;  $\Delta\chi_{\text{eff}}^2 = -3.79$ ;  $\bar{\chi}_{\text{eff}}^2 = 11916.80$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -2.29$ ;  $R - 1 = 0.00486$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.68 ( $\Delta$  -0.18) CamSpec like\_10.7HM\_1400\_unified: 11496.17 ( $\Delta$  -3.31)



## 4 alpha1

### 4.1 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022139 | $0.02220^{+0.00045}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4615   | $0.461^{+0.026}_{-0.026}$       | $H(0.15)$                   | 72.11    | $72.2^{+1.6}_{-1.5}$         |
| $\Omega_c h^2$              | 0.12106  | $0.1210^{+0.0043}_{-0.0043}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6120   | $0.612^{+0.023}_{-0.023}$       | $D_M(0.15)$                 | 649.1    | $649^{+16}_{-16}$            |
| $100\theta_{MC}$            | 1.04066  | $1.0406^{+0.0011}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9938   | $0.993^{+0.031}_{-0.031}$       | $H(0.38)$                   | 82.42    | $82.5^{+1.2}_{-1.1}$         |
| $\tau$                      | 0.0526   | $0.054^{+0.017}_{-0.016}$       | $r_{drag} h$                | 98.11    | $98.2^{+3.4}_{-3.2}$            | $D_M(0.38)$                 | 1545.1   | $1544^{+32}_{-32}$           |
| $\alpha_{-1}$               | -0.00022 | $-0.0012^{+0.0030}_{-0.0040}$   | $\langle d^2 \rangle^{1/2}$ | 2.456    | $2.457^{+0.077}_{-0.077}$       | $H(0.51)$                   | 89.25    | $89.29^{+0.91}_{-0.84}$      |
| $\ln(10^{10} A_s)$          | 3.0417   | $3.045^{+0.037}_{-0.036}$       | $z_{re}$                    | 7.57     | $7.7^{+1.7}_{-1.7}$             | $D_M(0.51)$                 | 1999.7   | $1999^{+37}_{-38}$           |
| $n_s$                       | 0.9607   | $0.960^{+0.016}_{-0.014}$       | $10^9 A_s$                  | 2.094    | $2.101^{+0.078}_{-0.074}$       | $H(0.61)$                   | 94.96    | $95.00^{+0.72}_{-0.66}$      |
| $y_{cal}$                   | 1.00035  | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8850   | $1.887^{+0.030}_{-0.030}$       | $D_M(0.61)$                 | 2325.4   | $2324^{+39}_{-40}$           |
| $A_{100}^{PS}$              | 240.1    | $244^{+50}_{-50}$               | $D_{40}$                    | 1221.5   | $1216^{+45}_{-40}$              | $H(2.33)$                   | 237.00   | $237.0^{+2.7}_{-2.7}$        |
| $A_{143}^{PS}$              | 39.3     | $41^{+20}_{-20}$                | $D_{220}$                   | 5701     | $5709^{+83}_{-81}$              | $D_M(2.33)$                 | 5779.3   | $5777^{+31}_{-32}$           |
| $A_{217}^{PS}$              | 99.2     | $100^{+30}_{-30}$               | $D_{810}$                   | 2534.4   | $2536^{+28}_{-27}$              | $f\sigma_8(0.15)$           | 0.4651   | $0.465^{+0.024}_{-0.024}$    |
| $A_{217}^{CIB}$             | 45.6     | $41^{+10}_{-10}$                | $D_{1420}$                  | 813.5    | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.7489   | $0.748^{+0.015}_{-0.015}$    |
| $A_{143}^{tSZ}$             | 5.89     | $< 7.32$                        | $D_{2000}$                  | 229.24   | $229.4^{+3.7}_{-3.6}$           | $f\sigma_8(0.38)$           | 0.4808   | $0.480^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{PS}$   | 0.560    | $0.64^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9607   | $0.960^{+0.016}_{-0.014}$       | $\sigma_8(0.38)$            | 0.6626   | $0.662^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{CIB}$  | 0.76     | —                               | $Y_P$                       | 0.245301 | $0.24532^{+0.00019}_{-0.00020}$ | $f\sigma_8(0.51)$           | 0.4780   | $0.478^{+0.016}_{-0.016}$    |
| $\xi^{tSZ \times CIB}$      | 0.02     | —                               | $Y_P^{BBN}$                 | 0.246627 | $0.24665^{+0.00019}_{-0.00021}$ | $\sigma_8(0.51)$            | 0.6195   | $0.619^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | 1.5      | —                               | $10^5 D/H$                  | 2.630    | $2.619^{+0.088}_{-0.083}$       | $f\sigma_8(0.61)$           | 0.4721   | $0.472^{+0.014}_{-0.014}$    |
| $A_{100}^{dust}$            | 1.017    | $1.02^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.833   | $13.829^{+0.071}_{-0.072}$      | $\sigma_8(0.61)$            | 0.5892   | $0.589^{+0.010}_{-0.010}$    |
| $A_{143}^{dust}$            | 0.993    | $0.98^{+0.34}_{-0.34}$          | $z_*$                       | 1090.31  | $1090.23^{+0.79}_{-0.79}$       | $f\sigma_8(2.33)$           | 0.2966   | $0.2965^{+0.0052}_{-0.0051}$ |
| $A_{217}^{dust}$            | 0.962    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.34   | $144.3^{+1.1}_{-1.0}$           | $\sigma_8(2.33)$            | 0.3053   | $0.3052^{+0.0056}_{-0.0054}$ |
| $A_{143 \times 217}^{dust}$ | 1.005    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04086  | $1.0408^{+0.0011}_{-0.0011}$    | $f_{2000}^{143}$            | 31.3     | $31^{+6}_{-6}$               |
| $c_{100}$                   | 0.99750  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.867   | $13.865^{+0.094}_{-0.092}$      | $f_{2000}^{217}$            | 107.80   | $107.7^{+4.1}_{-4.0}$        |
| $c_{217}$                   | 1.00144  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.47  | $1059.60^{+0.98}_{-1.0}$        | $f_{2000}^{143 \times 217}$ | 33.15    | $33^{+4}_{-4}$               |
| $H_0$                       | 66.71    | $66.8^{+1.9}_{-1.8}$            | $r_{drag}$                  | 147.07   | $147.0^{+1.1}_{-1.0}$           | $\chi_{simall}^2$           | 395.89   | $397.1 (\nu: 1.6)$           |
| $\Omega_\Lambda$            | 0.6767   | $0.677^{+0.026}_{-0.027}$       | $k_D$                       | 0.14071  | $0.1408^{+0.0012}_{-0.0013}$    | $\chi_{lowl}^2$             | 22.30    | $22.2 (\nu: 2.8)$            |
| $\Omega_m$                  | 0.3233   | $0.323^{+0.027}_{-0.026}$       | $100\theta_D$               | 0.16101  | $0.16092^{+0.00065}_{-0.00059}$ | $\chi_{CamSpec}^2$          | 7050.8   | $7065.8 (\nu: 17.1)$         |
| $\Omega_m h^2$              | 0.14384  | $0.1438^{+0.0041}_{-0.0041}$    | $z_{eq}$                    | 3422     | $3422^{+99}_{-99}$              | $\chi_{prior}^2$            | 2.4      | $7.6 (\nu: 6.0)$             |
| $\Omega_m h^3$              | 0.09595  | $0.09601^{+0.00091}_{-0.00094}$ | $k_{eq}$                    | 0.010444 | $0.01044^{+0.00030}_{-0.00030}$ | $\chi_{CMB}^2$              | 7469.0   | $7485.1 (\nu: 16.9)$         |
| $\sigma_8$                  | 0.8117   | $0.811^{+0.017}_{-0.017}$       | $100\theta_{eq}$            | 0.8090   | $0.809^{+0.019}_{-0.018}$       |                             |          |                              |
| $S_8$                       | 0.8426   | $0.842^{+0.048}_{-0.048}$       | $100\theta_{s,eq}$          | 0.4473   | $0.4473^{+0.0097}_{-0.0093}$    |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7471.39$ ;  $\Delta\chi_{eff}^2 = -0.35$ ;  $\bar{\chi}_{eff}^2 = 7492.71$ ;  $\Delta\bar{\chi}_{eff}^2 = 1.18$ ;  $R - 1 = 0.00444$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.89 ( $\Delta$  0.05) commander\_dx12\_v3.2.29: 22.30 ( $\Delta$  -1.10) CamSpec like\_10.7HM: 7050.85 ( $\Delta$  0.51)



## 4.2 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02228^{+0.00043}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.016}_{-0.015}$       | $H(0.38)$                   | $82.99^{+0.70}_{-0.69}$      |
| $\Omega_c h^2$              | $0.1190^{+0.0024}_{-0.0024}$    | $\sigma_8/h^{0.5}$          | $0.980^{+0.023}_{-0.022}$       | $D_M(0.38)$                 | $1529^{+19}_{-18}$           |
| $100\theta_{MC}$            | $1.04094^{+0.00097}_{-0.00092}$ | $r_{drag}h$                 | $99.8^{+1.9}_{-1.9}$            | $H(0.51)$                   | $89.69^{+0.57}_{-0.57}$      |
| $\tau$                      | $0.055^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | $2.425^{+0.055}_{-0.054}$       | $D_M(0.51)$                 | $1981^{+22}_{-22}$           |
| $\alpha_{-1}$               | $-0.0007^{+0.0031}_{-0.0037}$   | $z_{re}$                    | $7.7^{+1.7}_{-1.7}$             | $H(0.61)$                   | $95.30^{+0.48}_{-0.49}$      |
| $\ln(10^{10} A_s)$          | $3.042^{+0.038}_{-0.035}$       | $10^9 A_s$                  | $2.096^{+0.081}_{-0.073}$       | $D_M(0.61)$                 | $2305^{+24}_{-24}$           |
| $n_s$                       | $0.966^{+0.012}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.025}_{-0.024}$       | $H(2.33)$                   | $235.8^{+1.6}_{-1.6}$        |
| $y_{cal}$                   | $1.0007^{+0.0049}_{-0.0049}$    | $D_{40}$                    | $1214^{+47}_{-41}$              | $D_M(2.33)$                 | $5765^{+25}_{-23}$           |
| $A_{100}^{PS}$              | $243^{+50}_{-50}$               | $D_{220}$                   | $5716^{+83}_{-83}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$    |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{810}$                   | $2535^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.745^{+0.014}_{-0.014}$    |
| $A_{217}^{PS}$              | $100^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.472^{+0.013}_{-0.012}$    |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{2000}$                  | $229.9^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | $0.661^{+0.012}_{-0.012}$    |
| $A_{143}^{tSZ}$             | $< 7.48$                        | $n_{s,0.002}$               | $0.966^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{PS}$   | $0.64^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24535^{+0.00018}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.618^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24668^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.604^{+0.087}_{-0.078}$       | $\sigma_8(0.61)$            | $0.588^{+0.010}_{-0.010}$    |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.802^{+0.057}_{-0.053}$      | $f\sigma_8(2.33)$           | $0.2968^{+0.0052}_{-0.0051}$ |
| $A_{100}^{dust}$            | $1.02^{+0.39}_{-0.37}$          | $z_*$                       | $1089.95^{+0.64}_{-0.61}$       | $\sigma_8(2.33)$            | $0.3060^{+0.0054}_{-0.0052}$ |
| $A_{143}^{dust}$            | $0.99^{+0.34}_{-0.35}$          | $r_*$                       | $144.77^{+0.68}_{-0.66}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04113^{+0.00098}_{-0.00092}$ | $f_{2000}^{217}$            | $107.4^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.905^{+0.065}_{-0.062}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1059.64^{+0.98}_{-1.0}$        | $\chi_{simall}^2$           | $397.1 (\nu: 1.9)$           |
| $c_{217}$                   | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | $147.47^{+0.77}_{-0.74}$        | $\chi_{lowl}^2$             | $22 (\nu: 3.4)$              |
| $H_0$                       | $67.6^{+1.1}_{-1.1}$            | $k_D$                       | $0.14039^{+0.00099}_{-0.0011}$  | $\chi_{CamSpec}^2$          | $7065.8 (\nu: 17.4)$         |
| $\Omega_\Lambda$            | $0.690^{+0.014}_{-0.015}$       | $100\theta_D$               | $0.16093^{+0.00067}_{-0.00061}$ | $\chi_{6DF}^2$              | $0.061 (\nu: 0.0)$           |
| $\Omega_m$                  | $0.310^{+0.015}_{-0.014}$       | $z_{eq}$                    | $3375^{+57}_{-57}$              | $\chi_{MGS}^2$              | $1.35 (\nu: 0.1)$            |
| $\Omega_m h^2$              | $0.1419^{+0.0024}_{-0.0024}$    | $k_{eq}$                    | $0.01030^{+0.00017}_{-0.00017}$ | $\chi_{DR12BAO}^2$          | $4.8 (\nu: 1.5)$             |
| $\Omega_m h^3$              | $0.09598^{+0.00092}_{-0.00098}$ | $100\theta_{eq}$            | $0.818^{+0.011}_{-0.010}$       | $\chi_{prior}^2$            | $7.7 (\nu: 6.0)$             |
| $\sigma_8$                  | $0.806^{+0.016}_{-0.015}$       | $100\theta_{s,eq}$          | $0.4519^{+0.0055}_{-0.0055}$    | $\chi_{BAO}^2$              | $6.3 (\nu: 1.0)$             |
| $S_8$                       | $0.820^{+0.030}_{-0.029}$       | $H(0.15)$                   | $72.91^{+0.93}_{-0.92}$         | $\chi_{CMB}^2$              | $7485.4 (\nu: 17.0)$         |
| $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $641.0^{+9.2}_{-9.0}$           |                             |                              |

$$\bar{\chi}_{eff}^2 = 7499.33; \Delta \bar{\chi}_{eff}^2 = 1.77; R - 1 = 0.01534$$



### 4.3 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02222^{+0.00044}_{-0.00045}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.458^{+0.018}_{-0.018}$       | $H(0.15)$                   | $72.3^{+1.3}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1206^{+0.0032}_{-0.0032}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $647^{+13}_{-13}$            |
| $100\theta_{\mathrm{MC}}$                | $1.0406^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$                    | $0.990^{+0.020}_{-0.021}$       | $H(0.38)$                   | $82.57^{+0.93}_{-0.88}$      |
| $\tau$                                   | $0.054^{+0.016}_{-0.016}$       | $r_{\mathrm{drag}} h$                 | $98.5^{+2.6}_{-2.5}$            | $D_{\mathrm{M}}(0.38)$      | $1541^{+25}_{-25}$           |
| $\alpha_{-1}$                            | $-0.0012^{+0.0029}_{-0.0039}$   | $\langle d^2 \rangle^{1/2}$           | $2.450^{+0.050}_{-0.050}$       | $H(0.51)$                   | $89.37^{+0.74}_{-0.71}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.044^{+0.032}_{-0.031}$       | $z_{\mathrm{re}}$                     | $7.7^{+1.5}_{-1.6}$             | $D_{\mathrm{M}}(0.51)$      | $1995^{+29}_{-30}$           |
| $n_{\mathrm{s}}$                         | $0.960^{+0.014}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.100^{+0.069}_{-0.064}$       | $H(0.61)$                   | $95.05^{+0.60}_{-0.58}$      |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.885^{+0.025}_{-0.025}$       | $D_{\mathrm{M}}(0.61)$      | $2320^{+31}_{-32}$           |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{40}$                              | $1216^{+45}_{-39}$              | $H(2.33)$                   | $236.8^{+2.0}_{-2.0}$        |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{220}$                             | $5712^{+83}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5775^{+29}_{-28}$           |
| $A_{217}^{\mathrm{PS}}$                  | $100^{+30}_{-30}$               | $D_{810}$                             | $2536^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.462^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.32$                        | $D_{2000}$                            | $229.4^{+3.7}_{-3.6}$           | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.64^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.960^{+0.014}_{-0.013}$       | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0097}$   |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24533^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24666^{+0.00018}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.6189^{+0.0095}_{-0.0092}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.615^{+0.087}_{-0.081}$       | $f\sigma_8(0.61)$           | $0.4704^{+0.0091}_{-0.0095}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.38}_{-0.37}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.823^{+0.065}_{-0.064}$      | $\sigma_8(0.61)$            | $0.5886^{+0.0092}_{-0.0089}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.35}$          | $z_*$                                 | $1090.16^{+0.71}_{-0.70}$       | $f\sigma_8(2.33)$           | $0.2965^{+0.0049}_{-0.0047}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $r_*$                                 | $144.40^{+0.83}_{-0.79}$        | $\sigma_8(2.33)$            | $0.3053^{+0.0055}_{-0.0052}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.0408^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.873^{+0.074}_{-0.072}$      | $f_{2000}^{217}$            | $107.7^{+4.0}_{-4.0}$        |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.63^{+0.95}_{-1.0}$        | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $H_0$                                    | $66.9^{+1.5}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.11^{+0.88}_{-0.84}$        | $\chi_{\mathrm{lensing}}^2$ | $9.52 (\nu: 0.4)$            |
| $\Omega_{\Lambda}$                       | $0.680^{+0.020}_{-0.021}$       | $k_{\mathrm{D}}$                      | $0.1407^{+0.0010}_{-0.0011}$    | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.4)$           |
| $\Omega_{\mathrm{m}}$                    | $0.320^{+0.021}_{-0.020}$       | $100\theta_{\mathrm{D}}$              | $0.16091^{+0.00065}_{-0.00059}$ | $\chi_{\mathrm{lowl}}^2$    | $22.2 (\nu: 2.8)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1434^{+0.0031}_{-0.0032}$    | $z_{\mathrm{eq}}$                     | $3412^{+74}_{-75}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7065.3 (\nu: 16.5)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.09601^{+0.00091}_{-0.00094}$ | $k_{\mathrm{eq}}$                     | $0.01042^{+0.00023}_{-0.00023}$ | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.810^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.811^{+0.014}_{-0.014}$       | $\chi_{\mathrm{CMB}}^2$     | $7494.0 (\nu: 17.3)$         |
| $S_8$                                    | $0.837^{+0.032}_{-0.033}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4482^{+0.0073}_{-0.0070}$    |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7501.64$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.40$ ;  $R - 1 = 0.00636$



#### 4.4 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02228^{+0.00043}_{-0.00045}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.95^{+0.66}_{-0.64}$      |
| $\Omega_c h^2$              | $0.1192^{+0.0022}_{-0.0022}$    | $\sigma_8/h^{0.5}$          | $0.984^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | $1530^{+17}_{-17}$           |
| $100\theta_{MC}$            | $1.04091^{+0.00095}_{-0.00091}$ | $r_{drag}h$                 | $99.6^{+1.7}_{-1.7}$            | $H(0.51)$                   | $89.66^{+0.55}_{-0.54}$      |
| $\tau$                      | $0.057^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | $2.434^{+0.042}_{-0.042}$       | $D_M(0.51)$                 | $1983^{+20}_{-20}$           |
| $\alpha_{-1}$               | $-0.0007^{+0.0030}_{-0.0038}$   | $z_{re}$                    | $7.9^{+1.6}_{-1.5}$             | $H(0.61)$                   | $95.28^{+0.47}_{-0.47}$      |
| $\ln(10^{10} A_s)$          | $3.047^{+0.034}_{-0.031}$       | $10^9 A_s$                  | $2.105^{+0.074}_{-0.065}$       | $D_M(0.61)$                 | $2307^{+22}_{-22}$           |
| $n_s$                       | $0.965^{+0.012}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.880^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.5}$        |
| $y_{cal}$                   | $1.0009^{+0.0048}_{-0.0048}$    | $D_{40}$                    | $1216^{+47}_{-39}$              | $D_M(2.33)$                 | $5766^{+24}_{-23}$           |
| $A_{100}^{PS}$              | $243^{+50}_{-50}$               | $D_{220}$                   | $5721^{+81}_{-81}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-9.9}$              | $f\sigma_8(0.38)$           | $0.4741^{+0.0099}_{-0.010}$  |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{2000}$                  | $230.0^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0098}$   |
| $A_{143}^{tSZ}$             | $< 7.44$                        | $n_{s,0.002}$               | $0.965^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.4727^{+0.0089}_{-0.0090}$ |
| $r_{143 \times 217}^{PS}$   | $0.64^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24536^{+0.00018}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.6198^{+0.0094}_{-0.0091}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24668^{+0.00018}_{-0.00019}$ | $f\sigma_8(0.61)$           | $0.4677^{+0.0082}_{-0.0082}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.603^{+0.086}_{-0.078}$       | $\sigma_8(0.61)$            | $0.5897^{+0.0090}_{-0.0088}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.803^{+0.056}_{-0.053}$      | $f\sigma_8(2.33)$           | $0.2974^{+0.0046}_{-0.0045}$ |
| $A_{100}^{dust}$            | $1.02^{+0.39}_{-0.37}$          | $z_*$                       | $1089.96^{+0.62}_{-0.61}$       | $\sigma_8(2.33)$            | $0.3066^{+0.0049}_{-0.0049}$ |
| $A_{143}^{dust}$            | $0.98^{+0.34}_{-0.35}$          | $r_*$                       | $144.71^{+0.63}_{-0.60}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.04110^{+0.00096}_{-0.00091}$ | $f_{2000}^{217}$            | $107.4^{+3.9}_{-3.9}$        |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.33}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.899^{+0.059}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1059.67^{+0.98}_{-1.1}$        | $\chi_{lensing}^2$          | $9.35 (\nu: 0.3)$            |
| $c_{217}$                   | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | $147.40^{+0.74}_{-0.68}$        | $\chi_{simall}^2$           | $397.3 (\nu: 2.0)$           |
| $H_0$                       | $67.6^{+1.0}_{-0.98}$           | $k_D$                       | $0.14047^{+0.00094}_{-0.0010}$  | $\chi_{lowl}^2$             | $23 (\nu: 3.4)$              |
| $\Omega_\Lambda$            | $0.689^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16091^{+0.00066}_{-0.00060}$ | $\chi_{CamSpec}^2$          | $7065.2 (\nu: 16.4)$         |
| $\Omega_m$                  | $0.311^{+0.013}_{-0.013}$       | $z_{eq}$                    | $3381^{+51}_{-53}$              | $\chi_{6DF}^2$              | $0.065 (\nu: 0.0)$           |
| $\Omega_m h^2$              | $0.1421^{+0.0021}_{-0.0022}$    | $k_{eq}$                    | $0.01032^{+0.00015}_{-0.00016}$ | $\chi_{MGS}^2$              | $1.25 (\nu: 0.1)$            |
| $\Omega_m h^3$              | $0.09602^{+0.00089}_{-0.00095}$ | $100\theta_{eq}$            | $0.8169^{+0.0096}_{-0.0093}$    | $\chi_{DR12BAO}^2$          | $5.0 (\nu: 1.4)$             |
| $\sigma_8$                  | $0.808^{+0.013}_{-0.012}$       | $100\theta_{s,eq}$          | $0.4513^{+0.0050}_{-0.0048}$    | $\chi_{prior}^2$            | $7.6 (\nu: 5.9)$             |
| $S_8$                       | $0.824^{+0.023}_{-0.024}$       | $H(0.15)$                   | $72.84^{+0.86}_{-0.85}$         | $\chi_{CMB}^2$              | $7494.3 (\nu: 17.2)$         |
| $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | $641.7^{+8.5}_{-8.5}$           | $\chi_{BAO}^2$              | $6.3 (\nu: 0.9)$             |

$$\bar{\chi}_{eff}^2 = 7508.28; \Delta \bar{\chi}_{eff}^2 = 1.80; R - 1 = 0.01595$$



#### 4.5 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02221^{+0.00045}_{-0.00045}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.461^{+0.026}_{-0.026}$       | $H(0.15)$                   | $72.2^{+1.6}_{-1.5}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1210^{+0.0043}_{-0.0043}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.612^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.15)$      | $648^{+16}_{-16}$            |
| $100\theta_{\mathrm{MC}}$                | $1.0406^{+0.0011}_{-0.0011}$    | $\sigma_8/h^{0.5}$                    | $0.994^{+0.030}_{-0.031}$       | $H(0.38)$                   | $82.5^{+1.2}_{-1.1}$         |
| $\tau$                                   | $0.055^{+0.014}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $98.2^{+3.4}_{-3.2}$            | $D_{\mathrm{M}}(0.38)$      | $1544^{+31}_{-32}$           |
| $\alpha_{-1}$                            | $-0.0013^{+0.0030}_{-0.0040}$   | $\langle d^2 \rangle^{1/2}$           | $2.459^{+0.075}_{-0.076}$       | $H(0.51)$                   | $89.31^{+0.91}_{-0.84}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.048^{+0.032}_{-0.030}$       | $z_{\mathrm{re}}$                     | $< 9.06$                        | $D_{\mathrm{M}}(0.51)$      | $1998^{+37}_{-38}$           |
| $n_{\mathrm{s}}$                         | $0.960^{+0.016}_{-0.014}$       | $10^9 A_{\mathrm{s}}$                 | $2.107^{+0.068}_{-0.063}$       | $H(0.61)$                   | $95.01^{+0.72}_{-0.66}$      |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.887^{+0.029}_{-0.030}$       | $D_{\mathrm{M}}(0.61)$      | $2324^{+39}_{-40}$           |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{40}$                              | $1216^{+44}_{-40}$              | $H(2.33)$                   | $237.0^{+2.6}_{-2.7}$        |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{220}$                             | $5710^{+83}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5777^{+31}_{-32}$           |
| $A_{217}^{\mathrm{PS}}$                  | $100^{+30}_{-30}$               | $D_{810}$                             | $2536^{+28}_{-27}$              | $f\sigma_8(0.15)$           | $0.465^{+0.024}_{-0.024}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.749^{+0.014}_{-0.014}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.34$                        | $D_{2000}$                            | $229.4^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | $0.481^{+0.018}_{-0.019}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.64^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.960^{+0.016}_{-0.014}$       | $\sigma_8(0.38)$            | $0.663^{+0.011}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24532^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.478^{+0.016}_{-0.016}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24665^{+0.00018}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.620^{+0.011}_{-0.0093}$   |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.617^{+0.086}_{-0.082}$       | $f\sigma_8(0.61)$           | $0.472^{+0.014}_{-0.014}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.827^{+0.070}_{-0.072}$      | $\sigma_8(0.61)$            | $0.5896^{+0.0094}_{-0.0091}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.21^{+0.78}_{-0.78}$       | $f\sigma_8(2.33)$           | $0.2969^{+0.0047}_{-0.0045}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $144.3^{+1.1}_{-1.0}$           | $\sigma_8(2.33)$            | $0.3056^{+0.0050}_{-0.0048}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.0408^{+0.0011}_{-0.0011}$    | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.865^{+0.095}_{-0.092}$      | $f_{2000}^{217}$            | $107.7^{+4.0}_{-3.9}$        |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.62^{+0.96}_{-1.0}$        | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $H_0$                                    | $66.8^{+1.9}_{-1.8}$            | $r_{\mathrm{drag}}$                   | $147.0^{+1.1}_{-1.0}$           | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.6)$           |
| $\Omega_{\Lambda}$                       | $0.677^{+0.026}_{-0.027}$       | $k_{\mathrm{D}}$                      | $0.1408^{+0.0012}_{-0.0013}$    | $\chi_{\mathrm{lowl}}^2$    | $22.2 (\nu: 2.6)$            |
| $\Omega_{\mathrm{m}}$                    | $0.323^{+0.027}_{-0.026}$       | $100\theta_{\mathrm{D}}$              | $0.16091^{+0.00064}_{-0.00058}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7065.7 (\nu: 17.0)$         |
| $\Omega_{\mathrm{m}} h^2$                | $0.1438^{+0.0041}_{-0.0042}$    | $z_{\mathrm{eq}}$                     | $3421^{+99}_{-99}$              | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.09603^{+0.00091}_{-0.00093}$ | $k_{\mathrm{eq}}$                     | $0.01044^{+0.00030}_{-0.00030}$ | $\chi_{\mathrm{CMB}}^2$     | $7484.8 (\nu: 16.4)$         |
| $\sigma_8$                               | $0.812^{+0.017}_{-0.016}$       | $100\theta_{\mathrm{eq}}$             | $0.809^{+0.019}_{-0.018}$       |                             |                              |
| $S_8$                                    | $0.842^{+0.048}_{-0.048}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4474^{+0.0097}_{-0.0093}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7492.46; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 1.20; R - 1 = 0.00453$$



#### 4.6 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02228^{+0.00042}_{-0.00045}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.016}_{-0.015}$       | $H(0.38)$                   | $83.00^{+0.70}_{-0.68}$      |
| $\Omega_c h^2$                       | $0.1190^{+0.0024}_{-0.0024}$    | $\sigma_8/h^{0.5}$          | $0.981^{+0.023}_{-0.021}$       | $D_M(0.38)$                 | $1529^{+18}_{-18}$           |
| $100\theta_{MC}$                     | $1.04093^{+0.00097}_{-0.00092}$ | $r_{\text{drag}} h$         | $99.8^{+1.9}_{-1.9}$            | $H(0.51)$                   | $89.70^{+0.57}_{-0.57}$      |
| $\tau$                               | $0.056^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$ | $2.428^{+0.054}_{-0.051}$       | $D_M(0.51)$                 | $1981^{+22}_{-22}$           |
| $\alpha_{-1}$                        | $-0.0007^{+0.0030}_{-0.0037}$   | $z_{\text{re}}$             | $< 9.11$                        | $H(0.61)$                   | $95.30^{+0.48}_{-0.49}$      |
| $\ln(10^{10} A_s)$                   | $3.045^{+0.033}_{-0.030}$       | $10^9 A_s$                  | $2.101^{+0.069}_{-0.063}$       | $D_M(0.61)$                 | $2305^{+23}_{-24}$           |
| $n_s$                                | $0.965^{+0.012}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.025}_{-0.024}$       | $H(2.33)$                   | $235.8^{+1.6}_{-1.6}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $D_{40}$                    | $1214^{+47}_{-41}$              | $D_M(2.33)$                 | $5765^{+25}_{-23}$           |
| $A_{100}^{\text{PS}}$                | $243^{+50}_{-50}$               | $D_{220}$                   | $5716^{+82}_{-82}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                   | $2535^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.746^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{PS}}$                | $100^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.473^{+0.013}_{-0.012}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{2000}$                  | $229.9^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.49$                        | $n_{s,0.002}$               | $0.965^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.64^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24536^{+0.00018}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.619^{+0.010}_{-0.0099}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P^{\text{BBN}}$          | $0.24668^{+0.00018}_{-0.00019}$ | $f\sigma_8(0.61)$           | $0.467^{+0.010}_{-0.0099}$   |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 D/H$                  | $2.602^{+0.087}_{-0.077}$       | $\sigma_8(0.61)$            | $0.589^{+0.010}_{-0.0089}$   |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.801^{+0.057}_{-0.053}$      | $f\sigma_8(2.33)$           | $0.2971^{+0.0049}_{-0.0045}$ |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.39}_{-0.38}$          | $z_*$                       | $1089.94^{+0.64}_{-0.60}$       | $\sigma_8(2.33)$            | $0.3063^{+0.0052}_{-0.0047}$ |
| $A_{143}^{\text{dust}}$              | $0.99^{+0.34}_{-0.35}$          | $r_*$                       | $144.77^{+0.68}_{-0.66}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.04112^{+0.00097}_{-0.00092}$ | $f_{2000}^{217}$            | $107.4^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.905^{+0.065}_{-0.062}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.66^{+0.96}_{-1.1}$        | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 2.0)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $147.46^{+0.78}_{-0.73}$        | $\chi_{\text{lowl}}^2$      | $22 (\nu: 3.3)$              |
| $H_0$                                | $67.7^{+1.1}_{-1.1}$            | $k_D$                       | $0.14041^{+0.00099}_{-0.0011}$  | $\chi_{\text{CamSpec}}^2$   | $7065.7 (\nu: 17.2)$         |
| $\Omega_\Lambda$                     | $0.690^{+0.014}_{-0.015}$       | $100\theta_D$               | $0.16092^{+0.00066}_{-0.00060}$ | $\chi_{6\text{DF}}^2$       | $0.060 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.310^{+0.015}_{-0.014}$       | $z_{\text{eq}}$             | $3375^{+57}_{-57}$              | $\chi_{\text{MGS}}^2$       | $1.35 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1419^{+0.0024}_{-0.0024}$    | $k_{\text{eq}}$             | $0.01030^{+0.00018}_{-0.00017}$ | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 1.5)$             |
| $\Omega_m h^3$                       | $0.09599^{+0.00092}_{-0.00097}$ | $100\theta_{\text{eq}}$     | $0.818^{+0.011}_{-0.011}$       | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 6.0)$             |
| $\sigma_8$                           | $0.807^{+0.015}_{-0.014}$       | $100\theta_{s,\text{eq}}$   | $0.4519^{+0.0055}_{-0.0055}$    | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 1.0)$             |
| $S_8$                                | $0.820^{+0.029}_{-0.029}$       | $H(0.15)$                   | $72.92^{+0.93}_{-0.92}$         | $\chi_{\text{CMB}}^2$       | $7485.2 (\nu: 16.5)$         |
| $\sigma_8 \Omega_m^{0.5}$            | $0.449^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $640.9^{+9.2}_{-9.1}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7499.10; \Delta \bar{\chi}_{\text{eff}}^2 = 1.79; R - 1 = 0.01710$$



#### 4.7 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02223^{+0.00044}_{-0.00045}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.458^{+0.018}_{-0.018}$       | $H(0.15)$                   | $72.3^{+1.3}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1205^{+0.0031}_{-0.0032}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $647^{+12}_{-12}$            |
| $100\theta_{\mathrm{MC}}$                | $1.0406^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$                    | $0.990^{+0.020}_{-0.021}$       | $H(0.38)$                   | $82.60^{+0.92}_{-0.86}$      |
| $\tau$                                   | $0.055^{+0.014}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $98.5^{+2.6}_{-2.4}$            | $D_{\mathrm{M}}(0.38)$      | $1540^{+24}_{-25}$           |
| $\alpha_{-1}$                            | $-0.0012^{+0.0029}_{-0.0039}$   | $\langle d^2 \rangle^{1/2}$           | $2.451^{+0.050}_{-0.050}$       | $H(0.51)$                   | $89.39^{+0.73}_{-0.69}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.047^{+0.029}_{-0.027}$       | $z_{\mathrm{re}}$                     | $< 8.99$                        | $D_{\mathrm{M}}(0.51)$      | $1994^{+28}_{-29}$           |
| $n_{\mathrm{s}}$                         | $0.961^{+0.014}_{-0.012}$       | $10^9 A_{\mathrm{s}}$                 | $2.104^{+0.060}_{-0.056}$       | $H(0.61)$                   | $95.07^{+0.60}_{-0.57}$      |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.885^{+0.024}_{-0.024}$       | $D_{\mathrm{M}}(0.61)$      | $2319^{+30}_{-31}$           |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{40}$                              | $1215^{+44}_{-38}$              | $H(2.33)$                   | $236.7^{+1.9}_{-2.0}$        |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{220}$                             | $5713^{+83}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5774^{+28}_{-28}$           |
| $A_{217}^{\mathrm{PS}}$                  | $100^{+30}_{-30}$               | $D_{810}$                             | $2536^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.462^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.010}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.35$                        | $D_{2000}$                            | $229.4^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.479^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.64^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.961^{+0.014}_{-0.012}$       | $\sigma_8(0.38)$            | $0.6623^{+0.0096}_{-0.0086}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24533^{+0.00018}_{-0.00019}$ | $f\sigma_8(0.51)$           | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24666^{+0.00018}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.6194^{+0.0087}_{-0.0084}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.613^{+0.086}_{-0.080}$       | $f\sigma_8(0.61)$           | $0.4706^{+0.0091}_{-0.0095}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.822^{+0.064}_{-0.063}$      | $\sigma_8(0.61)$            | $0.5892^{+0.0084}_{-0.0081}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.14^{+0.69}_{-0.69}$       | $f\sigma_8(2.33)$           | $0.2967^{+0.0044}_{-0.0043}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $r_*$                                 | $144.41^{+0.82}_{-0.77}$        | $\sigma_8(2.33)$            | $0.3056^{+0.0049}_{-0.0048}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.0408^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.875^{+0.073}_{-0.071}$      | $f_{2000}^{217}$            | $107.6^{+4.0}_{-4.0}$        |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.65^{+0.97}_{-1.0}$        | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $H_0$                                    | $67.0^{+1.5}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.12^{+0.88}_{-0.82}$        | $\chi_{\mathrm{lensing}}^2$ | $9.50 (\nu: 0.4)$            |
| $\Omega_{\Lambda}$                       | $0.680^{+0.020}_{-0.020}$       | $k_{\mathrm{D}}$                      | $0.1407^{+0.0010}_{-0.0011}$    | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $\Omega_{\mathrm{m}}$                    | $0.320^{+0.020}_{-0.020}$       | $100\theta_{\mathrm{D}}$              | $0.16090^{+0.00064}_{-0.00059}$ | $\chi_{\mathrm{lowl}}^2$    | $22.1 (\nu: 2.7)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1434^{+0.0030}_{-0.0031}$    | $z_{\mathrm{eq}}$                     | $3410^{+73}_{-75}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7065.2 (\nu: 16.5)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.09601^{+0.00090}_{-0.00093}$ | $k_{\mathrm{eq}}$                     | $0.01041^{+0.00022}_{-0.00023}$ | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.810^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.811^{+0.014}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.7 (\nu: 16.8)$         |
| $S_8$                                    | $0.837^{+0.032}_{-0.032}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4484^{+0.0072}_{-0.0069}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7501.39; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 1.38; R - 1 = 0.00867$$



#### 4.8 base\_alpha1\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02229^{+0.00043}_{-0.00045}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.95^{+0.66}_{-0.64}$      |
| $\Omega_c h^2$              | $0.1192^{+0.0022}_{-0.0022}$    | $\sigma_8/h^{0.5}$          | $0.984^{+0.017}_{-0.018}$       | $D_M(0.38)$                 | $1530^{+17}_{-17}$           |
| $100\theta_{MC}$            | $1.04090^{+0.00094}_{-0.00091}$ | $r_{drag}h$                 | $99.6^{+1.7}_{-1.7}$            | $H(0.51)$                   | $89.67^{+0.55}_{-0.53}$      |
| $\tau$                      | $0.057^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$ | $2.435^{+0.042}_{-0.041}$       | $D_M(0.51)$                 | $1982^{+20}_{-20}$           |
| $\alpha_{-1}$               | $-0.0008^{+0.0030}_{-0.0038}$   | $z_{re}$                    | $8.0^{+1.3}_{-1.4}$             | $H(0.61)$                   | $95.28^{+0.47}_{-0.47}$      |
| $\ln(10^{10} A_s)$          | $3.048^{+0.031}_{-0.029}$       | $10^9 A_s$                  | $2.108^{+0.065}_{-0.061}$       | $D_M(0.61)$                 | $2307^{+22}_{-22}$           |
| $n_s$                       | $0.965^{+0.012}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.880^{+0.023}_{-0.023}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.5}$        |
| $y_{cal}$                   | $1.0008^{+0.0048}_{-0.0048}$    | $D_{40}$                    | $1216^{+46}_{-39}$              | $D_M(2.33)$                 | $5765^{+24}_{-23}$           |
| $A_{100}^{PS}$              | $243^{+50}_{-50}$               | $D_{220}$                   | $5721^{+81}_{-81}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-9.8}$              | $f\sigma_8(0.38)$           | $0.4742^{+0.0099}_{-0.010}$  |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{2000}$                  | $230.0^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | $0.6626^{+0.0098}_{-0.0092}$ |
| $A_{143}^{tSZ}$             | $< 7.46$                        | $n_{s,0.002}$               | $0.965^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.4728^{+0.0088}_{-0.0089}$ |
| $r_{143 \times 217}^{PS}$   | $0.64^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24536^{+0.00018}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.6201^{+0.0093}_{-0.0086}$ |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24668^{+0.00018}_{-0.00019}$ | $f\sigma_8(0.61)$           | $0.4679^{+0.0081}_{-0.0081}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.602^{+0.086}_{-0.078}$       | $\sigma_8(0.61)$            | $0.5900^{+0.0089}_{-0.0083}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.803^{+0.055}_{-0.052}$      | $f\sigma_8(2.33)$           | $0.2975^{+0.0045}_{-0.0042}$ |
| $A_{100}^{dust}$            | $1.02^{+0.39}_{-0.37}$          | $z_*$                       | $1089.95^{+0.62}_{-0.61}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0048}_{-0.0045}$ |
| $A_{143}^{dust}$            | $0.98^{+0.34}_{-0.35}$          | $r_*$                       | $144.71^{+0.63}_{-0.60}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.04110^{+0.00095}_{-0.00090}$ | $f_{2000}^{217}$            | $107.4^{+3.9}_{-3.9}$        |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.33}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.900^{+0.060}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1059.68^{+0.97}_{-1.0}$        | $\chi_{lensing}^2$          | $9.32 (\nu: 0.3)$            |
| $c_{217}$                   | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | $147.40^{+0.74}_{-0.68}$        | $\chi_{simall}^2$           | $397.3 (\nu: 2.0)$           |
| $H_0$                       | $67.6^{+1.0}_{-0.97}$           | $k_D$                       | $0.14047^{+0.00094}_{-0.0010}$  | $\chi_{lowl}^2$             | $22 (\nu: 3.3)$              |
| $\Omega_\Lambda$            | $0.689^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16090^{+0.00065}_{-0.00060}$ | $\chi_{CamSpec}^2$          | $7065.2 (\nu: 16.4)$         |
| $\Omega_m$                  | $0.311^{+0.013}_{-0.013}$       | $z_{eq}$                    | $3380^{+51}_{-52}$              | $\chi_{6DF}^2$              | $0.063 (\nu: 0.0)$           |
| $\Omega_m h^2$              | $0.1421^{+0.0021}_{-0.0022}$    | $k_{eq}$                    | $0.01032^{+0.00015}_{-0.00016}$ | $\chi_{MGS}^2$              | $1.26 (\nu: 0.1)$            |
| $\Omega_m h^3$              | $0.09602^{+0.00089}_{-0.00095}$ | $100\theta_{eq}$            | $0.8170^{+0.0096}_{-0.0093}$    | $\chi_{DR12BAO}^2$          | $5.0 (\nu: 1.4)$             |
| $\sigma_8$                  | $0.809^{+0.012}_{-0.012}$       | $100\theta_{s,eq}$          | $0.4514^{+0.0050}_{-0.0048}$    | $\chi_{prior}^2$            | $7.6 (\nu: 5.9)$             |
| $S_8$                       | $0.824^{+0.023}_{-0.024}$       | $H(0.15)$                   | $72.85^{+0.86}_{-0.84}$         | $\chi_{CMB}^2$              | $7494.2 (\nu: 16.9)$         |
| $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | $641.6^{+8.4}_{-8.5}$           | $\chi_{BAO}^2$              | $6.3 (\nu: 0.9)$             |

$$\bar{\chi}_{eff}^2 = 7508.12; \Delta \bar{\chi}_{eff}^2 = 1.79; R - 1 = 0.01736$$



## 5 mnu

### 5.1 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022145 | $0.02205^{+0.00048}_{-0.00051}$ | $S_8$                       | 0.841    | $0.833^{+0.049}_{-0.051}$       | $100\theta_{s,eq}$          | 0.4485   | $0.4477^{+0.0093}_{-0.0093}$ |
| $\Omega_c h^2$              | 0.12051  | $0.1210^{+0.0045}_{-0.0043}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4607   | $0.456^{+0.027}_{-0.028}$       | $H(0.15)$                   | 72.77    | $71.2^{+2.9}_{-4.0}$         |
| $100\theta_{MC}$            | 1.04085  | $1.04070^{+0.00098}_{-0.0010}$  | $\sigma_8 \Omega_m^{0.25}$  | 0.6158   | $0.599^{+0.036}_{-0.045}$       | $D_M(0.15)$                 | 642.4    | $659^{+44}_{-31}$            |
| $\tau$                      | 0.0507   | $0.052^{+0.017}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 1.002    | $0.971^{+0.058}_{-0.079}$       | $H(0.38)$                   | 82.92    | $81.7^{+2.2}_{-3.0}$         |
| $\Sigma m_\nu$ [eV]         | 0.001    | $< 0.569$                       | $r_{drag} h$                | 99.3     | $96.7^{+5.5}_{-7.2}$            | $D_M(0.38)$                 | 1532     | $1564^{+87}_{-61}$           |
| $\ln(10^{10} A_s)$          | 3.0361   | $3.039^{+0.034}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$ | 2.454    | $2.444^{+0.075}_{-0.074}$       | $H(0.51)$                   | 89.66    | $88.7^{+1.8}_{-2.5}$         |
| $n_s$                       | 0.9637   | $0.962^{+0.012}_{-0.012}$       | $z_{re}$                    | 7.36     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.51)$                 | 1984     | $2022^{+100}_{-72}$          |
| $y_{cal}$                   | 1.00034  | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.082    | $2.088^{+0.071}_{-0.065}$       | $H(0.61)$                   | 95.30    | $94.5^{+1.5}_{-2.1}$         |
| $A_{100}^{PS}$              | 239.3    | $244^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8816   | $1.883^{+0.027}_{-0.027}$       | $D_M(0.61)$                 | 2308     | $2350^{+110}_{-78}$          |
| $A_{143}^{PS}$              | 38.7     | $42^{+20}_{-20}$                | $D_{40}$                    | 1229.4   | $1230^{+30}_{-29}$              | $H(2.33)$                   | 236.34   | $237.6^{+4.0}_{-3.5}$        |
| $A_{217}^{PS}$              | 99.7     | $101^{+30}_{-30}$               | $D_{220}$                   | 5703     | $5701^{+81}_{-83}$              | $D_M(2.33)$                 | 5763     | $5806^{+110}_{-74}$          |
| $A_{217}^{CIB}$             | 44.5     | $41^{+10}_{-10}$                | $D_{810}$                   | 2533.4   | $2535^{+28}_{-28}$              | $f\sigma_8(0.15)$           | 0.4644   | $0.460^{+0.025}_{-0.027}$    |
| $A_{143}^{tSZ}$             | 5.47     | $< 7.25$                        | $D_{1420}$                  | 813.9    | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.760    | $0.725^{+0.048}_{-0.082}$    |
| $r_{143 \times 217}^{PS}$   | 0.578    | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | 229.58   | $229.1^{+3.8}_{-3.9}$           | $f\sigma_8(0.38)$           | 0.4824   | $0.472^{+0.027}_{-0.031}$    |
| $r_{143 \times 217}^{CIB}$  | 0.71     | —                               | $n_{s,0.002}$               | 0.9637   | $0.962^{+0.012}_{-0.012}$       | $\sigma_8(0.38)$            | 0.673    | $0.641^{+0.044}_{-0.076}$    |
| $\xi^{tSZ \times CIB}$      | 0.04     | —                               | $Y_P$                       | 0.245303 | $0.24526^{+0.00020}_{-0.00024}$ | $f\sigma_8(0.51)$           | 0.4807   | $0.468^{+0.027}_{-0.035}$    |
| $A^{kSZ}$                   | 1.8      | —                               | $Y_P^{BBN}$                 | 0.246629 | $0.24658^{+0.00020}_{-0.00024}$ | $\sigma_8(0.51)$            | 0.630    | $0.599^{+0.041}_{-0.073}$    |
| $A_{100}^{dust}$            | 1.014    | $1.01^{+0.38}_{-0.37}$          | $10^5 D/H$                  | 2.629    | $2.65^{+0.10}_{-0.090}$         | $f\sigma_8(0.61)$           | 0.4755   | $0.462^{+0.027}_{-0.037}$    |
| $A_{143}^{dust}$            | 0.980    | $0.98^{+0.34}_{-0.35}$          | Age/Gyr                     | 13.796   | $13.90^{+0.25}_{-0.17}$         | $\sigma_8(0.61)$            | 0.599    | $0.569^{+0.040}_{-0.070}$    |
| $A_{217}^{dust}$            | 0.965    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1090.25  | $1090.44^{+0.99}_{-0.95}$       | $f\sigma_8(2.33)$           | 0.3011   | $0.288^{+0.018}_{-0.033}$    |
| $A_{143 \times 217}^{dust}$ | 1.011    | $1.03^{+0.32}_{-0.31}$          | $r_*$                       | 144.48   | $144.39^{+0.97}_{-1.0}$         | $\sigma_8(2.33)$            | 0.3108   | $0.295^{+0.021}_{-0.038}$    |
| $c_{100}$                   | 0.99748  | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | 1.04102  | $1.04097^{+0.00092}_{-0.00093}$ | $f_{2000}^{143}$            | 30.8     | $31^{+6}_{-6}$               |
| $c_{217}$                   | 1.00139  | $1.0013^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.878   | $13.871^{+0.090}_{-0.093}$      | $f_{2000}^{217}$            | 107.44   | $108.0^{+4.3}_{-4.2}$        |
| $H_0$                       | 67.47    | $65.7^{+3.4}_{-4.7}$            | $z_{drag}$                  | 1059.44  | $1059.29^{+0.95}_{-0.96}$       | $f_{2000}^{143 \times 217}$ | 32.87    | $34^{+5}_{-4}$               |
| $\Omega_\Lambda$            | 0.687    | $0.662^{+0.047}_{-0.067}$       | $r_{drag}$                  | 147.22   | $147.15^{+0.96}_{-0.99}$        | $\chi_{small}^2$            | 395.71   | $397.0 (\nu: 1.6)$           |
| $\Omega_m$                  | 0.313    | $0.338^{+0.067}_{-0.047}$       | $k_D$                       | 0.14056  | $0.1406^{+0.0010}_{-0.0010}$    | $\chi_{lowl}^2$             | 23.54    | $23.6 (\nu: 0.8)$            |
| $\Omega_m h^2$              | 0.1427   | $0.1450^{+0.0069}_{-0.0057}$    | $100\theta_D$               | 0.16105  | $0.16112^{+0.00055}_{-0.00054}$ | $\chi_{CamSpec}^2$          | 7049.7   | $7064.5 (\nu: 16.3)$         |
| $\Omega_\nu h^2$            | 0.00001  | $< 0.00611$                     | $z_{eq}$                    | 3409     | $3418^{+100}_{-96}$             | $\chi_{prior}^2$            | 2.3      | $7.7 (\nu: 6.1)$             |
| $\Omega_m h^3$              | 0.09626  | $0.0952^{+0.0019}_{-0.0028}$    | $k_{eq}$                    | 0.010405 | $0.01043^{+0.00031}_{-0.00029}$ | $\chi_{CMB}^2$              | 7469.0   | $7485.1 (\nu: 16.9)$         |
| $\sigma_8$                  | 0.823    | $0.787^{+0.051}_{-0.085}$       | $100\theta_{eq}$            | 0.8113   | $0.810^{+0.018}_{-0.018}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7471.23$ ;  $\Delta\chi_{eff}^2 = -0.51$ ;  $\bar{\chi}_{eff}^2 = 7492.77$ ;  $\Delta\bar{\chi}_{eff}^2 = 1.23$ ;  $R - 1 = 0.00611$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.71 ( $\Delta$  -0.12) commander\_dx12\_v3\_2\_29: 23.54 ( $\Delta$  0.14) CamSpec like\_10.7HM: 7049.70 ( $\Delta$  -0.64)



## 5.2 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02206^{+0.00048}_{-0.00052}$ | $S_8$                       | $0.833^{+0.049}_{-0.050}$       | $100\theta_{s,eq}$          | $0.4479^{+0.0093}_{-0.0092}$ |
| $\Omega_c h^2$              | $0.1209^{+0.0045}_{-0.0043}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.456^{+0.027}_{-0.027}$       | $H(0.15)$                   | $71.3^{+3.0}_{-4.0}$         |
| $100\theta_{MC}$            | $1.04071^{+0.00098}_{-0.0010}$  | $\sigma_8 \Omega_m^{0.25}$  | $0.599^{+0.036}_{-0.045}$       | $D_M(0.15)$                 | $658^{+44}_{-31}$            |
| $\tau$                      | $0.053^{+0.013}_{-0.011}$       | $\sigma_8/h^{0.5}$          | $0.972^{+0.058}_{-0.079}$       | $H(0.38)$                   | $81.8^{+2.2}_{-3.1}$         |
| $\Sigma m_\nu$ [eV]         | $< 0.572$                       | $r_{drag} h$                | $96.7^{+5.5}_{-7.3}$            | $D_M(0.38)$                 | $1564^{+87}_{-61}$           |
| $\ln(10^{10} A_s)$          | $3.042^{+0.029}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$ | $2.446^{+0.074}_{-0.074}$       | $H(0.51)$                   | $88.7^{+1.8}_{-2.5}$         |
| $n_s$                       | $0.962^{+0.012}_{-0.013}$       | $z_{re}$                    | $< 8.91$                        | $D_M(0.51)$                 | $2022^{+100}_{-72}$          |
| $y_{cal}$                   | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.095^{+0.061}_{-0.054}$       | $H(0.61)$                   | $94.5^{+1.5}_{-2.1}$         |
| $A_{100}^{PS}$              | $244^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.882^{+0.027}_{-0.027}$       | $D_M(0.61)$                 | $2349^{+110}_{-78}$          |
| $A_{143}^{PS}$              | $42^{+20}_{-20}$                | $D_{40}$                    | $1230^{+30}_{-29}$              | $H(2.33)$                   | $237.5^{+4.0}_{-3.5}$        |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{220}$                   | $5701^{+81}_{-83}$              | $D_M(2.33)$                 | $5806^{+110}_{-74}$          |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{810}$                   | $2535^{+27}_{-28}$              | $f\sigma_8(0.15)$           | $0.460^{+0.025}_{-0.027}$    |
| $A_{143}^{tSZ}$             | $< 7.27$                        | $D_{1420}$                  | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.726^{+0.048}_{-0.082}$    |
| $r_{143 \times 217}^{PS}$   | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | $229.2^{+3.8}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.473^{+0.027}_{-0.031}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $n_{s,0.002}$               | $0.962^{+0.012}_{-0.013}$       | $\sigma_8(0.38)$            | $0.642^{+0.043}_{-0.077}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P$                       | $0.24526^{+0.00021}_{-0.00023}$ | $f\sigma_8(0.51)$           | $0.469^{+0.027}_{-0.035}$    |
| $A^{kSZ}$                   | —                               | $Y_P^{BBN}$                 | $0.24659^{+0.00021}_{-0.00023}$ | $\sigma_8(0.51)$            | $0.600^{+0.041}_{-0.073}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.37}$          | $10^5 D/H$                  | $2.64^{+0.10}_{-0.090}$         | $f\sigma_8(0.61)$           | $0.462^{+0.027}_{-0.037}$    |
| $A_{143}^{dust}$            | $0.98^{+0.34}_{-0.35}$          | Age/Gyr                     | $13.90^{+0.25}_{-0.17}$         | $\sigma_8(0.61)$            | $0.570^{+0.039}_{-0.071}$    |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | $1090.42^{+0.99}_{-0.95}$       | $f\sigma_8(2.33)$           | $0.288^{+0.018}_{-0.033}$    |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.31}$          | $r_*$                       | $144.40^{+0.96}_{-1.0}$         | $\sigma_8(2.33)$            | $0.295^{+0.021}_{-0.038}$    |
| $c_{100}$                   | $0.9974^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04098^{+0.00092}_{-0.00093}$ | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $c_{217}$                   | $1.0013^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.872^{+0.090}_{-0.093}$      | $f_{2000}^{217}$            | $108.0^{+4.3}_{-4.2}$        |
| $H_0$                       | $65.7^{+3.4}_{-4.7}$            | $z_{drag}$                  | $1059.30^{+0.98}_{-0.97}$       | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-4}$               |
| $\Omega_\Lambda$            | $0.663^{+0.047}_{-0.068}$       | $r_{drag}$                  | $147.17^{+0.96}_{-0.98}$        | $\chi_{simall}^2$           | $396.9 (\nu: 1.6)$           |
| $\Omega_m$                  | $0.337^{+0.068}_{-0.047}$       | $k_D$                       | $0.1406^{+0.0010}_{-0.0010}$    | $\chi_{lowl}^2$             | $23.6 (\nu: 0.8)$            |
| $\Omega_m h^2$              | $0.1449^{+0.0069}_{-0.0058}$    | $100\theta_D$               | $0.16112^{+0.00055}_{-0.00054}$ | $\chi_{CamSpec}^2$          | $7064.4 (\nu: 16.1)$         |
| $\Omega_\nu h^2$            | $< 0.00615$                     | $z_{eq}$                    | $3416^{+99}_{-95}$              | $\chi_{prior}^2$            | $7.7 (\nu: 6.1)$             |
| $\Omega_m h^3$              | $0.0952^{+0.0019}_{-0.0029}$    | $k_{eq}$                    | $0.01043^{+0.00031}_{-0.00029}$ | $\chi_{CMB}^2$              | $7484.8 (\nu: 16.4)$         |
| $\sigma_8$                  | $0.788^{+0.051}_{-0.085}$       | $100\theta_{eq}$            | $0.810^{+0.018}_{-0.018}$       |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7492.51; \Delta\bar{\chi}_{\text{eff}}^2 = 1.25; R - 1 = 0.00841$$



### 5.3 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022312 | $0.02227^{+0.00034}_{-0.00033}$ | $\sigma_8$                  | 0.8205   | $0.795^{+0.039}_{-0.058}$       | $100\theta_{s,eq}$          | 0.4505   | $0.4502^{+0.0061}_{-0.0059}$ |
| $\Omega_c h^2$              | 0.11951  | $0.1197^{+0.0027}_{-0.0028}$    | $S_8$                       | 0.8298   | $0.822^{+0.034}_{-0.036}$       | $H(0.15)$                   | 73.22    | $72.2^{+2.0}_{-2.6}$         |
| $100\theta_{MC}$            | 1.04093  | $1.04082^{+0.00064}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4545   | $0.450^{+0.019}_{-0.020}$       | $D_M(0.15)$                 | 638.0    | $649^{+27}_{-20}$            |
| $\tau$                      | 0.0522   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6107   | $0.598^{+0.026}_{-0.031}$       | $H(0.38)$                   | 83.26    | $82.4^{+1.5}_{-2.0}$         |
| $\Sigma m_\nu$ [eV]         | 0.001    | $< 0.379$                       | $\sigma_8/h^{0.5}$          | 0.9951   | $0.972^{+0.042}_{-0.055}$       | $D_M(0.38)$                 | 1522.7   | $1544^{+55}_{-41}$           |
| $\ln(10^{10} A_s)$          | 3.0374   | $3.039^{+0.032}_{-0.031}$       | $r_{drag} h$                | 100.14   | $98.4^{+3.7}_{-4.6}$            | $H(0.51)$                   | 89.94    | $89.2^{+1.3}_{-1.7}$         |
| $n_s$                       | 0.9667   | $0.9652^{+0.0091}_{-0.0091}$    | $\langle d^2 \rangle^{1/2}$ | 2.439    | $2.428^{+0.057}_{-0.057}$       | $D_M(0.51)$                 | 1973     | $1999^{+65}_{-48}$           |
| $y_{cal}$                   | 1.00034  | $1.0006^{+0.0047}_{-0.0048}$    | $z_{re}$                    | 7.46     | $7.5^{+1.5}_{-1.7}$             | $H(0.61)$                   | 95.53    | $94.9^{+1.0}_{-1.4}$         |
| $A_{100}^{PS}$              | 231.3    | $241^{+50}_{-50}$               | $10^9 A_s$                  | 2.085    | $2.088^{+0.068}_{-0.065}$       | $D_M(0.61)$                 | 2297     | $2325^{+70}_{-52}$           |
| $A_{143}^{PS}$              | 45.8     | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8786   | $1.879^{+0.022}_{-0.022}$       | $H(2.33)$                   | 235.85   | $236.6^{+2.4}_{-2.2}$        |
| $A_{217}^{PS}$              | 103.5    | $102^{+30}_{-30}$               | $D_{40}$                    | 1224.5   | $1227^{+25}_{-26}$              | $D_M(2.33)$                 | 5753     | $5782^{+71}_{-51}$           |
| $A_{217}^{CIB}$             | 43.3     | $40^{+10}_{-10}$                | $D_{220}$                   | 5717     | $5720^{+73}_{-75}$              | $f\sigma_8(0.15)$           | 0.4587   | $0.455^{+0.017}_{-0.019}$    |
| $A_{143}^{tSZ}$             | 6.55     | $< 7.47$                        | $D_{810}$                   | 2535.3   | $2536^{+25}_{-26}$              | $\sigma_8(0.15)$            | 0.7585   | $0.733^{+0.037}_{-0.056}$    |
| $r_{143 \times 217}^{PS}$   | 0.674    | $0.65^{+0.25}_{-0.25}$          | $D_{1420}$                  | 816.0    | $815.7^{+9.2}_{-9.5}$           | $f\sigma_8(0.38)$           | 0.4782   | $0.471^{+0.019}_{-0.021}$    |
| $r_{143 \times 217}^{CIB}$  | 0.85     | —                               | $D_{2000}$                  | 230.50   | $230.1^{+3.2}_{-3.3}$           | $\sigma_8(0.38)$            | 0.6727   | $0.649^{+0.033}_{-0.052}$    |
| $\xi^{tSZ \times CIB}$      | 0.49     | —                               | $n_{s,0.002}$               | 0.9667   | $0.9652^{+0.0091}_{-0.0091}$    | $f\sigma_8(0.51)$           | 0.4772   | $0.468^{+0.019}_{-0.023}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P$                       | 0.245372 | $0.24535^{+0.00013}_{-0.00015}$ | $\sigma_8(0.51)$            | 0.6296   | $0.607^{+0.032}_{-0.050}$    |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246698 | $0.24668^{+0.00013}_{-0.00015}$ | $f\sigma_8(0.61)$           | 0.4725   | $0.463^{+0.019}_{-0.025}$    |
| $A_{143}^{dust}$            | 0.981    | $0.97^{+0.34}_{-0.35}$          | $10^5 D/H$                  | 2.597    | $2.606^{+0.064}_{-0.062}$       | $\sigma_8(0.61)$            | 0.5991   | $0.578^{+0.030}_{-0.048}$    |
| $A_{217}^{dust}$            | 0.976    | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | 13.773   | $13.84^{+0.16}_{-0.12}$         | $f\sigma_8(2.33)$           | 0.3013   | $0.292^{+0.014}_{-0.022}$    |
| $A_{143 \times 217}^{dust}$ | 1.005    | $1.03^{+0.31}_{-0.31}$          | $z_*$                       | 1089.95  | $1090.04^{+0.64}_{-0.59}$       | $\sigma_8(2.33)$            | 0.3113   | $0.300^{+0.016}_{-0.026}$    |
| $c_{100}$                   | 0.99774  | $0.9975^{+0.0021}_{-0.0020}$    | $r_*$                       | 144.61   | $144.57^{+0.63}_{-0.62}$        | $f_{2000}^{143}$            | 29.8     | $30^{+6}_{-6}$               |
| $c_{217}$                   | 1.00133  | $1.0011^{+0.0030}_{-0.0031}$    | $100\theta_*$               | 1.04108  | $1.04105^{+0.00061}_{-0.00062}$ | $f_{2000}^{217}$            | 106.52   | $107.2^{+3.9}_{-3.9}$        |
| $c_{TE}$                    | 0.9964   | $0.9971^{+0.0098}_{-0.0095}$    | $D_M(z_*)/\text{Gpc}$       | 13.890   | $13.887^{+0.059}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | 31.94    | $32^{+4}_{-4}$               |
| $c_{EE}$                    | 0.9923   | $0.9924^{+0.0096}_{-0.0095}$    | $z_{drag}$                  | 1059.78  | $1059.68^{+0.67}_{-0.66}$       | $\chi_{small}^2$            | 395.78   | $396.9 (\nu: 1.5)$           |
| $H_0$                       | 67.99    | $66.8^{+2.3}_{-3.0}$            | $r_{drag}$                  | 147.29   | $147.27^{+0.62}_{-0.61}$        | $\chi_{lowl}^2$             | 23.03    | $23.13 (\nu: 0.4)$           |
| $\Omega_\Lambda$            | 0.6931   | $0.678^{+0.030}_{-0.040}$       | $k_D$                       | 0.14061  | $0.14061^{+0.00069}_{-0.00068}$ | $\chi_{CamSpec}^2$          | 11499.2  | $11515.5 (\nu: 18.2)$        |
| $\Omega_m$                  | 0.3069   | $0.322^{+0.040}_{-0.030}$       | $100\theta_D$               | 0.160856 | $0.16089^{+0.00038}_{-0.00039}$ | $\chi_{prior}^2$            | 2.1      | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^2$              | 0.14183  | $0.1434^{+0.0043}_{-0.0037}$    | $z_{eq}$                    | 3389     | $3393^{+62}_{-62}$              | $\chi_{CMB}^2$              | 11918.0  | $11935.6 (\nu: 18.8)$        |
| $\Omega_\nu h^2$            | 0.00001  | $< 0.00407$                     | $k_{eq}$                    | 0.010344 | $0.01036^{+0.00019}_{-0.00019}$ |                             |          |                              |
| $\Omega_m h^3$              | 0.09642  | $0.0957^{+0.0013}_{-0.0018}$    | $100\theta_{eq}$            | 0.8154   | $0.815^{+0.012}_{-0.011}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11920.07$ ;  $\Delta\chi_{eff}^2 = -0.70$ ;  $\bar{\chi}_{eff}^2 = 11943.39$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.93$ ;  $R - 1 = 0.01661$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.78 ( $\Delta$  -0.12) commander\_dx12.v3.2.29: 23.03 ( $\Delta$  0.03) CamSpec like\_10.7HM\_1400\_unified: 11499.19 ( $\Delta$  -0.46)



#### 5.4 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02243^{+0.00033}_{-0.00030}$ | $\sigma_8$                  | $0.810^{+0.019}_{-0.023}$       | $100\theta_{s,eq}$          | $0.4539^{+0.0052}_{-0.0057}$ |
| $\Omega_c h^2$              | $0.1180^{+0.0026}_{-0.0023}$    | $S_8$                       | $0.811^{+0.031}_{-0.032}$       | $H(0.15)$                   | $73.6^{+1.1}_{-1.2}$         |
| $100\theta_{MC}$            | $1.04110^{+0.00066}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.444^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | $634^{+12}_{-11}$            |
| $\tau$                      | $0.055^{+0.015}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.600^{+0.017}_{-0.018}$       | $H(0.38)$                   | $83.52^{+0.81}_{-0.89}$      |
| $\Sigma m_\nu$ [eV]         | $< 0.108$                       | $\sigma_8/h^{0.5}$          | $0.979^{+0.025}_{-0.027}$       | $D_M(0.38)$                 | $1516^{+23}_{-22}$           |
| $\ln(10^{10} A_s)$          | $3.040^{+0.033}_{-0.032}$       | $r_{drag} h$                | $101.0^{+2.1}_{-2.2}$           | $H(0.51)$                   | $90.13^{+0.66}_{-0.73}$      |
| $n_s$                       | $0.9697^{+0.0083}_{-0.0088}$    | $\langle d^2 \rangle^{1/2}$ | $2.414^{+0.054}_{-0.051}$       | $D_M(0.51)$                 | $1965^{+28}_{-25}$           |
| $y_{cal}$                   | $1.0007^{+0.0050}_{-0.0047}$    | $z_{re}$                    | $7.7^{+1.6}_{-1.6}$             | $H(0.61)$                   | $95.67^{+0.58}_{-0.61}$      |
| $A_{100}^{PS}$              | $239^{+40}_{-50}$               | $10^9 A_s$                  | $2.091^{+0.069}_{-0.066}$       | $D_M(0.61)$                 | $2288^{+30}_{-27}$           |
| $A_{143}^{PS}$              | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.022}_{-0.020}$       | $H(2.33)$                   | $235.2^{+1.6}_{-1.5}$        |
| $A_{217}^{PS}$              | $102^{+30}_{-20}$               | $D_{40}$                    | $1220^{+24}_{-24}$              | $D_M(2.33)$                 | $5747^{+29}_{-26}$           |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{220}$                   | $5730^{+79}_{-77}$              | $f\sigma_8(0.15)$           | $0.450^{+0.016}_{-0.017}$    |
| $A_{143}^{tSZ}$             | $< 7.41$                        | $D_{810}$                   | $2535^{+29}_{-25}$              | $\sigma_8(0.15)$            | $0.750^{+0.018}_{-0.022}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.26}_{-0.27}$          | $D_{1420}$                  | $817.0^{+9.8}_{-9.6}$           | $f\sigma_8(0.38)$           | $0.470^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.9^{+3.5}_{-3.3}$           | $\sigma_8(0.38)$            | $0.666^{+0.016}_{-0.018}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9697^{+0.0083}_{-0.0088}$    | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24542^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.623^{+0.015}_{-0.017}$    |
| $A_{100}^{dust}$            | $1.01^{+0.36}_{-0.37}$          | $Y_P^{BBN}$                 | $0.24674^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.012}$    |
| $A_{143}^{dust}$            | $0.97^{+0.34}_{-0.35}$          | $10^5 D/H$                  | $2.575^{+0.056}_{-0.060}$       | $\sigma_8(0.61)$            | $0.593^{+0.014}_{-0.016}$    |
| $A_{217}^{dust}$            | $0.98^{+0.21}_{-0.19}$          | Age/Gyr                     | $13.763^{+0.065}_{-0.057}$      | $f\sigma_8(2.33)$           | $0.2993^{+0.0068}_{-0.0075}$ |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.31}_{-0.29}$          | $z_*$                       | $1089.67^{+0.52}_{-0.53}$       | $\sigma_8(2.33)$            | $0.3092^{+0.0075}_{-0.0087}$ |
| $c_{100}$                   | $0.9976^{+0.0020}_{-0.0020}$    | $r_*$                       | $144.91^{+0.56}_{-0.57}$        | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{217}$                   | $1.0011^{+0.0029}_{-0.0031}$    | $100\theta_*$               | $1.04127^{+0.00071}_{-0.00061}$ | $f_{2000}^{217}$            | $106.5^{+3.7}_{-3.9}$        |
| $c_{TE}$                    | $0.9966^{+0.0099}_{-0.0096}$    | $D_M(z_*)/\text{Gpc}$       | $13.917^{+0.052}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{EE}$                    | $0.9923^{+0.0097}_{-0.0093}$    | $z_{drag}$                  | $1059.93^{+0.65}_{-0.64}$       | $\chi_{simall}^2$           | $397.1 (\nu: 1.6)$           |
| $H_0$                       | $68.4^{+1.3}_{-1.4}$            | $r_{drag}$                  | $147.57^{+0.57}_{-0.59}$        | $\chi_{lowl}^2$             | $22.56 (\nu: 0.4)$           |
| $\Omega_\Lambda$            | $0.699^{+0.015}_{-0.017}$       | $k_D$                       | $0.14041^{+0.00068}_{-0.00066}$ | $\chi_{CamSpec}^2$          | $11516.2 (\nu: 17.8)$        |
| $\Omega_m$                  | $0.301^{+0.017}_{-0.015}$       | $100\theta_D$               | $0.16077^{+0.00037}_{-0.00038}$ | $\chi_{H073p45}^2$          | $9.3 (\nu: 3.1)$             |
| $\Omega_m h^2$              | $0.1408^{+0.0026}_{-0.0024}$    | $z_{eq}$                    | $3355^{+58}_{-55}$              | $\chi_{prior}^2$            | $7.5 (\nu: 5.3)$             |
| $\Omega_\nu h^2$            | $< 0.00116$                     | $k_{eq}$                    | $0.01024^{+0.00018}_{-0.00017}$ | $\chi_{CMB}^2$              | $11935.8 (\nu: 18.2)$        |
| $\Omega_m h^3$              | $0.09635^{+0.00073}_{-0.00077}$ | $100\theta_{eq}$            | $0.822^{+0.010}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{eff}^2 = 11952.66; \Delta\bar{\chi}_{eff}^2 = -1.61; R - 1 = 0.05737$$



## 5.5 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02227^{+0.00034}_{-0.00033}$ | $\sigma_8$                  | $0.795^{+0.038}_{-0.058}$       | $100\theta_{s,eq}$          | $0.4503^{+0.0061}_{-0.0058}$ |
| $\Omega_c h^2$              | $0.1197^{+0.0027}_{-0.0028}$    | $S_8$                       | $0.823^{+0.034}_{-0.035}$       | $H(0.15)$                   | $72.2^{+2.0}_{-2.6}$         |
| $100\theta_{MC}$            | $1.04083^{+0.00064}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.018}_{-0.019}$       | $D_M(0.15)$                 | $649^{+27}_{-20}$            |
| $\tau$                      | $0.054^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.599^{+0.026}_{-0.031}$       | $H(0.38)$                   | $82.4^{+1.5}_{-2.0}$         |
| $\Sigma m_\nu$ [eV]         | $< 0.382$                       | $\sigma_8/h^{0.5}$          | $0.973^{+0.042}_{-0.055}$       | $D_M(0.38)$                 | $1544^{+55}_{-41}$           |
| $\ln(10^{10} A_s)$          | $3.042^{+0.028}_{-0.026}$       | $r_{drag} h$                | $98.4^{+3.7}_{-4.7}$            | $H(0.51)$                   | $89.3^{+1.3}_{-1.7}$         |
| $n_s$                       | $0.9654^{+0.0091}_{-0.0090}$    | $\langle d^2 \rangle^{1/2}$ | $2.431^{+0.055}_{-0.055}$       | $D_M(0.51)$                 | $1999^{+65}_{-48}$           |
| $y_{cal}$                   | $1.0006^{+0.0047}_{-0.0048}$    | $z_{re}$                    | $< 8.87$                        | $H(0.61)$                   | $94.9^{+1.1}_{-1.4}$         |
| $A_{100}^{PS}$              | $241^{+50}_{-50}$               | $10^9 A_s$                  | $2.094^{+0.058}_{-0.054}$       | $D_M(0.61)$                 | $2324^{+70}_{-52}$           |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.022}_{-0.022}$       | $H(2.33)$                   | $236.6^{+2.4}_{-2.2}$        |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1227^{+25}_{-26}$              | $D_M(2.33)$                 | $5782^{+71}_{-51}$           |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{220}$                   | $5719^{+74}_{-75}$              | $f\sigma_8(0.15)$           | $0.455^{+0.017}_{-0.019}$    |
| $A_{143}^{tSZ}$             | $< 7.47$                        | $D_{810}$                   | $2535^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.734^{+0.036}_{-0.056}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $815.7^{+9.2}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.471^{+0.019}_{-0.021}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.1^{+3.2}_{-3.3}$           | $\sigma_8(0.38)$            | $0.650^{+0.033}_{-0.053}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9654^{+0.0091}_{-0.0090}$    | $f\sigma_8(0.51)$           | $0.469^{+0.019}_{-0.023}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24535^{+0.00013}_{-0.00014}$ | $\sigma_8(0.51)$            | $0.608^{+0.031}_{-0.050}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | $0.24668^{+0.00013}_{-0.00015}$ | $f\sigma_8(0.61)$           | $0.463^{+0.019}_{-0.025}$    |
| $A_{143}^{dust}$            | $0.97^{+0.34}_{-0.35}$          | $10^5 D/H$                  | $2.605^{+0.064}_{-0.061}$       | $\sigma_8(0.61)$            | $0.578^{+0.030}_{-0.048}$    |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | $13.84^{+0.16}_{-0.12}$         | $f\sigma_8(2.33)$           | $0.292^{+0.014}_{-0.022}$    |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.31}_{-0.31}$          | $z_*$                       | $1090.03^{+0.64}_{-0.59}$       | $\sigma_8(2.33)$            | $0.300^{+0.016}_{-0.026}$    |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0020}$    | $r_*$                       | $144.58^{+0.63}_{-0.60}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{217}$                   | $1.0011^{+0.0030}_{-0.0031}$    | $100\theta_*$               | $1.04106^{+0.00061}_{-0.00062}$ | $f_{2000}^{217}$            | $107.1^{+3.8}_{-3.9}$        |
| $c_{TE}$                    | $0.9970^{+0.0098}_{-0.0095}$    | $D_M(z_*)/\text{Gpc}$       | $13.888^{+0.058}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{EE}$                    | $0.9923^{+0.0096}_{-0.0095}$    | $z_{drag}$                  | $1059.69^{+0.67}_{-0.67}$       | $\chi_{simall}^2$           | $396.9 (\nu: 1.5)$           |
| $H_0$                       | $66.8^{+2.3}_{-3.0}$            | $r_{drag}$                  | $147.28^{+0.62}_{-0.60}$        | $\chi_{lowl}^2$             | $23.14 (\nu: 0.4)$           |
| $\Omega_\Lambda$            | $0.678^{+0.030}_{-0.040}$       | $k_D$                       | $0.14060^{+0.00068}_{-0.00068}$ | $\chi_{CamSpec}^2$          | $11515.4 (\nu: 18.0)$        |
| $\Omega_m$                  | $0.322^{+0.040}_{-0.030}$       | $100\theta_D$               | $0.16089^{+0.00038}_{-0.00039}$ | $\chi_{prior}^2$            | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^2$              | $0.1433^{+0.0043}_{-0.0037}$    | $z_{eq}$                    | $3392^{+61}_{-62}$              | $\chi_{CMB}^2$              | $11935.4 (\nu: 18.3)$        |
| $\Omega_\nu h^2$            | $< 0.00410$                     | $k_{eq}$                    | $0.01035^{+0.00019}_{-0.00019}$ |                             |                              |
| $\Omega_m h^3$              | $0.0957^{+0.0013}_{-0.0018}$    | $100\theta_{eq}$            | $0.815^{+0.012}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{eff}^2 = 11943.12; \Delta\bar{\chi}_{eff}^2 = 0.93; R - 1 = 0.01799$$



## 5.6 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02243^{+0.00034}_{-0.00030}$ | $\sigma_8$                  | $0.811^{+0.019}_{-0.023}$       | $100\theta_{s,eq}$          | $0.4540^{+0.0054}_{-0.0055}$ |
| $\Omega_c h^2$              | $0.1180^{+0.0026}_{-0.0024}$    | $S_8$                       | $0.812^{+0.030}_{-0.030}$       | $H(0.15)$                   | $73.6^{+1.1}_{-1.2}$         |
| $100\theta_{MC}$            | $1.04111^{+0.00066}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.445^{+0.017}_{-0.016}$       | $D_M(0.15)$                 | $634^{+12}_{-11}$            |
| $\tau$                      | $0.056^{+0.014}_{-0.012}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.600^{+0.017}_{-0.016}$       | $H(0.38)$                   | $83.53^{+0.87}_{-0.88}$      |
| $\Sigma m_\nu$ [eV]         | $< 0.108$                       | $\sigma_8/h^{0.5}$          | $0.980^{+0.025}_{-0.025}$       | $D_M(0.38)$                 | $1515^{+23}_{-21}$           |
| $\ln(10^{10} A_s)$          | $3.042^{+0.029}_{-0.027}$       | $r_{drag} h$                | $101.0^{+2.2}_{-2.2}$           | $H(0.51)$                   | $90.14^{+0.70}_{-0.72}$      |
| $n_s$                       | $0.9698^{+0.0082}_{-0.0088}$    | $\langle d^2 \rangle^{1/2}$ | $2.416^{+0.052}_{-0.050}$       | $D_M(0.51)$                 | $1965^{+27}_{-26}$           |
| $y_{cal}$                   | $1.0007^{+0.0050}_{-0.0047}$    | $z_{re}$                    | $< 9.00$                        | $H(0.61)$                   | $95.68^{+0.58}_{-0.61}$      |
| $A_{100}^{PS}$              | $239^{+50}_{-50}$               | $10^9 A_s$                  | $2.095^{+0.062}_{-0.057}$       | $D_M(0.61)$                 | $2288^{+30}_{-28}$           |
| $A_{143}^{PS}$              | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.022}_{-0.020}$       | $H(2.33)$                   | $235.2^{+1.6}_{-1.5}$        |
| $A_{217}^{PS}$              | $102^{+30}_{-20}$               | $D_{40}$                    | $1220^{+25}_{-24}$              | $D_M(2.33)$                 | $5747^{+29}_{-29}$           |
| $A_{217}^{CIB}$             | $39^{+10}_{-10}$                | $D_{220}$                   | $5730^{+79}_{-77}$              | $f\sigma_8(0.15)$           | $0.450^{+0.016}_{-0.015}$    |
| $A_{143}^{tSZ}$             | $< 7.43$                        | $D_{810}$                   | $2535^{+29}_{-26}$              | $\sigma_8(0.15)$            | $0.750^{+0.018}_{-0.021}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.26}_{-0.26}$          | $D_{1420}$                  | $816.9^{+9.9}_{-9.6}$           | $f\sigma_8(0.38)$           | $0.471^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.9^{+3.5}_{-3.3}$           | $\sigma_8(0.38)$            | $0.666^{+0.016}_{-0.017}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9698^{+0.0082}_{-0.0088}$    | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24542^{+0.00013}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.624^{+0.015}_{-0.017}$    |
| $A_{100}^{dust}$            | $1.02^{+0.35}_{-0.38}$          | $Y_P^{BBN}$                 | $0.24674^{+0.00013}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $A_{143}^{dust}$            | $0.97^{+0.34}_{-0.35}$          | $10^5 D/H$                  | $2.574^{+0.057}_{-0.062}$       | $\sigma_8(0.61)$            | $0.594^{+0.014}_{-0.016}$    |
| $A_{217}^{dust}$            | $0.98^{+0.21}_{-0.19}$          | Age/Gyr                     | $13.762^{+0.066}_{-0.067}$      | $f\sigma_8(2.33)$           | $0.2996^{+0.0060}_{-0.0078}$ |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.31}_{-0.29}$          | $z_*$                       | $1089.66^{+0.52}_{-0.52}$       | $\sigma_8(2.33)$            | $0.3095^{+0.0072}_{-0.0085}$ |
| $c_{100}$                   | $0.9976^{+0.0020}_{-0.0020}$    | $r_*$                       | $144.92^{+0.56}_{-0.57}$        | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{217}$                   | $1.0011^{+0.0028}_{-0.0030}$    | $100\theta_*$               | $1.04128^{+0.00072}_{-0.00061}$ | $f_{2000}^{217}$            | $106.5^{+3.6}_{-3.8}$        |
| $c_{TE}$                    | $0.9966^{+0.010}_{-0.0096}$     | $D_M(z_*)/\text{Gpc}$       | $13.917^{+0.052}_{-0.055}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{EE}$                    | $0.9923^{+0.0098}_{-0.0094}$    | $z_{drag}$                  | $1059.93^{+0.65}_{-0.65}$       | $\chi_{simall}^2$           | $397.0 (\nu: 1.6)$           |
| $H_0$                       | $68.4^{+1.3}_{-1.4}$            | $r_{drag}$                  | $147.57^{+0.55}_{-0.60}$        | $\chi_{lowl}^2$             | $22.57 (\nu: 0.4)$           |
| $\Omega_\Lambda$            | $0.699^{+0.016}_{-0.017}$       | $k_D$                       | $0.14041^{+0.00068}_{-0.00066}$ | $\chi_{CamSpec}^2$          | $11516.1 (\nu: 17.9)$        |
| $\Omega_m$                  | $0.301^{+0.017}_{-0.016}$       | $100\theta_D$               | $0.16077^{+0.00037}_{-0.00037}$ | $\chi_{H073p45}^2$          | $9.3 (\nu: 3.1)$             |
| $\Omega_m h^2$              | $0.1408^{+0.0025}_{-0.0023}$    | $z_{eq}$                    | $3355^{+58}_{-55}$              | $\chi_{prior}^2$            | $7.5 (\nu: 5.2)$             |
| $\Omega_\nu h^2$            | $< 0.00116$                     | $k_{eq}$                    | $0.01024^{+0.00018}_{-0.00017}$ | $\chi_{CMB}^2$              | $11935.7 (\nu: 18.1)$        |
| $\Omega_m h^3$              | $0.09635^{+0.00072}_{-0.00076}$ | $100\theta_{eq}$            | $0.822^{+0.010}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{eff}^2 = 11952.44; \Delta\bar{\chi}_{eff}^2 = -1.57; R - 1 = 0.06967$$



## 5.7 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022343 | $0.02227^{+0.00032}_{-0.00031}$ | $\sigma_8$                  | 0.8210   | $0.802^{+0.028}_{-0.037}$       | $100\theta_{s,eq}$          | 0.4508   | $0.4499^{+0.0057}_{-0.0056}$ |
| $\Omega_c h^2$              | 0.11938  | $0.1199^{+0.0026}_{-0.0026}$    | $S_8$                       | 0.8292   | $0.827^{+0.026}_{-0.025}$       | $H(0.15)$                   | 73.29    | $72.3^{+1.7}_{-2.1}$         |
| $100\theta_{MC}$            | 1.04091  | $1.04083^{+0.00066}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4541   | $0.453^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | 637.4    | $647^{+21}_{-17}$            |
| $\tau$                      | 0.0532   | $0.054^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6106   | $0.603^{+0.017}_{-0.019}$       | $H(0.38)$                   | 83.31    | $82.6^{+1.3}_{-1.6}$         |
| $\Sigma m_\nu$ [eV]         | 0.000    | $< 0.273$                       | $\sigma_8/h^{0.5}$          | 0.9952   | $0.980^{+0.028}_{-0.033}$       | $D_M(0.38)$                 | 1521.5   | $1541^{+43}_{-35}$           |
| $\ln(10^{10} A_s)$          | 3.0396   | $3.042^{+0.032}_{-0.030}$       | $r_{drag} h$                | 100.24   | $98.6^{+3.2}_{-3.8}$            | $H(0.51)$                   | 89.98    | $89.4^{+1.1}_{-1.3}$         |
| $n_s$                       | 0.9673   | $0.9650^{+0.0087}_{-0.0084}$    | $\langle d^2 \rangle^{1/2}$ | 2.4383   | $2.437^{+0.044}_{-0.043}$       | $D_M(0.51)$                 | 1971.8   | $1995^{+51}_{-41}$           |
| $y_{cal}$                   | 1.00052  | $1.0006^{+0.0050}_{-0.0049}$    | $z_{re}$                    | 7.56     | $7.7^{+1.6}_{-1.6}$             | $H(0.61)$                   | 95.56    | $95.04^{+0.89}_{-1.1}$       |
| $A_{100}^{PS}$              | 232.8    | $241^{+50}_{-50}$               | $10^9 A_s$                  | 2.090    | $2.095^{+0.067}_{-0.062}$       | $D_M(0.61)$                 | 2295     | $2320^{+55}_{-45}$           |
| $A_{143}^{PS}$              | 42.3     | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8786   | $1.880^{+0.022}_{-0.021}$       | $H(2.33)$                   | 235.79   | $236.6^{+2.2}_{-2.0}$        |
| $A_{217}^{PS}$              | 103.7    | $103^{+30}_{-30}$               | $D_{40}$                    | 1223.7   | $1229^{+23}_{-24}$              | $D_M(2.33)$                 | 5751.0   | $5776^{+54}_{-43}$           |
| $A_{217}^{CIB}$             | 42.7     | $40^{+10}_{-10}$                | $D_{220}$                   | 5719     | $5721^{+74}_{-75}$              | $f\sigma_8(0.15)$           | 0.4585   | $0.458^{+0.013}_{-0.013}$    |
| $A_{143}^{tSZ}$             | 6.19     | $< 7.41$                        | $D_{810}$                   | 2536.0   | $2536^{+27}_{-26}$              | $\sigma_8(0.15)$            | 0.7591   | $0.740^{+0.027}_{-0.036}$    |
| $r_{143 \times 217}^{PS}$   | 0.665    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | 816.6    | $815.9^{+9.7}_{-9.4}$           | $f\sigma_8(0.38)$           | 0.4781   | $0.474^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | 0.75     | —                               | $D_{2000}$                  | 230.77   | $230.2^{+3.3}_{-3.2}$           | $\sigma_8(0.38)$            | 0.6733   | $0.656^{+0.025}_{-0.034}$    |
| $\xi^{tSZ \times CIB}$      | 0.36     | —                               | $n_{s,0.002}$               | 0.9673   | $0.9650^{+0.0087}_{-0.0084}$    | $f\sigma_8(0.51)$           | 0.4773   | $0.472^{+0.012}_{-0.014}$    |
| $A^{kSZ}$                   | 0.5      | —                               | $Y_P$                       | 0.245385 | $0.24535^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.6302   | $0.613^{+0.024}_{-0.033}$    |
| $A_{100}^{dust}$            | 1.009    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.246711 | $0.24668^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | 0.4726   | $0.466^{+0.013}_{-0.015}$    |
| $A_{143}^{dust}$            | 0.972    | $0.96^{+0.34}_{-0.34}$          | $10^5 D/H$                  | 2.590    | $2.604^{+0.060}_{-0.059}$       | $\sigma_8(0.61)$            | 0.5997   | $0.583^{+0.023}_{-0.032}$    |
| $A_{217}^{dust}$            | 0.973    | $0.97^{+0.21}_{-0.20}$          | Age/Gyr                     | 13.769   | $13.83^{+0.12}_{-0.097}$        | $f\sigma_8(2.33)$           | 0.3016   | $0.295^{+0.011}_{-0.015}$    |
| $A_{143 \times 217}^{dust}$ | 1.018    | $1.02^{+0.32}_{-0.32}$          | $z_*$                       | 1089.89  | $1090.04^{+0.59}_{-0.56}$       | $\sigma_8(2.33)$            | 0.3117   | $0.303^{+0.013}_{-0.017}$    |
| $c_{100}$                   | 0.99772  | $0.9976^{+0.0021}_{-0.0020}$    | $r_*$                       | 144.62   | $144.54^{+0.61}_{-0.61}$        | $f_{2000}^{143}$            | 29.3     | $30^{+6}_{-6}$               |
| $c_{217}$                   | 1.00120  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | 1.04107  | $1.04104^{+0.00063}_{-0.00060}$ | $f_{2000}^{217}$            | 106.32   | $107.0^{+3.8}_{-3.9}$        |
| $c_{TE}$                    | 0.9961   | $0.9968^{+0.0097}_{-0.0095}$    | $D_M(z_*)/\text{Gpc}$       | 13.891   | $13.884^{+0.057}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | 31.71    | $32^{+4}_{-4}$               |
| $c_{EE}$                    | 0.9917   | $0.9921^{+0.0097}_{-0.0097}$    | $z_{drag}$                  | 1059.82  | $1059.70^{+0.65}_{-0.65}$       | $\chi_{lensing}^2$          | 8.92     | $9.44 (\nu: 0.4)$            |
| $H_0$                       | 68.06    | $67.0^{+2.0}_{-2.4}$            | $r_{drag}$                  | 147.29   | $147.24^{+0.62}_{-0.60}$        | $\chi_{small}^2$            | 395.86   | $397.1 (\nu: 1.8)$           |
| $\Omega_\Lambda$            | 0.6940   | $0.680^{+0.026}_{-0.032}$       | $k_D$                       | 0.14063  | $0.14064^{+0.00067}_{-0.00070}$ | $\chi_{lowl}^2$             | 22.92    | $23.30 (\nu: 0.4)$           |
| $\Omega_m$                  | 0.3060   | $0.320^{+0.032}_{-0.026}$       | $100\theta_D$               | 0.160816 | $0.16089^{+0.00037}_{-0.00038}$ | $\chi_{CamSpec}^2$          | 11499.3  | $11514.7 (\nu: 15.9)$        |
| $\Omega_m h^2$              | 0.14172  | $0.1432^{+0.0038}_{-0.0034}$    | $z_{eq}$                    | 3387     | $3396^{+59}_{-59}$              | $\chi_{prior}^2$            | 2.1      | $7.8 (\nu: 6.0)$             |
| $\Omega_\nu h^2$            | 0.00000  | $< 0.00294$                     | $k_{eq}$                    | 0.010336 | $0.01037^{+0.00018}_{-0.00018}$ | $\chi_{CMB}^2$              | 11927.0  | $11944.5 (\nu: 18.0)$        |
| $\Omega_m h^3$              | 0.09645  | $0.0959^{+0.0011}_{-0.0013}$    | $100\theta_{eq}$            | 0.8159   | $0.814^{+0.011}_{-0.011}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11929.03$ ;  $\Delta\chi_{eff}^2 = -0.62$ ;  $\bar{\chi}_{eff}^2 = 11952.30$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.86$ ;  $R - 1 = 0.01307$   
 $\chi_{eff}^2$ : CMB - smicadx12.Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 8.92 ( $\Delta$  0.09) simall\_100x143\_offlike5\_EE\_Aplanck.B: 395.86 ( $\Delta$  -0.01) commander\_dx12.v3.2.29: 22.93 ( $\Delta$  -0.29) CamSpec like\_10.7HM\_1400\_unified: 11499.28 ( $\Delta$  -0.37)



## 5.8 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02228^{+0.00032}_{-0.00031}$ | $\sigma_8$                  | $0.802^{+0.028}_{-0.038}$       | $100\theta_{s,eq}$          | $0.4500^{+0.0057}_{-0.0056}$ |
| $\Omega_c h^2$              | $0.1198^{+0.0026}_{-0.0026}$    | $S_8$                       | $0.827^{+0.026}_{-0.025}$       | $H(0.15)$                   | $72.3^{+1.8}_{-2.2}$         |
| $100\theta_{MC}$            | $1.04083^{+0.00066}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $647^{+22}_{-18}$            |
| $\tau$                      | $0.055^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.017}_{-0.019}$       | $H(0.38)$                   | $82.6^{+1.3}_{-1.6}$         |
| $\Sigma m_\nu$ [eV]         | $< 0.278$                       | $\sigma_8/h^{0.5}$          | $0.980^{+0.028}_{-0.034}$       | $D_M(0.38)$                 | $1541^{+44}_{-35}$           |
| $\ln(10^{10} A_s)$          | $3.044^{+0.028}_{-0.026}$       | $r_{drag} h$                | $98.6^{+3.3}_{-3.9}$            | $H(0.51)$                   | $89.4^{+1.1}_{-1.3}$         |
| $n_s$                       | $0.9652^{+0.0086}_{-0.0084}$    | $\langle d^2 \rangle^{1/2}$ | $2.438^{+0.043}_{-0.042}$       | $D_M(0.51)$                 | $1995^{+52}_{-42}$           |
| $y_{cal}$                   | $1.0006^{+0.0050}_{-0.0049}$    | $z_{re}$                    | $< 8.99$                        | $H(0.61)$                   | $95.04^{+0.90}_{-1.1}$       |
| $A_{100}^{PS}$              | $241^{+50}_{-50}$               | $10^9 A_s$                  | $2.100^{+0.058}_{-0.053}$       | $D_M(0.61)$                 | $2320^{+57}_{-45}$           |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.880^{+0.022}_{-0.021}$       | $H(2.33)$                   | $236.6^{+2.3}_{-2.0}$        |
| $A_{217}^{PS}$              | $103^{+30}_{-30}$               | $D_{40}$                    | $1229^{+23}_{-24}$              | $D_M(2.33)$                 | $5776^{+55}_{-43}$           |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{220}$                   | $5721^{+74}_{-75}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{143}^{tSZ}$             | $< 7.42$                        | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.741^{+0.027}_{-0.037}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $815.9^{+9.7}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.474^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.2^{+3.3}_{-3.2}$           | $\sigma_8(0.38)$            | $0.656^{+0.025}_{-0.035}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9652^{+0.0086}_{-0.0084}$    | $f\sigma_8(0.51)$           | $0.472^{+0.012}_{-0.014}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.614^{+0.024}_{-0.034}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | $0.24668^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.467^{+0.013}_{-0.015}$    |
| $A_{143}^{dust}$            | $0.96^{+0.34}_{-0.34}$          | $10^5 D/H$                  | $2.604^{+0.060}_{-0.059}$       | $\sigma_8(0.61)$            | $0.584^{+0.023}_{-0.032}$    |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                     | $13.83^{+0.13}_{-0.098}$        | $f\sigma_8(2.33)$           | $0.295^{+0.011}_{-0.015}$    |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.31}$          | $z_*$                       | $1090.03^{+0.58}_{-0.55}$       | $\sigma_8(2.33)$            | $0.303^{+0.012}_{-0.018}$    |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0020}$    | $r_*$                       | $144.55^{+0.61}_{-0.61}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$               | $1.04105^{+0.00063}_{-0.00060}$ | $f_{2000}^{217}$            | $107.0^{+3.8}_{-3.9}$        |
| $c_{TE}$                    | $0.9968^{+0.0097}_{-0.0095}$    | $D_M(z_*)/\text{Gpc}$       | $13.885^{+0.057}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{EE}$                    | $0.9921^{+0.0096}_{-0.0097}$    | $z_{drag}$                  | $1059.71^{+0.68}_{-0.65}$       | $\chi_{lensing}^2$          | $9.39 (\nu: 0.3)$            |
| $H_0$                       | $67.0^{+2.0}_{-2.5}$            | $r_{drag}$                  | $147.25^{+0.62}_{-0.61}$        | $\chi_{simall}^2$           | $397.0 (\nu: 1.8)$           |
| $\Omega_\Lambda$            | $0.680^{+0.026}_{-0.033}$       | $k_D$                       | $0.14063^{+0.00067}_{-0.00069}$ | $\chi_{lowl}^2$             | $23.29 (\nu: 0.4)$           |
| $\Omega_m$                  | $0.320^{+0.033}_{-0.026}$       | $100\theta_D$               | $0.16088^{+0.00037}_{-0.00038}$ | $\chi_{CamSpec}^2$          | $11514.6 (\nu: 15.7)$        |
| $\Omega_m h^2$              | $0.1432^{+0.0039}_{-0.0034}$    | $z_{eq}$                    | $3395^{+59}_{-59}$              | $\chi_{prior}^2$            | $7.8 (\nu: 6.0)$             |
| $\Omega_\nu h^2$            | $< 0.00298$                     | $k_{eq}$                    | $0.01036^{+0.00018}_{-0.00018}$ | $\chi_{CMB}^2$              | $11944.4 (\nu: 17.7)$        |
| $\Omega_m h^3$              | $0.0959^{+0.0011}_{-0.0013}$    | $100\theta_{eq}$            | $0.814^{+0.011}_{-0.011}$       |                             |                              |

$$\bar{\chi}_{eff}^2 = 11952.13; \Delta\bar{\chi}_{eff}^2 = 0.88; R - 1 = 0.01210$$



## 5.9 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022216 | $0.02222^{+0.00038}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4545   | $0.450^{+0.019}_{-0.019}$       | $D_M(0.15)$                 | 638.1    | $641^{+10}_{-9.7}$           |
| $\Omega_c h^2$              | 0.11938  | $0.1189^{+0.0025}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6109   | $0.603^{+0.021}_{-0.024}$       | $H(0.38)$                   | 83.23    | $83.02^{+0.76}_{-0.78}$      |
| $100\theta_{MC}$            | 1.04101  | $1.04105^{+0.00082}_{-0.00082}$ | $\sigma_8/h^{0.5}$          | 0.9958   | $0.982^{+0.032}_{-0.037}$       | $D_M(0.38)$                 | 1523.1   | $1528^{+20}_{-20}$           |
| $\tau$                      | 0.0531   | $0.054^{+0.016}_{-0.015}$       | $r_{drag}h$                 | 100.22   | $99.9^{+1.9}_{-1.9}$            | $H(0.51)$                   | 89.90    | $89.71^{+0.64}_{-0.67}$      |
| $\Sigma m_\nu$ [eV]         | 0.003    | < 0.159                         | $\langle d^2 \rangle^{1/2}$ | 2.439    | $2.424^{+0.059}_{-0.063}$       | $D_M(0.51)$                 | 1973.8   | $1980^{+24}_{-23}$           |
| $\ln(10^{10} A_s)$          | 3.0387   | $3.038^{+0.033}_{-0.032}$       | $z_{re}$                    | 7.57     | $7.6^{+1.6}_{-1.6}$             | $H(0.61)$                   | 95.49    | $95.31^{+0.56}_{-0.60}$      |
| $n_s$                       | 0.9670   | $0.9674^{+0.0087}_{-0.0087}$    | $10^9 A_s$                  | 2.088    | $2.088^{+0.070}_{-0.066}$       | $D_M(0.61)$                 | 2297.4   | $2304^{+26}_{-25}$           |
| $y_{cal}$                   | 1.00052  | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8776   | $1.875^{+0.024}_{-0.024}$       | $H(2.33)$                   | 235.69   | $235.7^{+1.5}_{-1.5}$        |
| $A_{100}^{PS}$              | 234.1    | $242^{+50}_{-50}$               | $D_{40}$                    | 1223.0   | $1222^{+26}_{-25}$              | $D_M(2.33)$                 | 5755.3   | $5764^{+31}_{-28}$           |
| $A_{143}^{PS}$              | 43.5     | $40^{+20}_{-20}$                | $D_{220}$                   | 5707     | $5709^{+80}_{-77}$              | $f\sigma_8(0.15)$           | 0.4588   | $0.454^{+0.017}_{-0.018}$    |
| $A_{217}^{PS}$              | 101.9    | $101^{+30}_{-30}$               | $D_{810}$                   | 2534.3   | $2533^{+27}_{-27}$              | $\sigma_8(0.15)$            | 0.7590   | $0.747^{+0.023}_{-0.028}$    |
| $A_{217}^{CIB}$             | 44.6     | $41^{+10}_{-10}$                | $D_{1420}$                  | 815.3    | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4784   | $0.473^{+0.016}_{-0.017}$    |
| $A_{143}^{tSZ}$             | 6.47     | < 7.41                          | $D_{2000}$                  | 230.14   | $229.9^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$            | 0.6731   | $0.662^{+0.020}_{-0.025}$    |
| $r_{143 \times 217}^{PS}$   | 0.626    | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9670   | $0.9674^{+0.0087}_{-0.0087}$    | $f\sigma_8(0.51)$           | 0.4775   | $0.472^{+0.015}_{-0.017}$    |
| $r_{143 \times 217}^{CIB}$  | 0.84     | —                               | $Y_P$                       | 0.245333 | $0.24533^{+0.00016}_{-0.00016}$ | $\sigma_8(0.51)$            | 0.6301   | $0.620^{+0.019}_{-0.024}$    |
| $\xi^{tSZ \times CIB}$      | 0.29     | —                               | $Y_P^{BBN}$                 | 0.246659 | $0.24666^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | 0.4728   | $0.467^{+0.014}_{-0.016}$    |
| $A^{kSZ}$                   | 0.3      | —                               | $10^5 D/H$                  | 2.615    | $2.615^{+0.073}_{-0.070}$       | $\sigma_8(0.61)$            | 0.5996   | $0.590^{+0.018}_{-0.022}$    |
| $A_{100}^{dust}$            | 1.013    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.779   | $13.801^{+0.071}_{-0.064}$      | $f\sigma_8(2.33)$           | 0.3016   | $0.2976^{+0.0083}_{-0.0099}$ |
| $A_{143}^{dust}$            | 0.992    | $0.98^{+0.34}_{-0.34}$          | $z_*$                       | 1090.06  | $1090.02^{+0.58}_{-0.58}$       | $\sigma_8(2.33)$            | 0.3116   | $0.3068^{+0.0091}_{-0.011}$  |
| $A_{217}^{dust}$            | 0.969    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.71   | $144.83^{+0.67}_{-0.64}$        | $f_{2000}^{143}$            | 30.5     | $30^{+6}_{-6}$               |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04118  | $1.04125^{+0.00082}_{-0.00082}$ | $f_{2000}^{217}$            | 107.13   | $107.4^{+3.9}_{-3.9}$        |
| $c_{100}$                   | 0.99764  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.899   | $13.909^{+0.064}_{-0.063}$      | $f_{2000}^{143 \times 217}$ | 32.49    | $33^{+4}_{-4}$               |
| $c_{217}$                   | 1.00136  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.51  | $1059.51^{+0.85}_{-0.87}$       | $\chi_{small}^2$            | 395.87   | 397.0 ( $\nu$ : 1.6)         |
| $H_0$                       | 67.98    | $67.7^{+1.1}_{-1.2}$            | $r_{drag}$                  | 147.43   | $147.55^{+0.71}_{-0.70}$        | $\chi_{lowl}^2$             | 22.93    | 22.85 ( $\nu$ : 0.4)         |
| $\Omega_\Lambda$            | 0.6935   | $0.690^{+0.015}_{-0.015}$       | $k_D$                       | 0.14038  | $0.14027^{+0.00089}_{-0.00088}$ | $\chi_{CamSpec}^2$          | 7050.5   | 7063.9 ( $\nu$ : 15.9)       |
| $\Omega_m$                  | 0.3065   | $0.310^{+0.015}_{-0.015}$       | $100\theta_D$               | 0.16101  | $0.16103^{+0.00051}_{-0.00049}$ | $\chi_{6DF}^2$              | 0.003    | 0.054 ( $\nu$ : 0.0)         |
| $\Omega_m h^2$              | 0.14164  | $0.1418^{+0.0023}_{-0.0023}$    | $z_{eq}$                    | 3384     | $3373^{+59}_{-62}$              | $\chi_{MGS}^2$              | 1.54     | 1.42 ( $\nu$ : 0.1)          |
| $\Omega_\nu h^2$            | 0.00004  | < 0.00170                       | $k_{eq}$                    | 0.010327 | $0.01029^{+0.00018}_{-0.00019}$ | $\chi_{DR12BAO}^2$          | 3.66     | 4.6 ( $\nu$ : 1.2)           |
| $\Omega_m h^3$              | 0.09628  | $0.0960^{+0.0010}_{-0.0011}$    | $100\theta_{eq}$            | 0.8162   | $0.818^{+0.012}_{-0.011}$       | $\chi_{prior}^2$            | 2.1      | 7.6 ( $\nu$ : 6.0)           |
| $\sigma_8$                  | 0.8210   | $0.808^{+0.025}_{-0.031}$       | $100\theta_{s,eq}$          | 0.4510   | $0.4521^{+0.0061}_{-0.0056}$    | $\chi_{BAO}^2$              | 5.21     | 6.1 ( $\nu$ : 0.8)           |
| $S_8$                       | 0.8299   | $0.821^{+0.034}_{-0.035}$       | $H(0.15)$                   | 73.21    | $73.0^{+1.0}_{-1.0}$            | $\chi_{CMB}^2$              | 7469.3   | 7483.8 ( $\nu$ : 15.6)       |

Best-fit  $\chi_{eff}^2 = 7476.59$ ;  $\bar{\chi}_{eff}^2 = 7497.48$ ;  $\Delta\bar{\chi}_{eff}^2 = -0.07$ ;  $R - 1 = 0.00749$

$\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.54 DR12BAO: 3.66 CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 commander\_dx12\_v3.2\_29: 22.93 CamSpec like\_10.7HM: 7050.52



## 5.10 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022200 | $0.02223^{+0.00038}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6099   | $0.602^{+0.021}_{-0.023}$       | $D_M(0.38)$                 | 1523.3   | $1527^{+19}_{-19}$           |
| $\Omega_c h^2$              | 0.11938  | $0.1188^{+0.0024}_{-0.0026}$    | $\sigma_8/h^{0.5}$          | 0.9942   | $0.982^{+0.032}_{-0.036}$       | $H(0.51)$                   | 89.89    | $89.75^{+0.62}_{-0.64}$      |
| $100\theta_{MC}$            | 1.04100  | $1.04107^{+0.00083}_{-0.00082}$ | $r_{drag}h$                 | 100.22   | $100.0^{+1.8}_{-1.8}$           | $D_M(0.51)$                 | 1974.1   | $1978^{+23}_{-22}$           |
| $\tau$                      | 0.0517   | $0.054^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | 2.436    | $2.422^{+0.058}_{-0.063}$       | $H(0.61)$                   | 95.47    | $95.35^{+0.54}_{-0.58}$      |
| $\Sigma m_\nu$ [eV]         | 0.001    | < 0.151                         | $z_{re}$                    | 7.43     | $7.6^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2297.7   | $2303^{+25}_{-24}$           |
| $\ln(10^{10} A_s)$          | 3.0354   | $3.038^{+0.034}_{-0.032}$       | $10^9 A_s$                  | 2.081    | $2.088^{+0.071}_{-0.067}$       | $H(2.33)$                   | 235.66   | $235.6^{+1.5}_{-1.5}$        |
| $n_s$                       | 0.9662   | $0.9677^{+0.0086}_{-0.0085}$    | $10^9 A_s e^{-2\tau}$       | 1.8765   | $1.874^{+0.023}_{-0.023}$       | $D_M(2.33)$                 | 5756.0   | $5763^{+30}_{-27}$           |
| $y_{cal}$                   | 1.00035  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{40}$                    | 1223.7   | $1222^{+26}_{-25}$              | $f\sigma_8(0.15)$           | 0.4581   | $0.454^{+0.017}_{-0.018}$    |
| $A_{100}^{PS}$              | 236.9    | $243^{+50}_{-50}$               | $D_{220}$                   | 5706     | $5710^{+79}_{-77}$              | $\sigma_8(0.15)$            | 0.7578   | $0.747^{+0.023}_{-0.028}$    |
| $A_{143}^{PS}$              | 39.2     | $40^{+20}_{-20}$                | $D_{810}$                   | 2532.5   | $2533^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4775   | $0.473^{+0.016}_{-0.017}$    |
| $A_{217}^{PS}$              | 99.97    | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.4    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6720   | $0.663^{+0.020}_{-0.025}$    |
| $A_{217}^{CIB}$             | 46.1     | $41^{+10}_{-10}$                | $D_{2000}$                  | 229.76   | $229.9^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | 0.4766   | $0.472^{+0.015}_{-0.016}$    |
| $A_{143}^{tSZ}$             | 6.64     | < 7.40                          | $n_{s,0.002}$               | 0.9662   | $0.9677^{+0.0086}_{-0.0085}$    | $\sigma_8(0.51)$            | 0.6290   | $0.620^{+0.019}_{-0.023}$    |
| $r_{143 \times 217}^{PS}$   | 0.559    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.245326 | $0.24534^{+0.00016}_{-0.00016}$ | $f\sigma_8(0.61)$           | 0.4720   | $0.467^{+0.014}_{-0.016}$    |
| $r_{143 \times 217}^{CIB}$  | 0.81     | —                               | $Y_P^{BBN}$                 | 0.246652 | $0.24666^{+0.00016}_{-0.00016}$ | $\sigma_8(0.61)$            | 0.5986   | $0.590^{+0.018}_{-0.022}$    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $10^5 D/H$                  | 2.618    | $2.613^{+0.073}_{-0.069}$       | $f\sigma_8(2.33)$           | 0.3010   | $0.2977^{+0.0082}_{-0.0097}$ |
| $A^{kSZ}$                   | 0.2      | —                               | Age/Gyr                     | 13.781   | $13.798^{+0.069}_{-0.062}$      | $\sigma_8(2.33)$            | 0.3110   | $0.3070^{+0.0090}_{-0.011}$  |
| $A_{100}^{dust}$            | 1.008    | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | 1090.08  | $1089.99^{+0.57}_{-0.57}$       | $f_{2000}^{143}$            | 30.9     | $30^{+6}_{-6}$               |
| $A_{143}^{dust}$            | 0.988    | $0.98^{+0.34}_{-0.34}$          | $r_*$                       | 144.73   | $144.86^{+0.65}_{-0.63}$        | $f_{2000}^{217}$            | 107.38   | $107.3^{+3.9}_{-3.9}$        |
| $A_{217}^{dust}$            | 0.963    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04117  | $1.04127^{+0.00083}_{-0.00082}$ | $f_{2000}^{143 \times 217}$ | 32.74    | $33^{+4}_{-4}$               |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.900   | $13.911^{+0.063}_{-0.061}$      | $\chi_{small}^2$            | 395.76   | $397.0 (\nu: 1.7)$           |
| $c_{100}$                   | 0.99759  | $0.9975^{+0.0020}_{-0.0020}$    | $z_{drag}$                  | 1059.47  | $1059.52^{+0.87}_{-0.85}$       | $\chi_{lowl}^2$             | 23.01    | $22.80 (\nu: 0.4)$           |
| $c_{217}$                   | 1.00140  | $1.0012^{+0.0030}_{-0.0030}$    | $r_{drag}$                  | 147.45   | $147.57^{+0.70}_{-0.69}$        | $\chi_{CamSpec}^2$          | 7050.4   | $7064.0 (\nu: 16.1)$         |
| $H_0$                       | 67.97    | $67.8^{+1.1}_{-1.1}$            | $k_D$                       | 0.14035  | $0.14025^{+0.00088}_{-0.00088}$ | $\chi_{JLA}^2$              | 1034.85  | $1035.02 (\nu: 0.0)$         |
| $\Omega_\Lambda$            | 0.6935   | $0.692^{+0.014}_{-0.014}$       | $100\theta_D$               | 0.16103  | $0.16102^{+0.00052}_{-0.00048}$ | $\chi_{6DF}^2$              | 0.003    | $0.044 (\nu: 0.0)$           |
| $\Omega_m$                  | 0.3065   | $0.308^{+0.014}_{-0.014}$       | $z_{eq}$                    | 3383     | $3370^{+56}_{-60}$              | $\chi_{MGS}^2$              | 1.54     | $1.49 (\nu: 0.1)$            |
| $\Omega_m h^2$              | 0.14159  | $0.1417^{+0.0022}_{-0.0022}$    | $k_{eq}$                    | 0.010326 | $0.01029^{+0.00017}_{-0.00018}$ | $\chi_{DR12BAO}^2$          | 3.66     | $4.4 (\nu: 0.8)$             |
| $\Omega_\nu h^2$            | 0.00001  | < 0.00163                       | $100\theta_{eq}$            | 0.8162   | $0.819^{+0.011}_{-0.010}$       | $\chi_{prior}^2$            | 2.2      | $7.6 (\nu: 5.9)$             |
| $\Omega_m h^3$              | 0.09623  | $0.09601^{+0.00099}_{-0.0011}$  | $100\theta_{s,eq}$          | 0.4510   | $0.4524^{+0.0058}_{-0.0054}$    | $\chi_{BAO}^2$              | 5.21     | $5.9 (\nu: 0.5)$             |
| $\sigma_8$                  | 0.8197   | $0.808^{+0.025}_{-0.030}$       | $H(0.15)$                   | 73.20    | $73.02^{+0.95}_{-0.95}$         | $\chi_{CMB}^2$              | 7469.2   | $7483.8 (\nu: 15.7)$         |
| $S_8$                       | 0.8285   | $0.819^{+0.033}_{-0.035}$       | $D_M(0.15)$                 | 638.2    | $639.9^{+9.4}_{-9.2}$           |                             |          |                              |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4538   | $0.449^{+0.018}_{-0.019}$       | $H(0.38)$                   | 83.22    | $83.07^{+0.73}_{-0.75}$         |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 8511.39$ ;  $\bar{\chi}_{\text{eff}}^2 = 8532.36$ ;  $R - 1 = 0.00853$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.54 DR12BAO: 3.66 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.76 commander\_dx12\_v3.2.29: 23.01 CamSpec like\_10.7HM: 7050.38  
SN - JLA Pantheon18: 1034.85



### 5.11 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02222^{+0.00038}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.018}_{-0.019}$       | $D_M(0.15)$                 | $641^{+10}_{-9.7}$           |
| $\Omega_c h^2$                       | $0.1189^{+0.0025}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.021}_{-0.023}$       | $H(0.38)$                   | $83.03^{+0.76}_{-0.79}$      |
| $100\theta_{MC}$                     | $1.04105^{+0.00082}_{-0.00082}$ | $\sigma_8/h^{0.5}$          | $0.983^{+0.032}_{-0.036}$       | $D_M(0.38)$                 | $1528^{+21}_{-20}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$         | $99.9^{+1.9}_{-1.9}$            | $H(0.51)$                   | $89.72^{+0.64}_{-0.68}$      |
| $\Sigma m_\nu [\text{eV}]$           | $< 0.159$                       | $\langle d^2 \rangle^{1/2}$ | $2.426^{+0.058}_{-0.062}$       | $D_M(0.51)$                 | $1980^{+24}_{-23}$           |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.029}_{-0.027}$       | $z_{\text{re}}$             | $< 8.96$                        | $H(0.61)$                   | $95.32^{+0.56}_{-0.60}$      |
| $n_s$                                | $0.9675^{+0.0086}_{-0.0087}$    | $10^9 A_s$                  | $2.093^{+0.060}_{-0.056}$       | $D_M(0.61)$                 | $2304^{+27}_{-25}$           |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$        |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{40}$                    | $1222^{+26}_{-25}$              | $D_M(2.33)$                 | $5764^{+31}_{-28}$           |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                   | $5709^{+80}_{-77}$              | $f\sigma_8(0.15)$           | $0.455^{+0.017}_{-0.018}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                   | $2533^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.748^{+0.023}_{-0.028}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.473^{+0.016}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.42$                        | $D_{2000}$                  | $229.9^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$            | $0.663^{+0.020}_{-0.025}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.9675^{+0.0086}_{-0.0087}$    | $f\sigma_8(0.51)$           | $0.472^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24533^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.621^{+0.019}_{-0.023}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24666^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.468^{+0.014}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$    | $2.614^{+0.073}_{-0.069}$       | $\sigma_8(0.61)$            | $0.591^{+0.018}_{-0.022}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.801^{+0.071}_{-0.064}$      | $f\sigma_8(2.33)$           | $0.2979^{+0.0080}_{-0.0097}$ |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $z_*$                       | $1090.01^{+0.58}_{-0.58}$       | $\sigma_8(2.33)$            | $0.3072^{+0.0089}_{-0.011}$  |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.83^{+0.67}_{-0.64}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04126^{+0.00082}_{-0.00082}$ | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.909^{+0.064}_{-0.063}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.51^{+0.84}_{-0.88}$       | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.7)$           |
| $H_0$                                | $67.7^{+1.1}_{-1.2}$            | $r_{\text{drag}}$           | $147.55^{+0.71}_{-0.70}$        | $\chi_{\text{lowl}}^2$      | $22.86 (\nu: 0.4)$           |
| $\Omega_\Lambda$                     | $0.691^{+0.015}_{-0.015}$       | $k_D$                       | $0.14027^{+0.00089}_{-0.00088}$ | $\chi_{\text{CamSpec}}^2$   | $7063.8 (\nu: 15.8)$         |
| $\Omega_m$                           | $0.309^{+0.015}_{-0.015}$       | $100\theta_D$               | $0.16102^{+0.00051}_{-0.00048}$ | $\chi_{6\text{DF}}^2$       | $0.053 (\nu: 0.0)$           |
| $\Omega_m h^2$                       | $0.1418^{+0.0023}_{-0.0023}$    | $z_{\text{eq}}$             | $3372^{+59}_{-62}$              | $\chi_{\text{MGS}}^2$       | $1.43 (\nu: 0.2)$            |
| $\Omega_\nu h^2$                     | $< 0.00171$                     | $k_{\text{eq}}$             | $0.01029^{+0.00018}_{-0.00019}$ | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.2)$             |
| $\Omega_m h^3$                       | $0.0960^{+0.0010}_{-0.0011}$    | $100\theta_{\text{eq}}$     | $0.818^{+0.012}_{-0.011}$       | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.809^{+0.025}_{-0.030}$       | $100\theta_{s,\text{eq}}$   | $0.4522^{+0.0061}_{-0.0056}$    | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.8)$             |
| $S_8$                                | $0.821^{+0.034}_{-0.035}$       | $H(0.15)$                   | $73.0^{+1.0}_{-1.0}$            | $\chi_{\text{CMB}}^2$       | $7483.6 (\nu: 15.3)$         |

$$\bar{\chi}_{\text{eff}}^2 = 7497.29; \Delta \bar{\chi}_{\text{eff}}^2 = -0.02; R - 1 = 0.00759$$



## 5.12 base\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02223^{+0.00037}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.020}_{-0.023}$       | $D_M(0.38)$                 | $1527^{+19}_{-19}$           |
| $\Omega_c h^2$              | $0.1188^{+0.0024}_{-0.0026}$    | $\sigma_8/h^{0.5}$          | $0.983^{+0.031}_{-0.035}$       | $H(0.51)$                   | $89.76^{+0.62}_{-0.65}$      |
| $100\theta_{MC}$            | $1.04107^{+0.00083}_{-0.00082}$ | $r_{drag}h$                 | $100.0^{+1.8}_{-1.8}$           | $D_M(0.51)$                 | $1978^{+23}_{-22}$           |
| $\tau$                      | $0.055^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$ | $2.425^{+0.056}_{-0.061}$       | $H(0.61)$                   | $95.35^{+0.54}_{-0.58}$      |
| $\Sigma m_\nu$ [eV]         | $< 0.151$                       | $z_{re}$                    | $< 8.98$                        | $D_M(0.61)$                 | $2302^{+25}_{-24}$           |
| $\ln(10^{10} A_s)$          | $3.041^{+0.029}_{-0.027}$       | $10^9 A_s$                  | $2.093^{+0.061}_{-0.056}$       | $H(2.33)$                   | $235.6^{+1.5}_{-1.4}$        |
| $n_s$                       | $0.9678^{+0.0086}_{-0.0085}$    | $10^9 A_s e^{-2\tau}$       | $1.874^{+0.023}_{-0.023}$       | $D_M(2.33)$                 | $5763^{+30}_{-27}$           |
| $y_{cal}$                   | $1.0005^{+0.0050}_{-0.0049}$    | $D_{40}$                    | $1222^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.017}_{-0.017}$    |
| $A_{100}^{PS}$              | $242^{+50}_{-50}$               | $D_{220}$                   | $5710^{+80}_{-77}$              | $\sigma_8(0.15)$            | $0.748^{+0.023}_{-0.027}$    |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{810}$                   | $2533^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.015}_{-0.017}$    |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-9.9}$              | $\sigma_8(0.38)$            | $0.663^{+0.020}_{-0.024}$    |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{2000}$                  | $230.0^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.472^{+0.015}_{-0.016}$    |
| $A_{143}^{tSZ}$             | $< 7.41$                        | $n_{s,0.002}$               | $0.9678^{+0.0086}_{-0.0085}$    | $\sigma_8(0.51)$            | $0.621^{+0.018}_{-0.022}$    |
| $r_{143 \times 217}^{PS}$   | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24534^{+0.00016}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.467^{+0.014}_{-0.016}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.24666^{+0.00016}_{-0.00016}$ | $\sigma_8(0.61)$            | $0.591^{+0.018}_{-0.021}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.612^{+0.073}_{-0.069}$       | $f\sigma_8(2.33)$           | $0.2981^{+0.0080}_{-0.0094}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.797^{+0.069}_{-0.062}$      | $\sigma_8(2.33)$            | $0.3074^{+0.0088}_{-0.011}$  |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | $1089.98^{+0.57}_{-0.57}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{143}^{dust}$            | $0.98^{+0.34}_{-0.34}$          | $r_*$                       | $144.86^{+0.65}_{-0.63}$        | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$        |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04127^{+0.00083}_{-0.00082}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.912^{+0.063}_{-0.061}$      | $\chi_{simall}^2$           | $397.0 (\nu: 1.7)$           |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $z_{drag}$                  | $1059.53^{+0.86}_{-0.85}$       | $\chi_{lowl}^2$             | $22.81 (\nu: 0.4)$           |
| $c_{217}$                   | $1.0012^{+0.0030}_{-0.0030}$    | $r_{drag}$                  | $147.57^{+0.70}_{-0.69}$        | $\chi_{CamSpec}^2$          | $7063.9 (\nu: 16.0)$         |
| $H_0$                       | $67.8^{+1.1}_{-1.1}$            | $k_D$                       | $0.14025^{+0.00088}_{-0.00088}$ | $\chi_{JLA}^2$              | $1035.02 (\nu: 0.0)$         |
| $\Omega_\Lambda$            | $0.692^{+0.014}_{-0.014}$       | $100\theta_D$               | $0.16102^{+0.00052}_{-0.00048}$ | $\chi_{6DF}^2$              | $0.044 (\nu: 0.0)$           |
| $\Omega_m$                  | $0.308^{+0.014}_{-0.014}$       | $z_{eq}$                    | $3369^{+56}_{-61}$              | $\chi_{MGS}^2$              | $1.50 (\nu: 0.1)$            |
| $\Omega_m h^2$              | $0.1416^{+0.0022}_{-0.0022}$    | $k_{eq}$                    | $0.01028^{+0.00017}_{-0.00018}$ | $\chi_{DR12BAO}^2$          | $4.4 (\nu: 0.8)$             |
| $\Omega_\nu h^2$            | $< 0.00163$                     | $100\theta_{eq}$            | $0.819^{+0.011}_{-0.010}$       | $\chi_{prior}^2$            | $7.6 (\nu: 5.9)$             |
| $\Omega_m h^3$              | $0.09601^{+0.00099}_{-0.0011}$  | $100\theta_{s,eq}$          | $0.4524^{+0.0059}_{-0.0054}$    | $\chi_{BAO}^2$              | $5.9 (\nu: 0.5)$             |
| $\sigma_8$                  | $0.809^{+0.025}_{-0.029}$       | $H(0.15)$                   | $73.03^{+0.94}_{-0.95}$         | $\chi_{CMB}^2$              | $7483.6 (\nu: 15.5)$         |
| $S_8$                       | $0.820^{+0.033}_{-0.034}$       | $D_M(0.15)$                 | $639.8^{+9.4}_{-9.2}$           |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.018}_{-0.019}$       | $H(0.38)$                   | $83.08^{+0.73}_{-0.75}$         |                             |                              |

$\bar{\chi}_{eff}^2 = 8532.17$ ;  $R - 1 = 0.00943$



### 5.13 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022331 | $0.02234^{+0.00029}_{-0.00029}$ | $S_8$                       | 0.8271   | $0.820^{+0.028}_{-0.030}$       | $D_M(0.15)$                 | 637.1    | $640.1^{+9.5}_{-9.2}$        |
| $\Omega_c h^2$              | 0.11924  | $0.1189^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4530   | $0.449^{+0.015}_{-0.016}$       | $H(0.38)$                   | 83.33    | $83.08^{+0.72}_{-0.75}$      |
| $100\theta_{MC}$            | 1.04096  | $1.04095^{+0.00058}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6094   | $0.602^{+0.019}_{-0.020}$       | $D_M(0.38)$                 | 1520.8   | $1527^{+19}_{-19}$           |
| $\tau$                      | 0.0530   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9933   | $0.981^{+0.029}_{-0.032}$       | $H(0.51)$                   | 89.99    | $89.77^{+0.60}_{-0.63}$      |
| $\Sigma m_\nu$ [eV]         | 0.005    | < 0.159                         | $r_{drag} h$                | 100.34   | $99.9^{+1.7}_{-1.8}$            | $D_M(0.51)$                 | 1971.1   | $1979^{+23}_{-22}$           |
| $\ln(10^{10} A_s)$          | 3.0382   | $3.038^{+0.033}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$ | 2.435    | $2.423^{+0.053}_{-0.055}$       | $H(0.61)$                   | 95.57    | $95.38^{+0.51}_{-0.55}$      |
| $n_s$                       | 0.9673   | $0.9675^{+0.0078}_{-0.0075}$    | $z_{re}$                    | 7.54     | $7.6^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2294.4   | $2303^{+25}_{-24}$           |
| $y_{cal}$                   | 1.00028  | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.087    | $2.087^{+0.070}_{-0.065}$       | $H(2.33)$                   | 235.71   | $235.8^{+1.3}_{-1.3}$        |
| $A_{100}^{PS}$              | 232.4    | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8768   | $1.876^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | 5750.8   | $5761^{+28}_{-25}$           |
| $A_{143}^{PS}$              | 41.7     | $39^{+20}_{-20}$                | $D_{40}$                    | 1222.9   | $1223^{+23}_{-24}$              | $f\sigma_8(0.15)$           | 0.4574   | $0.454^{+0.014}_{-0.015}$    |
| $A_{217}^{PS}$              | 102.5    | $103^{+30}_{-30}$               | $D_{220}$                   | 5716     | $5720^{+76}_{-76}$              | $\sigma_8(0.15)$            | 0.7579   | $0.746^{+0.022}_{-0.027}$    |
| $A_{217}^{CIB}$             | 43.9     | $39^{+10}_{-10}$                | $D_{810}$                   | 2534.1   | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | 0.4771   | $0.473^{+0.014}_{-0.015}$    |
| $A_{143}^{tSZ}$             | 6.59     | < 7.50                          | $D_{1420}$                  | 815.9    | $816.1^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6723   | $0.662^{+0.020}_{-0.024}$    |
| $r_{143 \times 217}^{PS}$   | 0.630    | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | 230.49   | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | 0.4764   | $0.471^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{CIB}$  | 0.80     | —                               | $n_{s,0.002}$               | 0.9673   | $0.9675^{+0.0078}_{-0.0075}$    | $\sigma_8(0.51)$            | 0.6294   | $0.619^{+0.018}_{-0.023}$    |
| $\xi^{tSZ \times CIB}$      | 0.26     | —                               | $Y_P$                       | 0.245380 | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4718   | $0.467^{+0.013}_{-0.014}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P^{BBN}$                 | 0.246706 | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5990   | $0.589^{+0.017}_{-0.022}$    |
| $A_{100}^{dust}$            | 1.011    | $1.01^{+0.37}_{-0.38}$          | $10^5 D/H$                  | 2.593    | $2.592^{+0.055}_{-0.053}$       | $f\sigma_8(2.33)$           | 0.3013   | $0.2974^{+0.0080}_{-0.0096}$ |
| $A_{143}^{dust}$            | 0.975    | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | 13.769   | $13.792^{+0.063}_{-0.057}$      | $\sigma_8(2.33)$            | 0.3114   | $0.3066^{+0.0089}_{-0.011}$  |
| $A_{217}^{dust}$            | 0.973    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.897 | $1089.87^{+0.47}_{-0.46}$       | $f_{2000}^{143}$            | 29.7     | $30^{+6}_{-5}$               |
| $A_{143 \times 217}^{dust}$ | 1.006    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.66   | $144.74^{+0.52}_{-0.49}$        | $f_{2000}^{217}$            | 106.53   | $106.8^{+3.7}_{-3.7}$        |
| $c_{100}$                   | 0.99768  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04112  | $1.04114^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | 31.88    | $32^{+4}_{-4}$               |
| $c_{217}$                   | 1.00130  | $1.0011^{+0.0030}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | 13.8951  | $13.902^{+0.050}_{-0.047}$      | $\chi_{small}^2$            | 395.85   | $396.9 (\nu: 1.5)$           |
| $c_{TE}$                    | 0.9964   | $0.9968^{+0.0097}_{-0.0097}$    | $z_{drag}$                  | 1059.78  | $1059.78^{+0.65}_{-0.65}$       | $\chi_{lowl}^2$             | 22.91    | $22.85 (\nu: 0.3)$           |
| $c_{EE}$                    | 0.9921   | $0.9923^{+0.0096}_{-0.0095}$    | $r_{drag}$                  | 147.34   | $147.41^{+0.55}_{-0.52}$        | $\chi_{CamSpec}^2$          | 11499.2  | $11514.8 (\nu: 16.6)$        |
| $H_0$                       | 68.10    | $67.8^{+1.0}_{-1.2}$            | $k_D$                       | 0.14057  | $0.14050^{+0.00065}_{-0.00066}$ | $\chi_{6DF}^2$              | 0.001    | $0.049 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | 0.6946   | $0.691^{+0.013}_{-0.015}$       | $100\theta_D$               | 0.160845 | $0.16085^{+0.00038}_{-0.00037}$ | $\chi_{MGS}^2$              | 1.61     | $1.41 (\nu: 0.1)$            |
| $\Omega_m$                  | 0.3054   | $0.309^{+0.015}_{-0.013}$       | $z_{eq}$                    | 3383.1   | $3376^{+48}_{-49}$              | $\chi_{DR12BAO}^2$          | 3.59     | $4.6 (\nu: 1.1)$             |
| $\Omega_m h^2$              | 0.14162  | $0.1419^{+0.0020}_{-0.0020}$    | $k_{eq}$                    | 0.010325 | $0.01030^{+0.00015}_{-0.00015}$ | $\chi_{prior}^2$            | 2.1      | $7.8 (\nu: 5.9)$             |
| $\Omega_\nu h^2$            | 0.00005  | < 0.00171                       | $100\theta_{eq}$            | 0.8166   | $0.8180^{+0.0093}_{-0.0089}$    | $\chi_{BAO}^2$              | 5.20     | $6.0 (\nu: 0.7)$             |
| $\Omega_m h^3$              | 0.09644  | $0.09616^{+0.00082}_{-0.00089}$ | $100\theta_{s,eq}$          | 0.45112  | $0.4518^{+0.0048}_{-0.0046}$    | $\chi_{CMB}^2$              | 11917.9  | $11934.6 (\nu: 16.8)$        |
| $\sigma_8$                  | 0.8197   | $0.807^{+0.024}_{-0.029}$       | $H(0.15)$                   | 73.32    | $73.01^{+0.90}_{-1.0}$          |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11925.28$ ;  $\bar{\chi}_{\text{eff}}^2 = 11948.38$ ;  $\Delta\chi_{\text{eff}}^2 = 0.10$ ;  $R - 1 = 0.01113$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.61 DR12BAO: 3.59 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12\_v3\_2\_29: 22.91 CamSpec like\_10.7HM\_1400\_unified: 11499.17



### 5.14 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022328 | $0.02234^{+0.00029}_{-0.00029}$ | $S_8$                       | 0.8278   | $0.819^{+0.028}_{-0.029}$       | $D_M(0.15)$                 | 637.1    | $639.4^{+9.4}_{-8.3}$        |
| $\Omega_c h^2$              | 0.11927  | $0.1188^{+0.0020}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4534   | $0.449^{+0.015}_{-0.016}$       | $H(0.38)$                   | 83.33    | $83.13^{+0.65}_{-0.74}$      |
| $100\theta_{MC}$            | 1.04097  | $1.04096^{+0.00058}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6099   | $0.602^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | 1520.8   | $1526^{+19}_{-17}$           |
| $\tau$                      | 0.0533   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9943   | $0.981^{+0.029}_{-0.031}$       | $H(0.51)$                   | 89.99    | $89.81^{+0.57}_{-0.60}$      |
| $\Sigma m_\nu$ [eV]         | 0.001    | < 0.151                         | $r_{drag} h$                | 100.33   | $100.0^{+1.7}_{-1.7}$           | $D_M(0.51)$                 | 1971.0   | $1977^{+23}_{-20}$           |
| $\ln(10^{10} A_s)$          | 3.0390   | $3.038^{+0.033}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$ | 2.437    | $2.422^{+0.054}_{-0.054}$       | $H(0.61)$                   | 95.57    | $95.41^{+0.49}_{-0.52}$      |
| $n_s$                       | 0.9673   | $0.9677^{+0.0078}_{-0.0074}$    | $z_{re}$                    | 7.56     | $7.6^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2294.4   | $2301^{+25}_{-21}$           |
| $y_{cal}$                   | 1.00032  | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.088    | $2.087^{+0.070}_{-0.065}$       | $H(2.33)$                   | 235.71   | $235.8^{+1.2}_{-1.2}$        |
| $A_{100}^{PS}$              | 231.5    | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8775   | $1.875^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | 5750.8   | $5759^{+26}_{-24}$           |
| $A_{143}^{PS}$              | 46.2     | $39^{+20}_{-20}$                | $D_{40}$                    | 1223.3   | $1223^{+23}_{-23}$              | $f\sigma_8(0.15)$           | 0.4578   | $0.453^{+0.014}_{-0.015}$    |
| $A_{217}^{PS}$              | 103.8    | $103^{+30}_{-30}$               | $D_{220}$                   | 5717     | $5721^{+76}_{-77}$              | $\sigma_8(0.15)$            | 0.7587   | $0.747^{+0.022}_{-0.026}$    |
| $A_{217}^{CIB}$             | 43.2     | $39^{+10}_{-10}$                | $D_{810}$                   | 2534.9   | $2534^{+26}_{-26}$              | $f\sigma_8(0.38)$           | 0.4775   | $0.472^{+0.014}_{-0.014}$    |
| $A_{143}^{tSZ}$             | 6.53     | < 7.53                          | $D_{1420}$                  | 816.1    | $816.1^{+9.6}_{-9.4}$           | $\sigma_8(0.38)$            | 0.6730   | $0.662^{+0.019}_{-0.023}$    |
| $r_{143 \times 217}^{PS}$   | 0.679    | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | 230.57   | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | 0.4768   | $0.471^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{CIB}$  | 0.85     | —                               | $n_{s,0.002}$               | 0.9673   | $0.9677^{+0.0078}_{-0.0074}$    | $\sigma_8(0.51)$            | 0.6300   | $0.620^{+0.018}_{-0.021}$    |
| $\xi^{tSZ \times CIB}$      | 0.52     | —                               | $Y_P$                       | 0.245379 | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4722   | $0.467^{+0.013}_{-0.014}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P^{BBN}$                 | 0.246705 | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5995   | $0.590^{+0.017}_{-0.020}$    |
| $A_{100}^{dust}$            | 1.008    | $1.01^{+0.37}_{-0.38}$          | $10^5 D/H$                  | 2.593    | $2.591^{+0.054}_{-0.053}$       | $f\sigma_8(2.33)$           | 0.3016   | $0.2977^{+0.0078}_{-0.0091}$ |
| $A_{143}^{dust}$            | 0.983    | $0.96^{+0.35}_{-0.36}$          | Age/Gyr                     | 13.769   | $13.789^{+0.060}_{-0.055}$      | $\sigma_8(2.33)$            | 0.3116   | $0.3070^{+0.0087}_{-0.010}$  |
| $A_{217}^{dust}$            | 0.978    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.903 | $1089.85^{+0.46}_{-0.45}$       | $f_{2000}^{143}$            | 29.8     | $29^{+6}_{-5}$               |
| $A_{143 \times 217}^{dust}$ | 1.004    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.66   | $144.76^{+0.52}_{-0.48}$        | $f_{2000}^{217}$            | 106.51   | $106.7^{+3.7}_{-3.7}$        |
| $c_{100}$                   | 0.99774  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04112  | $1.04115^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | 31.92    | $32^{+4}_{-4}$               |
| $c_{217}$                   | 1.00133  | $1.0011^{+0.0030}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | 13.8946  | $13.903^{+0.050}_{-0.046}$      | $\chi_{small}^2$            | 395.86   | $397.0 (\nu: 1.5)$           |
| $c_{TE}$                    | 0.9964   | $0.9968^{+0.0097}_{-0.0095}$    | $z_{drag}$                  | 1059.78  | $1059.79^{+0.64}_{-0.62}$       | $\chi_{lowl}^2$             | 22.93    | $22.82 (\nu: 0.3)$           |
| $c_{EE}$                    | 0.9924   | $0.9924^{+0.0095}_{-0.0095}$    | $r_{drag}$                  | 147.34   | $147.43^{+0.53}_{-0.52}$        | $\chi_{CamSpec}^2$          | 11499.3  | $11514.7 (\nu: 17.0)$        |
| $H_0$                       | 68.10    | $67.83^{+0.98}_{-1.1}$          | $k_D$                       | 0.14057  | $0.14049^{+0.00065}_{-0.00065}$ | $\chi_{JLA}^2$              | 1034.819 | $1035.00 (\nu: 0.0)$         |
| $\Omega_\Lambda$            | 0.6946   | $0.692^{+0.013}_{-0.014}$       | $100\theta_D$               | 0.160847 | $0.16084^{+0.00038}_{-0.00037}$ | $\chi_{6DF}^2$              | 0.001    | $0.040 (\nu: 0.0)$           |
| $\Omega_m$                  | 0.3054   | $0.308^{+0.014}_{-0.013}$       | $z_{eq}$                    | 3383.8   | $3374^{+47}_{-48}$              | $\chi_{MGS}^2$              | 1.61     | $1.47 (\nu: 0.1)$            |
| $\Omega_m h^2$              | 0.14160  | $0.1418^{+0.0019}_{-0.0019}$    | $k_{eq}$                    | 0.010327 | $0.01030^{+0.00014}_{-0.00015}$ | $\chi_{DR12BAO}^2$          | 3.60     | $4.4 (\nu: 0.8)$             |
| $\Omega_\nu h^2$            | 0.00001  | < 0.00162                       | $100\theta_{eq}$            | 0.8165   | $0.8184^{+0.0090}_{-0.0087}$    | $\chi_{prior}^2$            | 2.0      | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^3$              | 0.09643  | $0.09618^{+0.00080}_{-0.00086}$ | $100\theta_{s,eq}$          | 0.45106  | $0.4521^{+0.0046}_{-0.0045}$    | $\chi_{BAO}^2$              | 5.21     | $5.89 (\nu: 0.5)$            |
| $\sigma_8$                  | 0.8205   | $0.808^{+0.023}_{-0.028}$       | $H(0.15)$                   | 73.32    | $73.07^{+0.85}_{-0.94}$         | $\chi_{CMB}^2$              | 11918.0  | $11934.5 (\nu: 17.2)$        |

Best-fit  $\chi_{eff}^2 = 12960.09$ ;  $\bar{\chi}_{eff}^2 = 12983.16$ ;  $R - 1 = 0.01385$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.61 DR12BAO: 3.60 CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.86 commander\_dx12\_v3.2.29: 22.93 CamSpec like\_10.7HM\_1400\_unified: 11499.25 SN - JLA Pantheon18: 1034.82



### 5.15 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00029}_{-0.00029}$ | $S_8$                       | $0.820^{+0.028}_{-0.030}$       | $D_M(0.15)$                 | $640^{+10}_{-8.8}$           |
| $\Omega_c h^2$                       | $0.1189^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.015}_{-0.016}$       | $H(0.38)$                   | $83.08^{+0.69}_{-0.79}$      |
| $100\theta_{MC}$                     | $1.04096^{+0.00058}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.019}_{-0.020}$       | $D_M(0.38)$                 | $1527^{+19}_{-19}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.982^{+0.029}_{-0.032}$       | $H(0.51)$                   | $89.78^{+0.60}_{-0.63}$      |
| $\Sigma m_\nu$ [eV]                  | $< 0.160$                       | $r_{\text{drag}} h$         | $99.9^{+1.7}_{-1.8}$            | $D_M(0.51)$                 | $1978^{+23}_{-22}$           |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.029}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$ | $2.426^{+0.052}_{-0.052}$       | $H(0.61)$                   | $95.38^{+0.51}_{-0.55}$      |
| $n_s$                                | $0.9677^{+0.0078}_{-0.0074}$    | $z_{\text{re}}$             | $< 8.92$                        | $D_M(0.61)$                 | $2302^{+25}_{-24}$           |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.093^{+0.060}_{-0.054}$       | $H(2.33)$                   | $235.8^{+1.3}_{-1.3}$        |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | $5761^{+28}_{-25}$           |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1223^{+23}_{-24}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.015}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5720^{+76}_{-76}$              | $\sigma_8(0.15)$            | $0.747^{+0.022}_{-0.027}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.014}_{-0.015}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.49$                        | $D_{1420}$                  | $816.1^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | $0.662^{+0.019}_{-0.024}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.472^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9677^{+0.0078}_{-0.0074}$    | $\sigma_8(0.51)$            | $0.620^{+0.018}_{-0.023}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.467^{+0.013}_{-0.014}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.590^{+0.017}_{-0.022}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.37}_{-0.38}$          | $10^5 \text{D/H}$           | $2.592^{+0.055}_{-0.053}$       | $f\sigma_8(2.33)$           | $0.2977^{+0.0078}_{-0.0096}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $\text{Age/Gyr}$            | $13.792^{+0.063}_{-0.057}$      | $\sigma_8(2.33)$            | $0.3070^{+0.0087}_{-0.011}$  |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.86^{+0.47}_{-0.46}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.74^{+0.52}_{-0.50}$        | $f_{2000}^{217}$            | $106.7^{+3.7}_{-3.7}$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04115^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.902^{+0.050}_{-0.047}$      | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.9968^{+0.0097}_{-0.0096}$    | $z_{\text{drag}}$           | $1059.79^{+0.64}_{-0.65}$       | $\chi_{\text{lowl}}^2$      | $22.86 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9923^{+0.0096}_{-0.0095}$    | $r_{\text{drag}}$           | $147.42^{+0.55}_{-0.52}$        | $\chi_{\text{CamSpec}}^2$   | $11514.6 (\nu: 16.6)$        |
| $H_0$                                | $67.8^{+1.0}_{-1.2}$            | $k_D$                       | $0.14050^{+0.00065}_{-0.00066}$ | $\chi_{6\text{DF}}^2$       | $0.048 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.691^{+0.013}_{-0.014}$       | $100\theta_D$               | $0.16084^{+0.00038}_{-0.00037}$ | $\chi_{\text{MGS}}^2$       | $1.42 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.309^{+0.014}_{-0.013}$       | $z_{\text{eq}}$             | $3375^{+48}_{-49}$              | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.1)$             |
| $\Omega_m h^2$                       | $0.1419^{+0.0020}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01030^{+0.00015}_{-0.00015}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_\nu h^2$                     | $< 0.00173$                     | $100\theta_{\text{eq}}$     | $0.8181^{+0.0092}_{-0.0089}$    | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.7)$             |
| $\Omega_m h^3$                       | $0.09616^{+0.00082}_{-0.00088}$ | $100\theta_{s,\text{eq}}$   | $0.4519^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | $11934.4 (\nu: 16.7)$        |
| $\sigma_8$                           | $0.808^{+0.024}_{-0.029}$       | $H(0.15)$                   | $73.01^{+0.90}_{-1.0}$          |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11948.19; \Delta\bar{\chi}_{\text{eff}}^2 = 0.20; R - 1 = 0.01072$$



# 5.16 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02235^{+0.00029}_{-0.00029}$ | $S_8$                       | $0.820^{+0.028}_{-0.029}$       | $D_M(0.15)$                 | $639.4^{+9.3}_{-8.3}$        |
| $\Omega_c h^2$                       | $0.1188^{+0.0020}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.015}_{-0.016}$       | $H(0.38)$                   | $83.13^{+0.65}_{-0.74}$      |
| $100\theta_{MC}$                     | $1.04097^{+0.00058}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | $1526^{+19}_{-17}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.982^{+0.028}_{-0.031}$       | $H(0.51)$                   | $89.82^{+0.57}_{-0.60}$      |
| $\Sigma m_\nu$ [eV]                  | $< 0.152$                       | $r_{\text{drag}} h$         | $100.0^{+1.7}_{-1.7}$           | $D_M(0.51)$                 | $1977^{+23}_{-20}$           |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.029}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$ | $2.425^{+0.052}_{-0.052}$       | $H(0.61)$                   | $95.41^{+0.49}_{-0.52}$      |
| $n_s$                                | $0.9679^{+0.0079}_{-0.0074}$    | $z_{\text{re}}$             | $< 8.93$                        | $D_M(0.61)$                 | $2301^{+25}_{-22}$           |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.093^{+0.061}_{-0.054}$       | $H(2.33)$                   | $235.7^{+1.2}_{-1.2}$        |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | $5759^{+26}_{-24}$           |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1223^{+23}_{-24}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.015}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5721^{+76}_{-77}$              | $\sigma_8(0.15)$            | $0.748^{+0.021}_{-0.026}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2534^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $D_{1420}$                  | $816.1^{+9.7}_{-9.3}$           | $\sigma_8(0.38)$            | $0.663^{+0.019}_{-0.023}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.5^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.472^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9679^{+0.0079}_{-0.0074}$    | $\sigma_8(0.51)$            | $0.621^{+0.017}_{-0.022}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.467^{+0.013}_{-0.014}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.591^{+0.016}_{-0.021}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.37}_{-0.38}$          | $10^5 \text{D/H}$           | $2.590^{+0.054}_{-0.053}$       | $f\sigma_8(2.33)$           | $0.2980^{+0.0076}_{-0.0091}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.36}$          | $\text{Age/Gyr}$            | $13.789^{+0.060}_{-0.055}$      | $\sigma_8(2.33)$            | $0.3073^{+0.0084}_{-0.010}$  |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.84^{+0.46}_{-0.45}$       | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.76^{+0.52}_{-0.49}$        | $f_{2000}^{217}$            | $106.7^{+3.7}_{-3.8}$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04116^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.904^{+0.050}_{-0.046}$      | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.9968^{+0.0097}_{-0.0095}$    | $z_{\text{drag}}$           | $1059.80^{+0.63}_{-0.63}$       | $\chi_{\text{lowl}}^2$      | $22.83 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9923^{+0.0095}_{-0.0095}$    | $r_{\text{drag}}$           | $147.44^{+0.53}_{-0.52}$        | $\chi_{\text{CamSpec}}^2$   | $11514.6 (\nu: 16.8)$        |
| $H_0$                                | $67.83^{+0.98}_{-1.1}$          | $k_D$                       | $0.14048^{+0.00065}_{-0.00066}$ | $\chi_{\text{JLA}}^2$       | $1035.00 (\nu: 0.0)$         |
| $\Omega_\Lambda$                     | $0.692^{+0.013}_{-0.014}$       | $100\theta_D$               | $0.16084^{+0.00038}_{-0.00037}$ | $\chi_{6\text{DF}}^2$       | $0.040 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.308^{+0.014}_{-0.013}$       | $z_{\text{eq}}$             | $3373^{+47}_{-47}$              | $\chi_{\text{MGS}}^2$       | $1.48 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1418^{+0.0019}_{-0.0020}$    | $k_{\text{eq}}$             | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\text{DR12BAO}}^2$   | $4.4 (\nu: 0.8)$             |
| $\Omega_\nu h^2$                     | $< 0.00163$                     | $100\theta_{\text{eq}}$     | $0.8185^{+0.0089}_{-0.0087}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | $0.09618^{+0.00080}_{-0.00086}$ | $100\theta_{s,\text{eq}}$   | $0.4521^{+0.0046}_{-0.0045}$    | $\chi_{\text{BAO}}^2$       | $5.88 (\nu: 0.5)$            |
| $\sigma_8$                           | $0.809^{+0.023}_{-0.028}$       | $H(0.15)$                   | $73.08^{+0.85}_{-0.95}$         | $\chi_{\text{CMB}}^2$       | $11934.3 (\nu: 17.0)$        |

$$\bar{\chi}_{\text{eff}}^2 = 12982.95; R - 1 = 0.01405$$



## 5.17 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022335 | $0.02233^{+0.00028}_{-0.00028}$ | $S_8$                       | 0.8275   | $0.824^{+0.022}_{-0.022}$       | $D_M(0.15)$                 | 637.1    | $639.9^{+9.2}_{-8.5}$        |
| $\Omega_c h^2$                       | 0.11925  | $0.1191^{+0.0018}_{-0.0018}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4532   | $0.451^{+0.012}_{-0.012}$       | $H(0.38)$                   | 83.33    | $83.10^{+0.63}_{-0.75}$      |
| $100\theta_{MC}$                     | 1.04093  | $1.04094^{+0.00059}_{-0.00060}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6097   | $0.605^{+0.013}_{-0.014}$       | $D_M(0.38)$                 | 1520.8   | $1527^{+19}_{-17}$           |
| $\tau$                               | 0.0533   | $0.054^{+0.014}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9938   | $0.985^{+0.021}_{-0.023}$       | $H(0.51)$                   | 89.99    | $89.80^{+0.53}_{-0.63}$      |
| $\Sigma m_\nu$ [eV]                  | 0.004    | < 0.131                         | $r_{\text{drag}} h$         | 100.33   | $99.9^{+1.6}_{-1.8}$            | $D_M(0.51)$                 | 1971.1   | $1978^{+22}_{-20}$           |
| $\ln(10^{10} A_s)$                   | 3.0391   | $3.041^{+0.029}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$ | 2.4368   | $2.431^{+0.040}_{-0.041}$       | $H(0.61)$                   | 95.569   | $95.40^{+0.47}_{-0.51}$      |
| $n_s$                                | 0.9671   | $0.9670^{+0.0075}_{-0.0074}$    | $z_{\text{re}}$             | 7.56     | $7.7^{+1.4}_{-1.5}$             | $D_M(0.61)$                 | 2294.4   | $2302^{+24}_{-22}$           |
| $y_{\text{cal}}$                     | 1.00049  | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.089    | $2.094^{+0.061}_{-0.058}$       | $H(2.33)$                   | 235.71   | $235.9^{+1.2}_{-1.2}$        |
| $A_{100}^{\text{PS}}$                | 234.6    | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8776   | $1.877^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | 5750.8   | $5759^{+25}_{-23}$           |
| $A_{143}^{\text{PS}}$                | 41.4     | $39^{+20}_{-20}$                | $D_{40}$                    | 1224.1   | $1225^{+22}_{-22}$              | $f\sigma_8(0.15)$           | 0.4576   | $0.456^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | 103.7    | $103^{+30}_{-30}$               | $D_{220}$                   | 5720     | $5724^{+76}_{-75}$              | $\sigma_8(0.15)$            | 0.7583   | $0.750^{+0.017}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | 42.1     | $39^{+10}_{-10}$                | $D_{810}$                   | 2535.1   | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | 0.4774   | $0.4746^{+0.0098}_{-0.011}$  |
| $A_{143}^{\text{tSZ}}$               | 5.60     | < 7.52                          | $D_{1420}$                  | 816.1    | $816.2^{+9.4}_{-9.4}$           | $\sigma_8(0.38)$            | 0.6727   | $0.665^{+0.015}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.641    | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | 230.55   | $230.5^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | 0.4766   | $0.4735^{+0.0093}_{-0.011}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.74     | —                               | $n_{s,0.002}$               | 0.9671   | $0.9670^{+0.0075}_{-0.0074}$    | $\sigma_8(0.51)$            | 0.6297   | $0.622^{+0.014}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.33     | —                               | $Y_P$                       | 0.245382 | $0.24538^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | 0.4720   | $0.4687^{+0.0094}_{-0.010}$  |
| $A^{\text{kSZ}}$                     | 1.5      | —                               | $Y_P^{\text{BBN}}$          | 0.246708 | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5993   | $0.592^{+0.014}_{-0.016}$    |
| $A_{100}^{\text{dust}}$              | 1.010    | $1.01^{+0.38}_{-0.38}$          | $10^5 D/H$                  | 2.592    | $2.593^{+0.053}_{-0.051}$       | $f\sigma_8(2.33)$           | 0.3015   | $0.2986^{+0.0063}_{-0.0073}$ |
| $A_{143}^{\text{dust}}$              | 0.987    | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                     | 13.769   | $13.789^{+0.058}_{-0.053}$      | $\sigma_8(2.33)$            | 0.3115   | $0.3080^{+0.0072}_{-0.0085}$ |
| $A_{217}^{\text{dust}}$              | 0.968    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.892 | $1089.89^{+0.43}_{-0.43}$       | $f_{2000}^{143}$            | 29.6     | $30^{+5}_{-6}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 0.995    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.659  | $144.70^{+0.45}_{-0.45}$        | $f_{2000}^{217}$            | 106.61   | $106.7^{+3.8}_{-3.7}$        |
| $c_{100}$                            | 0.99756  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04110  | $1.04112^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | 31.88    | $32^{+4}_{-4}$               |
| $c_{217}$                            | 1.00108  | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | 13.8949  | $13.898^{+0.044}_{-0.043}$      | $\chi_{\text{lensing}}^2$   | 8.89     | $9.39 (\nu: 0.3)$            |
| $c_{TE}$                             | 0.9965   | $0.9966^{+0.0098}_{-0.0096}$    | $z_{\text{drag}}$           | 1059.78  | $1059.78^{+0.61}_{-0.61}$       | $\chi_{\text{small}}^2$     | 395.87   | $397.0 (\nu: 1.4)$           |
| $c_{EE}$                             | 0.9921   | $0.9924^{+0.0096}_{-0.0098}$    | $r_{\text{drag}}$           | 147.338  | $147.37^{+0.48}_{-0.47}$        | $\chi_{\text{lowl}}^2$      | 22.96    | $23.02 (\nu: 0.3)$           |
| $H_0$                                | 68.10    | $67.77^{+0.95}_{-1.1}$          | $k_D$                       | 0.14058  | $0.14054^{+0.00060}_{-0.00060}$ | $\chi_{\text{CamSpec}}^2$   | 11499.2  | $11514.0 (\nu: 15.2)$        |
| $\Omega_\Lambda$                     | 0.6946   | $0.691^{+0.012}_{-0.014}$       | $100\theta_D$               | 0.160835 | $0.16085^{+0.00037}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | 0.001    | $0.045 (\nu: 0.0)$           |
| $\Omega_m$                           | 0.3054   | $0.309^{+0.014}_{-0.012}$       | $z_{\text{eq}}$             | 3383.4   | $3380^{+42}_{-42}$              | $\chi_{\text{MGS}}^2$       | 1.61     | $1.40 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | 0.14162  | $0.1420^{+0.0019}_{-0.0018}$    | $k_{\text{eq}}$             | 0.010326 | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{\text{DR12BAO}}^2$   | 3.60     | $4.5 (\nu: 1.0)$             |
| $\Omega_\nu h^2$                     | 0.00004  | < 0.00141                       | $100\theta_{\text{eq}}$     | 0.8165   | $0.8172^{+0.0077}_{-0.0078}$    | $\chi_{\text{prior}}^2$     | 2.1      | $7.7 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | 0.09644  | $0.09623^{+0.00075}_{-0.00078}$ | $100\theta_{s,\text{eq}}$   | 0.45110  | $0.4514^{+0.0040}_{-0.0040}$    | $\chi_{\text{CMB}}^2$       | 11926.9  | $11943.4 (\nu: 16.6)$        |
| $\sigma_8$                           | 0.8201   | $0.811^{+0.018}_{-0.021}$       | $H(0.15)$                   | 73.32    | $73.03^{+0.83}_{-0.98}$         | $\chi_{\text{BAO}}^2$       | 5.21     | $6.0 (\nu: 0.6)$             |

Best-fit  $\chi_{\text{eff}}^2 = 11934.26$ ;  $\bar{\chi}_{\text{eff}}^2 = 11957.14$ ;  $\Delta\chi_{\text{eff}}^2 = -0.26$ ;  $R - 1 = 0.00745$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.61 DR12BAO: 3.60 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.89 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 comman-  
der\_dx12\_v3\_2\_29: 22.96 CamSpec like\_10.7HM\_1400\_unified: 11499.19



# 5.18 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022346 | $0.02234^{+0.00028}_{-0.00028}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4525   | $0.451^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1519.6   | $1525^{+17}_{-16}$           |
| $\Omega_c h^2$                       | 0.11912  | $0.1190^{+0.0018}_{-0.0018}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6091   | $0.605^{+0.013}_{-0.014}$       | $H(0.51)$                   | 90.03    | $89.83^{+0.53}_{-0.56}$      |
| $100\theta_{MC}$                     | 1.04097  | $1.04095^{+0.00059}_{-0.00059}$ | $\sigma_8/h^{0.5}$          | 0.9932   | $0.986^{+0.021}_{-0.022}$       | $D_M(0.51)$                 | 1969.7   | $1977^{+21}_{-18}$           |
| $\tau$                               | 0.0533   | $0.055^{+0.014}_{-0.015}$       | $r_{\text{drag}} h$         | 100.45   | $99.99^{+1.5}_{-1.6}$           | $H(0.61)$                   | 95.597   | $95.43^{+0.45}_{-0.48}$      |
| $\Sigma m_\nu$ [eV]                  | 0.001    | < 0.125                         | $\langle d^2 \rangle^{1/2}$ | 2.4348   | $2.430^{+0.040}_{-0.041}$       | $D_M(0.61)$                 | 2292.9   | $2300^{+23}_{-20}$           |
| $\ln(10^{10} A_s)$                   | 3.0391   | $3.042^{+0.029}_{-0.028}$       | $z_{\text{re}}$             | 7.56     | $7.7^{+1.4}_{-1.5}$             | $H(2.33)$                   | 235.63   | $235.8^{+1.1}_{-1.1}$        |
| $n_s$                                | 0.9675   | $0.9672^{+0.0075}_{-0.0074}$    | $10^9 A_s$                  | 2.089    | $2.094^{+0.061}_{-0.058}$       | $D_M(2.33)$                 | 5749.6   | $5758^{+24}_{-22}$           |
| $y_{\text{cal}}$                     | 1.00045  | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | 1.8774   | $1.877^{+0.021}_{-0.020}$       | $f\sigma_8(0.15)$           | 0.4569   | $0.455^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | 231.8    | $239^{+50}_{-50}$               | $D_{40}$                    | 1223.3   | $1225^{+22}_{-22}$              | $\sigma_8(0.15)$            | 0.7583   | $0.750^{+0.016}_{-0.019}$    |
| $A_{143}^{\text{PS}}$                | 44.3     | $39^{+20}_{-20}$                | $D_{220}$                   | 5721     | $5724^{+76}_{-76}$              | $f\sigma_8(0.38)$           | 0.4769   | $0.4745^{+0.0096}_{-0.011}$  |
| $A_{217}^{\text{PS}}$                | 103.3    | $103^{+30}_{-30}$               | $D_{810}$                   | 2535.5   | $2536^{+26}_{-26}$              | $\sigma_8(0.38)$            | 0.6728   | $0.665^{+0.014}_{-0.017}$    |
| $A_{217}^{\text{CIB}}$               | 43.3     | $39^{+10}_{-10}$                | $D_{1420}$                  | 816.4    | $816.3^{+9.3}_{-9.4}$           | $f\sigma_8(0.51)$           | 0.4762   | $0.4735^{+0.0095}_{-0.010}$  |
| $A_{143}^{\text{tSZ}}$               | 6.49     | < 7.55                          | $D_{2000}$                  | 230.66   | $230.5^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | 0.6298   | $0.623^{+0.014}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.662    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9675   | $0.9672^{+0.0075}_{-0.0074}$    | $f\sigma_8(0.61)$           | 0.4717   | $0.4687^{+0.0092}_{-0.0098}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.83     | —                               | $Y_{\text{P}}$              | 0.245386 | $0.24538^{+0.00011}_{-0.00011}$ | $\sigma_8(0.61)$            | 0.5994   | $0.593^{+0.013}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.42     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.246712 | $0.24671^{+0.00011}_{-0.00011}$ | $f\sigma_8(2.33)$           | 0.3015   | $0.2989^{+0.0061}_{-0.0070}$ |
| $A^{\text{kSZ}}$                     | 0.1      | —                               | $10^5 D/H$                  | 2.590    | $2.592^{+0.053}_{-0.051}$       | $\sigma_8(2.33)$            | 0.3116   | $0.3083^{+0.0069}_{-0.0081}$ |
| $A_{100}^{\text{dust}}$              | 1.014    | $1.01^{+0.37}_{-0.38}$          | Age/Gyr                     | 13.766   | $13.786^{+0.055}_{-0.051}$      | $f_{2000}^{143}$            | 29.6     | $29^{+5}_{-6}$               |
| $A_{143}^{\text{dust}}$              | 0.977    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.868 | $1089.87^{+0.43}_{-0.42}$       | $f_{2000}^{217}$            | 106.43   | $106.7^{+3.8}_{-3.7}$        |
| $A_{217}^{\text{dust}}$              | 0.975    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 144.683  | $144.71^{+0.45}_{-0.44}$        | $f_{2000}^{143 \times 217}$ | 31.82    | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 1.004    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04112  | $1.04113^{+0.00058}_{-0.00058}$ | $\chi_{\text{lensing}}^2$   | 8.88     | $9.38 (\nu: 0.3)$            |
| $c_{100}$                            | 0.99773  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.8969  | $13.899^{+0.043}_{-0.042}$      | $\chi_{\text{simall}}^2$    | 395.86   | $397.0 (\nu: 1.4)$           |
| $c_{217}$                            | 1.00128  | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | 1059.82  | $1059.79^{+0.60}_{-0.62}$       | $\chi_{\text{lowl}}^2$      | 22.90    | $22.99 (\nu: 0.3)$           |
| $c_{TE}$                             | 0.9964   | $0.9965^{+0.0098}_{-0.0096}$    | $r_{\text{drag}}$           | 147.357  | $147.39^{+0.47}_{-0.47}$        | $\chi_{\text{CamSpec}}^2$   | 11499.3  | $11514.0 (\nu: 15.0)$        |
| $c_{EE}$                             | 0.9922   | $0.9925^{+0.0096}_{-0.0098}$    | $k_{\text{D}}$              | 0.14056  | $0.14053^{+0.00059}_{-0.00061}$ | $\chi_{\text{JLA}}^2$       | 1034.797 | $1034.99 (\nu: 0.0)$         |
| $H_0$                                | 68.17    | $67.84^{+0.90}_{-1.0}$          | $100\theta_{\text{D}}$      | 0.160829 | $0.16084^{+0.00037}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | 0.000    | $0.037 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | 0.6955   | $0.692^{+0.011}_{-0.013}$       | $z_{\text{eq}}$             | 3380.7   | $3378^{+41}_{-41}$              | $\chi_{\text{MGS}}^2$       | 1.68     | $1.46 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | 0.3045   | $0.308^{+0.013}_{-0.011}$       | $k_{\text{eq}}$             | 0.010318 | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\text{DR12BAO}}^2$   | 3.52     | $4.3 (\nu: 0.7)$             |
| $\Omega_{\text{m}} h^2$              | 0.14148  | $0.1419^{+0.0018}_{-0.0017}$    | $100\theta_{\text{eq}}$     | 0.8171   | $0.8176^{+0.0076}_{-0.0076}$    | $\chi_{\text{prior}}^2$     | 2.1      | $7.7 (\nu: 5.8)$             |
| $\Omega_\nu h^2$                     | 0.00001  | < 0.00134                       | $100\theta_{\text{s,eq}}$   | 0.45137  | $0.4516^{+0.0039}_{-0.0039}$    | $\chi_{\text{CMB}}^2$       | 11926.9  | $11943.4 (\nu: 16.3)$        |
| $\Omega_{\text{m}} h^3$              | 0.09644  | $0.09625^{+0.00070}_{-0.00079}$ | $H(0.15)$                   | 73.38    | $73.09^{+0.78}_{-0.90}$         | $\chi_{\text{BAO}}^2$       | 5.20     | $5.84 (\nu: 0.4)$            |
| $\sigma_8$                           | 0.8200   | $0.812^{+0.017}_{-0.020}$       | $D_M(0.15)$                 | 636.5    | $639.3^{+8.8}_{-7.6}$           |                             |          |                              |
| $S_8$                                | 0.8261   | $0.823^{+0.021}_{-0.021}$       | $H(0.38)$                   | 83.38    | $83.15^{+0.60}_{-0.69}$         |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 12968.97$ ;  $\Delta\chi_{\text{eff}}^2 = -1.51$ ;  $\bar{\chi}_{\text{eff}}^2 = 12991.94$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -0.45$ ;  $R - 1 = 0.00817$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 ( $\Delta$  -0.02) MGS: 1.68 ( $\Delta$  0.40) DR12BAO: 3.52 ( $\Delta$  -0.71) CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consect8: 8.88 ( $\Delta$  -0.08) simall\_100x143\_offlike5\_EE\_Aplanc 395.86 ( $\Delta$  -0.19) commander\_dx12\_v3.2\_29: 22.90 ( $\Delta$  0.13) CamSpec like\_10.7HM.1400\_unified: 11499.28 ( $\Delta$  -0.89) SN - JLA Pantheon18: 1034.80 ( $\Delta$  -0.18)



# 5.19 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00028}_{-0.00028}$ | $S_8$                       | $0.824^{+0.021}_{-0.021}$       | $D_M(0.15)$                 | $639.8^{+9.2}_{-8.5}$        |
| $\Omega_c h^2$                       | $0.1191^{+0.0018}_{-0.0018}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.012}_{-0.012}$       | $H(0.38)$                   | $83.11^{+0.63}_{-0.75}$      |
| $100\theta_{MC}$                     | $1.04094^{+0.00059}_{-0.00060}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.605^{+0.013}_{-0.014}$       | $D_M(0.38)$                 | $1527^{+19}_{-17}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.021}_{-0.022}$       | $H(0.51)$                   | $89.80^{+0.55}_{-0.60}$      |
| $\Sigma m_\nu$ [eV]                  | $< 0.132$                       | $r_{\text{drag}} h$         | $99.9^{+1.6}_{-1.8}$            | $D_M(0.51)$                 | $1978^{+22}_{-20}$           |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.026}_{-0.024}$       | $\langle d^2 \rangle^{1/2}$ | $2.433^{+0.039}_{-0.039}$       | $H(0.61)$                   | $95.40^{+0.47}_{-0.51}$      |
| $n_s$                                | $0.9671^{+0.0075}_{-0.0073}$    | $z_{\text{re}}$             | $7.8^{+1.1}_{-1.3}$             | $D_M(0.61)$                 | $2302^{+24}_{-22}$           |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.097^{+0.055}_{-0.051}$       | $H(2.33)$                   | $235.9^{+1.2}_{-1.2}$        |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | $5759^{+25}_{-23}$           |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1225^{+22}_{-22}$              | $f\sigma_8(0.15)$           | $0.456^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5723^{+76}_{-75}$              | $\sigma_8(0.15)$            | $0.750^{+0.016}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4749^{+0.0098}_{-0.011}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{1420}$                  | $816.1^{+9.4}_{-9.4}$           | $\sigma_8(0.38)$            | $0.665^{+0.015}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | $230.5^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.4737^{+0.0096}_{-0.0099}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9671^{+0.0075}_{-0.0073}$    | $\sigma_8(0.51)$            | $0.623^{+0.014}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.4689^{+0.0093}_{-0.0098}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.593^{+0.013}_{-0.016}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $10^5 D/H$                  | $2.592^{+0.053}_{-0.051}$       | $f\sigma_8(2.33)$           | $0.2988^{+0.0062}_{-0.0072}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                     | $13.789^{+0.058}_{-0.053}$      | $\sigma_8(2.33)$            | $0.3082^{+0.0071}_{-0.0085}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.88^{+0.43}_{-0.43}$       | $f_{2000}^{143}$            | $29^{+5}_{-6}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.70^{+0.45}_{-0.44}$        | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.7}$        |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04113^{+0.00058}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.898^{+0.044}_{-0.043}$      | $\chi^2_{\text{lensing}}$   | $9.34 (\nu: 0.3)$            |
| $c_{TE}$                             | $0.9965^{+0.0098}_{-0.0095}$    | $z_{\text{drag}}$           | $1059.79^{+0.60}_{-0.62}$       | $\chi^2_{\text{simall}}$    | $396.9 (\nu: 1.4)$           |
| $c_{EE}$                             | $0.9924^{+0.0096}_{-0.0098}$    | $r_{\text{drag}}$           | $147.38^{+0.48}_{-0.48}$        | $\chi^2_{\text{lowl}}$      | $23.02 (\nu: 0.3)$           |
| $H_0$                                | $67.78^{+0.95}_{-1.1}$          | $k_D$                       | $0.14053^{+0.00060}_{-0.00061}$ | $\chi^2_{\text{CamSpec}}$   | $11513.9 (\nu: 15.1)$        |
| $\Omega_\Lambda$                     | $0.691^{+0.012}_{-0.014}$       | $100\theta_D$               | $0.16084^{+0.00037}_{-0.00036}$ | $\chi^2_{6\text{DF}}$       | $0.044 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.309^{+0.014}_{-0.012}$       | $z_{\text{eq}}$             | $3379^{+41}_{-42}$              | $\chi^2_{\text{MGS}}$       | $1.41 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1420^{+0.0019}_{-0.0018}$    | $k_{\text{eq}}$             | $0.01031^{+0.00013}_{-0.00013}$ | $\chi^2_{\text{DR12BAO}}$   | $4.5 (\nu: 1.0)$             |
| $\Omega_\nu h^2$                     | $< 0.00142$                     | $100\theta_{\text{eq}}$     | $0.8173^{+0.0077}_{-0.0077}$    | $\chi^2_{\text{prior}}$     | $7.7 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | $0.09623^{+0.00075}_{-0.00078}$ | $100\theta_{s,\text{eq}}$   | $0.4515^{+0.0040}_{-0.0039}$    | $\chi^2_{\text{CMB}}$       | $11943.2 (\nu: 16.3)$        |
| $\sigma_8$                           | $0.812^{+0.018}_{-0.021}$       | $H(0.15)$                   | $73.03^{+0.83}_{-0.98}$         | $\chi^2_{\text{BAO}}$       | $6.0 (\nu: 0.6)$             |

$$\bar{\chi}^2_{\text{eff}} = 11956.94; \Delta\bar{\chi}^2_{\text{eff}} = -0.31; R - 1 = 0.00819$$



## 5.20 base\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02234^{+0.00028}_{-0.00028}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.451^{+0.011}_{-0.012}$       | $D_{\text{M}}(0.38)$        | $1525^{+17}_{-16}$           |
| $\Omega_{\text{c}}h^2$               | $0.1190^{+0.0018}_{-0.0018}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.605^{+0.013}_{-0.014}$       | $H(0.51)$                   | $89.84^{+0.53}_{-0.56}$      |
| $100\theta_{\text{MC}}$              | $1.04095^{+0.00059}_{-0.00059}$ | $\sigma_8/h^{0.5}$                 | $0.986^{+0.020}_{-0.022}$       | $D_{\text{M}}(0.51)$        | $1976^{+21}_{-19}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $r_{\text{drag}}h$                 | $100.0^{+1.5}_{-1.6}$           | $H(0.61)$                   | $95.43^{+0.46}_{-0.48}$      |
| $\Sigma m_{\nu} [\text{eV}]$         | $< 0.126$                       | $\langle d^2 \rangle^{1/2}$        | $2.432^{+0.039}_{-0.039}$       | $D_{\text{M}}(0.61)$        | $2300^{+23}_{-20}$           |
| $\ln(10^{10}A_{\text{s}})$           | $3.043^{+0.026}_{-0.024}$       | $z_{\text{re}}$                    | $7.8^{+1.2}_{-1.3}$             | $H(2.33)$                   | $235.8^{+1.1}_{-1.1}$        |
| $n_{\text{s}}$                       | $0.9673^{+0.0075}_{-0.0073}$    | $10^9 A_{\text{s}}$                | $2.097^{+0.055}_{-0.051}$       | $D_{\text{M}}(2.33)$        | $5758^{+24}_{-22}$           |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.877^{+0.020}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.456^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                           | $1225^{+22}_{-22}$              | $\sigma_8(0.15)$            | $0.751^{+0.016}_{-0.019}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                          | $5724^{+76}_{-76}$              | $f\sigma_8(0.38)$           | $0.4747^{+0.0095}_{-0.010}$  |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                          | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.666^{+0.014}_{-0.017}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                         | $816.2^{+9.3}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.4737^{+0.0094}_{-0.0097}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $D_{2000}$                         | $230.5^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | $0.623^{+0.014}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{\text{s},0.002}$               | $0.9673^{+0.0075}_{-0.0073}$    | $f\sigma_8(0.61)$           | $0.4690^{+0.0091}_{-0.0096}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24538^{+0.00011}_{-0.00011}$ | $\sigma_8(0.61)$            | $0.593^{+0.013}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24671^{+0.00011}_{-0.00011}$ | $f\sigma_8(2.33)$           | $0.2991^{+0.0060}_{-0.0069}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$           | $2.591^{+0.053}_{-0.051}$       | $\sigma_8(2.33)$            | $0.3085^{+0.0068}_{-0.0081}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.37}_{-0.38}$          | $\text{Age}/\text{Gyr}$            | $13.786^{+0.055}_{-0.051}$      | $f_{2000}^{143}$            | $29^{+5}_{-6}$               |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.33}$          | $z_*$                              | $1089.86^{+0.42}_{-0.43}$       | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.7}$        |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                              | $144.72^{+0.45}_{-0.44}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                      | $1.04114^{+0.00058}_{-0.00058}$ | $\chi_{\text{lensing}}^2$   | $9.33 (\nu: 0.3)$            |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.900^{+0.043}_{-0.042}$      | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.4)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                  | $1059.80^{+0.63}_{-0.63}$       | $\chi_{\text{lowl}}^2$      | $22.99 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9965^{+0.0098}_{-0.0096}$    | $r_{\text{drag}}$                  | $147.39^{+0.47}_{-0.47}$        | $\chi_{\text{CamSpec}}^2$   | $11514.0 (\nu: 15.0)$        |
| $c_{EE}$                             | $0.9925^{+0.0096}_{-0.0098}$    | $k_{\text{D}}$                     | $0.14052^{+0.00059}_{-0.00061}$ | $\chi_{\text{JLA}}^2$       | $1034.99 (\nu: 0.0)$         |
| $H_0$                                | $67.85^{+0.90}_{-1.0}$          | $100\theta_{\text{D}}$             | $0.16084^{+0.00037}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | $0.036 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.692^{+0.012}_{-0.013}$       | $z_{\text{eq}}$                    | $3378^{+40}_{-41}$              | $\chi_{\text{MGS}}^2$       | $1.47 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.308^{+0.013}_{-0.012}$       | $k_{\text{eq}}$                    | $0.01031^{+0.00012}_{-0.00013}$ | $\chi_{\text{DR12BAO}}^2$   | $4.3 (\nu: 0.7)$             |
| $\Omega_{\text{m}}h^2$               | $0.1419^{+0.0018}_{-0.0017}$    | $100\theta_{\text{eq}}$            | $0.8177^{+0.0076}_{-0.0075}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.8)$             |
| $\Omega_{\nu}h^2$                    | $< 0.00135$                     | $100\theta_{\text{s,eq}}$          | $0.4517^{+0.0039}_{-0.0039}$    | $\chi_{\text{CMB}}^2$       | $11943.2 (\nu: 16.0)$        |
| $\Omega_{\text{m}}h^3$               | $0.09625^{+0.00070}_{-0.00080}$ | $H(0.15)$                          | $73.09^{+0.78}_{-0.90}$         | $\chi_{\text{BAO}}^2$       | $5.83 (\nu: 0.4)$            |
| $\sigma_8$                           | $0.812^{+0.017}_{-0.020}$       | $D_{\text{M}}(0.15)$               | $639.2^{+8.8}_{-7.6}$           |                             |                              |
| $S_8$                                | $0.823^{+0.021}_{-0.021}$       | $H(0.38)$                          | $83.15^{+0.60}_{-0.70}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12991.75; \Delta\bar{\chi}_{\text{eff}}^2 = -0.50; R - 1 = 0.00951$$



## 6 nnu

### 6.1 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.02199  | $0.02204^{+0.00062}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4606   | $0.460^{+0.027}_{-0.026}$       | $H(0.15)$                   | 71.08    | $71.5^{+4.8}_{-4.4}$      |
| $\Omega_c h^2$              | 0.1187   | $0.1192^{+0.0082}_{-0.0078}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6089   | $0.609^{+0.024}_{-0.024}$       | $D_M(0.15)$                 | 658.8    | $655^{+45}_{-44}$         |
| $100\theta_{MC}$            | 1.04101  | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9931   | $0.992^{+0.032}_{-0.033}$       | $H(0.38)$                   | 81.35    | $81.8^{+4.6}_{-4.3}$      |
| $\tau$                      | 0.0502   | $0.051^{+0.016}_{-0.016}$       | $r_{drag} h$                | 97.67    | $98.1^{+4.5}_{-4.3}$            | $D_M(0.38)$                 | 1567     | $1559^{+99}_{-97}$        |
| $N_{eff}$                   | 2.89     | $2.94^{+0.59}_{-0.56}$          | $\langle d^2 \rangle^{1/2}$ | 2.462    | $2.457^{+0.091}_{-0.090}$       | $H(0.51)$                   | 88.14    | $88.6^{+4.5}_{-4.3}$      |
| $\ln(10^{10} A_s)$          | 3.0298   | $3.033^{+0.041}_{-0.042}$       | $z_{re}$                    | 7.30     | $7.4^{+1.6}_{-1.7}$             | $D_M(0.51)$                 | 2028     | $2017^{+120}_{-120}$      |
| $n_s$                       | 0.9569   | $0.959^{+0.027}_{-0.026}$       | $10^9 A_s$                  | 2.069    | $2.077^{+0.087}_{-0.086}$       | $H(0.61)$                   | 93.82    | $94.3^{+4.5}_{-4.3}$      |
| $y_{cal}$                   | 1.00028  | $1.0004^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8717   | $1.874^{+0.045}_{-0.046}$       | $D_M(0.61)$                 | 2357     | $2346^{+140}_{-140}$      |
| $A_{100}^{PS}$              | 234      | $240^{+50}_{-50}$               | $D_{40}$                    | 1238.2   | $1236^{+45}_{-44}$              | $H(2.33)$                   | 234.8    | $235.3^{+7.4}_{-7.2}$     |
| $A_{143}^{PS}$              | 39.3     | $40^{+20}_{-20}$                | $D_{220}$                   | 5700     | $5702^{+82}_{-82}$              | $D_M(2.33)$                 | 5848     | $5826^{+260}_{-260}$      |
| $A_{217}^{PS}$              | 101.3    | $102^{+30}_{-30}$               | $D_{810}$                   | 2531.6   | $2532^{+29}_{-28}$              | $f\sigma_8(0.15)$           | 0.4638   | $0.463^{+0.025}_{-0.024}$ |
| $A_{217}^{CIB}$             | 45.0     | $40^{+20}_{-10}$                | $D_{1420}$                  | 814.7    | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.7422   | $0.744^{+0.027}_{-0.026}$ |
| $A_{143}^{tSZ}$             | 6.61     | $< 7.46$                        | $D_{2000}$                  | 230.25   | $230.1^{+4.6}_{-4.6}$           | $f\sigma_8(0.38)$           | 0.4785   | $0.478^{+0.019}_{-0.019}$ |
| $r_{143 \times 217}^{PS}$   | 0.592    | $0.65^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | 0.9569   | $0.959^{+0.027}_{-0.026}$       | $\sigma_8(0.38)$            | 0.6562   | $0.658^{+0.025}_{-0.025}$ |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $Y_P$                       | 0.2431   | $0.2438^{+0.0079}_{-0.0080}$    | $f\sigma_8(0.51)$           | 0.4752   | $0.475^{+0.017}_{-0.017}$ |
| $\xi^{tSZ \times CIB}$      | 0.08     | —                               | $Y_P^{BBN}$                 | 0.2444   | $0.2451^{+0.0080}_{-0.0080}$    | $\sigma_8(0.51)$            | 0.6134   | $0.616^{+0.024}_{-0.024}$ |
| $A^{kSZ}$                   | 0.0      | —                               | $10^5 D/H$                  | 2.602    | $2.61^{+0.14}_{-0.14}$          | $f\sigma_8(0.61)$           | 0.4690   | $0.469^{+0.016}_{-0.016}$ |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 14.00    | $13.94^{+0.62}_{-0.60}$         | $\sigma_8(0.61)$            | 0.5833   | $0.585^{+0.024}_{-0.023}$ |
| $A_{143}^{dust}$            | 0.989    | $0.97^{+0.34}_{-0.34}$          | $z_*$                       | 1090.13  | $1090.16^{+0.99}_{-0.97}$       | $f\sigma_8(2.33)$           | 0.2935   | $0.295^{+0.013}_{-0.013}$ |
| $A_{217}^{dust}$            | 0.967    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 145.9    | $145.5^{+5.2}_{-5.0}$           | $\sigma_8(2.33)$            | 0.3019   | $0.303^{+0.014}_{-0.014}$ |
| $A_{143 \times 217}^{dust}$ | 1.011    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04133  | $1.0413^{+0.0014}_{-0.0014}$    | $f_{2000}^{143}$            | 30.0     | $30^{+7}_{-7}$            |
| $c_{100}$                   | 0.99758  | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 14.008   | $13.97^{+0.49}_{-0.47}$         | $f_{2000}^{217}$            | 106.85   | $107.1^{+4.9}_{-4.9}$     |
| $c_{217}$                   | 1.00132  | $1.0011^{+0.0030}_{-0.0031}$    | $z_{drag}$                  | 1058.83  | $1059.0^{+2.2}_{-2.2}$          | $f_{2000}^{143 \times 217}$ | 32.2     | $32^{+5}_{-5}$            |
| $H_0$                       | 65.69    | $66.2^{+4.9}_{-4.6}$            | $r_{drag}$                  | 148.7    | $148.3^{+5.5}_{-5.3}$           | $\chi_{simall}^2$           | 395.70   | $396.9 (\nu: 1.4)$        |
| $\Omega_\Lambda$            | 0.6725   | $0.675^{+0.036}_{-0.038}$       | $k_D$                       | 0.13952  | $0.1398^{+0.0038}_{-0.0037}$    | $\chi_{lowl}^2$             | 24.43    | $24.4 (\nu: 2.7)$         |
| $\Omega_m$                  | 0.3275   | $0.325^{+0.038}_{-0.036}$       | $100\theta_D$               | 0.16074  | $0.1608^{+0.0014}_{-0.0013}$    | $\chi_{CamSpec}^2$          | 7049.2   | $7063.3 (\nu: 16.5)$      |
| $\Omega_m h^2$              | 0.1413   | $0.1419^{+0.0085}_{-0.0081}$    | $z_{eq}$                    | 3435     | $3425^{+130}_{-130}$            | $\chi_{prior}^2$            | 2.1      | $7.6 (\nu: 5.8)$          |
| $\Omega_m h^3$              | 0.0928   | $0.094^{+0.012}_{-0.011}$       | $k_{eq}$                    | 0.010371 | $0.01037^{+0.00033}_{-0.00031}$ | $\chi_{CMB}^2$              | 7469.3   | $7484.6 (\nu: 15.8)$      |
| $\sigma_8$                  | 0.8049   | $0.807^{+0.028}_{-0.027}$       | $100\theta_{eq}$            | 0.8065   | $0.809^{+0.025}_{-0.024}$       |                             |          |                           |
| $S_8$                       | 0.8410   | $0.839^{+0.050}_{-0.048}$       | $100\theta_{s,eq}$          | 0.4461   | $0.447^{+0.013}_{-0.012}$       |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7471.42$ ;  $\Delta\chi_{eff}^2 = -0.31$ ;  $\bar{\chi}_{eff}^2 = 7492.17$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.63$ ;  $R - 1 = 0.00609$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.70 ( $\Delta$  -0.14) commander\_dx12\_v3\_2\_29: 24.43 ( $\Delta$  1.04) CamSpec like\_10.7HM: 7049.22 ( $\Delta$  -1.12)



## 6.2 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02202^{+0.00059}_{-0.00059}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.458^{+0.018}_{-0.018}$       | $H(0.15)$                   | $71.3^{+4.3}_{-4.1}$      |
| $\Omega_{\text{c}} h^2$              | $0.1182^{+0.0076}_{-0.0075}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.607^{+0.017}_{-0.016}$       | $D_{\text{M}}(0.15)$        | $658^{+41}_{-40}$         |
| $100\theta_{\text{MC}}$              | $1.0411^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$                  | $0.990^{+0.021}_{-0.021}$       | $H(0.38)$                   | $81.5^{+4.2}_{-4.0}$      |
| $\tau$                               | $0.051^{+0.016}_{-0.015}$       | $r_{\text{drag}} h$                 | $98.0^{+3.6}_{-3.5}$            | $D_{\text{M}}(0.38)$        | $1565^{+92}_{-89}$        |
| $N_{\text{eff}}$                     | $2.89^{+0.56}_{-0.54}$          | $\langle d^2 \rangle^{1/2}$         | $2.457^{+0.063}_{-0.063}$       | $H(0.51)$                   | $88.2^{+4.2}_{-4.0}$      |
| $\ln(10^{10} A_{\text{s}})$          | $3.031^{+0.041}_{-0.042}$       | $z_{\text{re}}$                     | $7.4^{+1.6}_{-1.7}$             | $D_{\text{M}}(0.51)$        | $2025^{+110}_{-110}$      |
| $n_{\text{s}}$                       | $0.958^{+0.024}_{-0.024}$       | $10^9 A_{\text{s}}$                 | $2.072^{+0.086}_{-0.086}$       | $H(0.61)$                   | $93.9^{+4.2}_{-4.1}$      |
| $y_{\text{cal}}$                     | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.869^{+0.043}_{-0.044}$       | $D_{\text{M}}(0.61)$        | $2355^{+130}_{-130}$      |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                            | $1237^{+37}_{-37}$              | $H(2.33)$                   | $234.5^{+7.0}_{-7.1}$     |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                           | $5705^{+81}_{-81}$              | $D_{\text{M}}(2.33)$        | $5848^{+250}_{-240}$      |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                           | $2532^{+29}_{-27}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                          | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.742^{+0.025}_{-0.026}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{2000}$                          | $230.4^{+4.5}_{-4.5}$           | $f\sigma_8(0.38)$           | $0.477^{+0.013}_{-0.013}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $n_{\text{s},0.002}$                | $0.958^{+0.024}_{-0.024}$       | $\sigma_8(0.38)$            | $0.656^{+0.025}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2430^{+0.0077}_{-0.0079}$    | $f\sigma_8(0.51)$           | $0.474^{+0.013}_{-0.013}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2443^{+0.0077}_{-0.0079}$    | $\sigma_8(0.51)$            | $0.613^{+0.024}_{-0.024}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.60^{+0.14}_{-0.14}$          | $f\sigma_8(0.61)$           | $0.468^{+0.013}_{-0.013}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\text{Age}/\text{Gyr}$             | $14.00^{+0.60}_{-0.58}$         | $\sigma_8(0.61)$            | $0.583^{+0.024}_{-0.023}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                               | $1090.04^{+0.92}_{-0.90}$       | $f\sigma_8(2.33)$           | $0.294^{+0.013}_{-0.012}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                               | $146.0^{+5.2}_{-5.0}$           | $\sigma_8(2.33)$            | $0.302^{+0.014}_{-0.014}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                       | $1.0414^{+0.0014}_{-0.0014}$    | $f_{2000}^{143}$            | $30^{+7}_{-7}$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $14.02^{+0.48}_{-0.46}$         | $f_{2000}^{217}$            | $106.8^{+4.8}_{-4.8}$     |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1058.9^{+2.1}_{-2.2}$          | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$            |
| $H_0$                                | $65.9^{+4.4}_{-4.2}$            | $r_{\text{drag}}$                   | $148.8^{+5.4}_{-5.2}$           | $\chi_{\text{lensing}}^2$   | $9.33 (\nu: 0.5)$         |
| $\Omega_{\Lambda}$                   | $0.675^{+0.029}_{-0.031}$       | $k_{\text{D}}$                      | $0.1394^{+0.0037}_{-0.0037}$    | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.3)$        |
| $\Omega_{\text{m}}$                  | $0.325^{+0.031}_{-0.029}$       | $100\theta_{\text{D}}$              | $0.1607^{+0.0013}_{-0.0013}$    | $\chi_{\text{lowl}}^2$      | $24.5 (\nu: 2.1)$         |
| $\Omega_{\text{m}} h^2$              | $0.1408^{+0.0080}_{-0.0078}$    | $z_{\text{eq}}$                     | $3425^{+100}_{-100}$            | $\chi_{\text{CamSpec}}^2$   | $7062.7 (\nu: 14.4)$      |
| $\Omega_{\text{m}} h^3$              | $0.093^{+0.011}_{-0.010}$       | $k_{\text{eq}}$                     | $0.01034^{+0.00027}_{-0.00027}$ | $\chi_{\text{prior}}^2$     | $7.5 (\nu: 5.8)$          |
| $\sigma_8$                           | $0.804^{+0.026}_{-0.026}$       | $100\theta_{\text{eq}}$             | $0.808^{+0.020}_{-0.019}$       | $\chi_{\text{CMB}}^2$       | $7493.4 (\nu: 15.5)$      |
| $S_8$                                | $0.836^{+0.033}_{-0.033}$       | $100\theta_{\text{s,eq}}$           | $0.447^{+0.010}_{-0.0098}$      |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 7500.99; \Delta \bar{\chi}_{\text{eff}}^2 = 0.75; R - 1 = 0.00870$$



### 6.3 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_Cooke17\_Aver15

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02203^{+0.00052}_{-0.00052}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.609^{+0.023}_{-0.023}$       | $H(0.38)$                   | $81.8^{+3.1}_{-3.0}$         |
| $\Omega_{\text{c}}h^2$               | $0.1192^{+0.0059}_{-0.0058}$    | $\sigma_8/h^{0.5}$                 | $0.993^{+0.032}_{-0.032}$       | $D_{\text{M}}(0.38)$        | $1559^{+72}_{-69}$           |
| $100\theta_{\text{MC}}$              | $1.0410^{+0.0010}_{-0.00099}$   | $r_{\text{drag}}h$                 | $98.0^{+3.8}_{-3.8}$            | $H(0.51)$                   | $88.6^{+3.1}_{-3.0}$         |
| $\tau$                               | $0.051^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$        | $2.458^{+0.084}_{-0.082}$       | $D_{\text{M}}(0.51)$        | $2017^{+88}_{-86}$           |
| $N_{\text{eff}}$                     | $2.94^{+0.37}_{-0.37}$          | $z_{\text{re}}$                    | $7.4^{+1.6}_{-1.7}$             | $H(0.61)$                   | $94.2^{+3.0}_{-2.9}$         |
| $\ln(10^{10}A_{\text{s}})$           | $3.033^{+0.036}_{-0.036}$       | $10^9 A_{\text{s}}$                | $2.077^{+0.076}_{-0.074}$       | $D_{\text{M}}(0.61)$        | $2346^{+99}_{-96}$           |
| $n_{\text{s}}$                       | $0.959^{+0.020}_{-0.020}$       | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.874^{+0.035}_{-0.034}$       | $H(2.33)$                   | $235.3^{+5.0}_{-5.0}$        |
| $y_{\text{cal}}$                     | $1.0004^{+0.0050}_{-0.0049}$    | $D_{40}$                           | $1236^{+37}_{-37}$              | $D_{\text{M}}(2.33)$        | $5826^{+170}_{-170}$         |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{220}$                          | $5701^{+81}_{-81}$              | $f\sigma_8(0.15)$           | $0.463^{+0.025}_{-0.024}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                          | $2532^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.744^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{1420}$                         | $814.5^{+9.7}_{-9.9}$           | $f\sigma_8(0.38)$           | $0.479^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{2000}$                         | $230.0^{+3.7}_{-3.7}$           | $\sigma_8(0.38)$            | $0.658^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.47$                        | $n_{\text{s},0.002}$               | $0.959^{+0.020}_{-0.020}$       | $f\sigma_8(0.51)$           | $0.476^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.26}_{-0.25}$          | $Y_{\text{P}}$                     | $0.2438^{+0.0051}_{-0.0052}$    | $\sigma_8(0.51)$            | $0.616^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.2451^{+0.0051}_{-0.0053}$    | $f\sigma_8(0.61)$           | $0.470^{+0.014}_{-0.014}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$           | $2.611^{+0.095}_{-0.095}$       | $\sigma_8(0.61)$            | $0.585^{+0.017}_{-0.017}$    |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$            | $13.94^{+0.41}_{-0.40}$         | $f\sigma_8(2.33)$           | $0.2947^{+0.0093}_{-0.0089}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $z_*$                              | $1090.17^{+0.79}_{-0.78}$       | $\sigma_8(2.33)$            | $0.303^{+0.010}_{-0.0098}$   |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $r_*$                              | $145.5^{+3.4}_{-3.3}$           | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                      | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{217}$            | $107.1^{+4.2}_{-4.2}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.32}$          | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.97^{+0.32}_{-0.31}$         | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$                  | $1059.0^{+1.7}_{-1.6}$          | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.2)$           |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $r_{\text{drag}}$                  | $148.3^{+3.6}_{-3.5}$           | $\chi_{\text{lowl}}^2$      | $24.3 (\nu: 1.8)$            |
| $H_0$                                | $66.1^{+3.6}_{-3.4}$            | $k_{\text{D}}$                     | $0.1398^{+0.0026}_{-0.0026}$    | $\chi_{\text{CamSpec}}^2$   | $7062.8 (\nu: 14.8)$         |
| $\Omega_{\Lambda}$                   | $0.675^{+0.031}_{-0.034}$       | $100\theta_{\text{D}}$             | $0.16085^{+0.00087}_{-0.00087}$ | $\chi_{\text{Aver15}}^2$    | $0.45 (\nu: 0.2)$            |
| $\Omega_{\text{m}}$                  | $0.325^{+0.034}_{-0.031}$       | $z_{\text{eq}}$                    | $3426^{+110}_{-110}$            | $\chi_{\text{Cooke17}}^2$   | $0.28 (\nu: 0.1)$            |
| $\Omega_{\text{m}}h^2$               | $0.1419^{+0.0060}_{-0.0060}$    | $k_{\text{eq}}$                    | $0.01038^{+0.00030}_{-0.00029}$ | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 5.7)$             |
| $\Omega_{\text{m}}h^3$               | $0.0938^{+0.0074}_{-0.0071}$    | $100\theta_{\text{eq}}$            | $0.808^{+0.021}_{-0.021}$       | $\chi_{\text{CMB}}^2$       | $7484.0 (\nu: 14.7)$         |
| $\sigma_8$                           | $0.807^{+0.022}_{-0.021}$       | $100\theta_{\text{s,eq}}$          | $0.447^{+0.011}_{-0.011}$       | $\chi_{\text{Abund}}^2$     | $0.73 (\nu: 0.4)$            |
| $S_8$                                | $0.840^{+0.050}_{-0.047}$       | $H(0.15)$                          | $71.5^{+3.4}_{-3.3}$            |                             |                              |
| $\sigma_8\Omega_{\text{m}}^{0.5}$    | $0.460^{+0.027}_{-0.026}$       | $D_{\text{M}}(0.15)$               | $655^{+33}_{-32}$               |                             |                              |

$\bar{\chi}_{\text{eff}}^2 = 7492.26; R - 1 = 0.00836$



## 6.4 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02206^{+0.00062}_{-0.00061}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.460^{+0.027}_{-0.026}$       | $H(0.15)$                   | $71.7^{+4.7}_{-4.4}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1193^{+0.0082}_{-0.0078}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.610^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.15)$      | $653^{+44}_{-43}$         |
| $100\theta_{\mathrm{MC}}$                | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$                    | $0.993^{+0.032}_{-0.032}$       | $H(0.38)$                   | $82.0^{+4.5}_{-4.2}$      |
| $\tau$                                   | $0.053^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $98.2^{+4.4}_{-4.2}$            | $D_{\mathrm{M}}(0.38)$      | $1555^{+98}_{-95}$        |
| $N_{\mathrm{eff}}$                       | $2.96^{+0.59}_{-0.55}$          | $\langle d^2 \rangle^{1/2}$           | $2.458^{+0.091}_{-0.089}$       | $H(0.51)$                   | $88.7^{+4.5}_{-4.2}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.038^{+0.038}_{-0.033}$       | $z_{\mathrm{re}}$                     | $< 8.82$                        | $D_{\mathrm{M}}(0.51)$      | $2013^{+120}_{-120}$      |
| $n_{\mathrm{s}}$                         | $0.960^{+0.026}_{-0.026}$       | $10^9 A_{\mathrm{s}}$                 | $2.086^{+0.081}_{-0.069}$       | $H(0.61)$                   | $94.4^{+4.5}_{-4.2}$      |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0050}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.875^{+0.045}_{-0.046}$       | $D_{\mathrm{M}}(0.61)$      | $2340^{+140}_{-130}$      |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                              | $1234^{+44}_{-43}$              | $H(2.33)$                   | $235.5^{+7.3}_{-7.1}$     |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5702^{+81}_{-82}$              | $D_{\mathrm{M}}(2.33)$      | $5817^{+260}_{-250}$      |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2532^{+29}_{-28}$              | $f\sigma_8(0.15)$           | $0.463^{+0.025}_{-0.024}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+20}_{-10}$                | $D_{1420}$                            | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.746^{+0.026}_{-0.024}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.47$                        | $D_{2000}$                            | $230.0^{+4.5}_{-4.5}$           | $f\sigma_8(0.38)$           | $0.479^{+0.019}_{-0.019}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.960^{+0.026}_{-0.026}$       | $\sigma_8(0.38)$            | $0.660^{+0.024}_{-0.023}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2440^{+0.0079}_{-0.0079}$    | $f\sigma_8(0.51)$           | $0.476^{+0.017}_{-0.017}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2453^{+0.0079}_{-0.0079}$    | $\sigma_8(0.51)$            | $0.617^{+0.023}_{-0.022}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.61^{+0.14}_{-0.14}$          | $f\sigma_8(0.61)$           | $0.470^{+0.015}_{-0.015}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.92^{+0.61}_{-0.60}$         | $\sigma_8(0.61)$            | $0.587^{+0.023}_{-0.021}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.16^{+0.98}_{-0.97}$       | $f\sigma_8(2.33)$           | $0.296^{+0.012}_{-0.012}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $145.3^{+5.2}_{-5.0}$           | $\sigma_8(2.33)$            | $0.304^{+0.014}_{-0.013}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.31}$          | $100\theta_*$                         | $1.0412^{+0.0014}_{-0.0014}$    | $f_{2000}^{143}$            | $30^{+7}_{-7}$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.96^{+0.48}_{-0.46}$         | $f_{2000}^{217}$            | $107.1^{+4.9}_{-4.9}$     |
| $c_{217}$                                | $1.0012^{+0.0030}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.1^{+2.2}_{-2.2}$          | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$            |
| $H_0$                                    | $66.4^{+4.9}_{-4.5}$            | $r_{\mathrm{drag}}$                   | $148.1^{+5.4}_{-5.2}$           | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.3)$        |
| $\Omega_{\Lambda}$                       | $0.677^{+0.035}_{-0.038}$       | $k_{\mathrm{D}}$                      | $0.1399^{+0.0037}_{-0.0037}$    | $\chi_{\mathrm{lowl}}^2$    | $24.3 (\nu: 2.5)$         |
| $\Omega_{\mathrm{m}}$                    | $0.323^{+0.038}_{-0.035}$       | $100\theta_{\mathrm{D}}$              | $0.1609^{+0.0013}_{-0.0013}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7063.2 (\nu: 16.5)$      |
| $\Omega_{\mathrm{m}} h^2$                | $0.1420^{+0.0085}_{-0.0081}$    | $z_{\mathrm{eq}}$                     | $3420^{+130}_{-130}$            | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.8)$          |
| $\Omega_{\mathrm{m}} h^3$                | $0.094^{+0.011}_{-0.011}$       | $k_{\mathrm{eq}}$                     | $0.01037^{+0.00032}_{-0.00031}$ | $\chi_{\mathrm{CMB}}^2$     | $7484.3 (\nu: 15.2)$      |
| $\sigma_8$                               | $0.809^{+0.027}_{-0.026}$       | $100\theta_{\mathrm{eq}}$             | $0.810^{+0.025}_{-0.023}$       |                             |                           |
| $S_8$                                    | $0.839^{+0.050}_{-0.048}$       | $100\theta_{\mathrm{s,eq}}$           | $0.448^{+0.013}_{-0.012}$       |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7491.86; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.60; R - 1 = 0.00538$$



## 6.5 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02205^{+0.00058}_{-0.00058}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.458^{+0.018}_{-0.018}$       | $H(0.15)$                   | $71.5^{+4.2}_{-4.0}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1183^{+0.0076}_{-0.0075}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.017}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $655^{+41}_{-39}$         |
| $100\theta_{\mathrm{MC}}$                | $1.0411^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$                    | $0.991^{+0.021}_{-0.021}$       | $H(0.38)$                   | $81.7^{+4.1}_{-4.0}$      |
| $\tau$                                   | $0.053^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $98.3^{+3.5}_{-3.3}$            | $D_{\mathrm{M}}(0.38)$      | $1560^{+91}_{-86}$        |
| $N_{\mathrm{eff}}$                       | $2.91^{+0.56}_{-0.53}$          | $\langle d^2 \rangle^{1/2}$           | $2.456^{+0.062}_{-0.063}$       | $H(0.51)$                   | $88.4^{+4.1}_{-4.1}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.035^{+0.038}_{-0.033}$       | $z_{\mathrm{re}}$                     | $< 8.78$                        | $D_{\mathrm{M}}(0.51)$      | $2019^{+110}_{-110}$      |
| $n_{\mathrm{s}}$                         | $0.959^{+0.024}_{-0.024}$       | $10^9 A_{\mathrm{s}}$                 | $2.081^{+0.079}_{-0.068}$       | $H(0.61)$                   | $94.1^{+4.2}_{-4.1}$      |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.870^{+0.043}_{-0.044}$       | $D_{\mathrm{M}}(0.61)$      | $2348^{+130}_{-120}$      |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{40}$                              | $1236^{+37}_{-36}$              | $H(2.33)$                   | $234.6^{+7.0}_{-7.0}$     |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5705^{+81}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5837^{+250}_{-240}$      |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2532^{+28}_{-27}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.743^{+0.024}_{-0.024}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.54$                        | $D_{2000}$                            | $230.4^{+4.5}_{-4.4}$           | $f\sigma_8(0.38)$           | $0.477^{+0.013}_{-0.013}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.959^{+0.024}_{-0.024}$       | $\sigma_8(0.38)$            | $0.658^{+0.024}_{-0.023}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2433^{+0.0075}_{-0.0077}$    | $f\sigma_8(0.51)$           | $0.474^{+0.013}_{-0.012}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2446^{+0.0075}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.615^{+0.023}_{-0.022}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.60^{+0.14}_{-0.13}$          | $f\sigma_8(0.61)$           | $0.468^{+0.012}_{-0.012}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.97^{+0.60}_{-0.57}$         | $\sigma_8(0.61)$            | $0.585^{+0.022}_{-0.022}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.03^{+0.92}_{-0.89}$       | $f\sigma_8(2.33)$           | $0.295^{+0.012}_{-0.012}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $145.9^{+5.2}_{-4.9}$           | $\sigma_8(2.33)$            | $0.303^{+0.014}_{-0.013}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.31}$          | $100\theta_*$                         | $1.0414^{+0.0014}_{-0.0014}$    | $f_{2000}^{143}$            | $30^{+7}_{-7}$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $14.01^{+0.48}_{-0.45}$         | $f_{2000}^{217}$            | $106.8^{+4.8}_{-4.8}$     |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1058.9^{+2.1}_{-2.2}$          | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$            |
| $H_0$                                    | $66.1^{+4.3}_{-4.1}$            | $r_{\mathrm{drag}}$                   | $148.7^{+5.4}_{-5.1}$           | $\chi_{\mathrm{lensing}}^2$ | $9.34 (\nu: 0.5)$         |
| $\Omega_{\Lambda}$                       | $0.677^{+0.028}_{-0.029}$       | $k_{\mathrm{D}}$                      | $0.1395^{+0.0037}_{-0.0038}$    | $\chi_{\mathrm{simall}}^2$  | $396.7 (\nu: 1.3)$        |
| $\Omega_{\mathrm{m}}$                    | $0.323^{+0.029}_{-0.028}$       | $100\theta_{\mathrm{D}}$              | $0.1607^{+0.0013}_{-0.0013}$    | $\chi_{\mathrm{lowl}}^2$    | $24.3 (\nu: 1.9)$         |
| $\Omega_{\mathrm{m}} h^2$                | $0.1410^{+0.0079}_{-0.0079}$    | $z_{\mathrm{eq}}$                     | $3418^{+99}_{-100}$             | $\chi_{\mathrm{CamSpec}}^2$ | $7062.7 (\nu: 14.4)$      |
| $\Omega_{\mathrm{m}} h^3$                | $0.093^{+0.011}_{-0.010}$       | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00027}_{-0.00026}$ | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.8)$          |
| $\sigma_8$                               | $0.806^{+0.025}_{-0.024}$       | $100\theta_{\mathrm{eq}}$             | $0.810^{+0.019}_{-0.018}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.2 (\nu: 15.0)$      |
| $S_8$                                    | $0.835^{+0.033}_{-0.032}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4478^{+0.0097}_{-0.0092}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7500.70; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.69; R - 1 = 0.00702$$



## 6.6 base\_nnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_Cooke17\_Aver15\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02205^{+0.00052}_{-0.00052}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.610^{+0.023}_{-0.022}$       | $H(0.38)$                   | $81.9^{+3.1}_{-3.0}$         |
| $\Omega_c h^2$              | $0.1192^{+0.0058}_{-0.0058}$    | $\sigma_8/h^{0.5}$          | $0.994^{+0.032}_{-0.031}$       | $D_M(0.38)$                 | $1557^{+71}_{-69}$           |
| $100\theta_{MC}$            | $1.0410^{+0.0010}_{-0.0010}$    | $r_{drag}h$                 | $98.1^{+3.8}_{-3.8}$            | $H(0.51)$                   | $88.6^{+3.0}_{-2.9}$         |
| $\tau$                      | $0.053^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$ | $2.460^{+0.084}_{-0.080}$       | $D_M(0.51)$                 | $2014^{+87}_{-85}$           |
| $N_{eff}$                   | $2.95^{+0.37}_{-0.36}$          | $z_{re}$                    | $< 8.78$                        | $H(0.61)$                   | $94.3^{+3.0}_{-2.9}$         |
| $\ln(10^{10} A_s)$          | $3.037^{+0.031}_{-0.029}$       | $10^9 A_s$                  | $2.085^{+0.066}_{-0.061}$       | $D_M(0.61)$                 | $2342^{+98}_{-95}$           |
| $n_s$                       | $0.960^{+0.020}_{-0.019}$       | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.035}_{-0.035}$       | $H(2.33)$                   | $235.4^{+5.0}_{-5.0}$        |
| $y_{cal}$                   | $1.0004^{+0.0050}_{-0.0050}$    | $D_{40}$                    | $1235^{+37}_{-37}$              | $D_M(2.33)$                 | $5820^{+170}_{-170}$         |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $D_{220}$                   | $5701^{+81}_{-81}$              | $f\sigma_8(0.15)$           | $0.464^{+0.024}_{-0.023}$    |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{810}$                   | $2532^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.746^{+0.019}_{-0.018}$    |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{1420}$                  | $814.6^{+9.7}_{-9.9}$           | $f\sigma_8(0.38)$           | $0.479^{+0.018}_{-0.018}$    |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{2000}$                  | $230.1^{+3.7}_{-3.8}$           | $\sigma_8(0.38)$            | $0.660^{+0.018}_{-0.016}$    |
| $A_{143}^{tSZ}$             | $< 7.54$                        | $n_{s,0.002}$               | $0.960^{+0.020}_{-0.019}$       | $f\sigma_8(0.51)$           | $0.476^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{PS}$   | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | $0.2439^{+0.0051}_{-0.0052}$    | $\sigma_8(0.51)$            | $0.617^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.2452^{+0.0051}_{-0.0052}$    | $f\sigma_8(0.61)$           | $0.470^{+0.014}_{-0.014}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.612^{+0.096}_{-0.096}$       | $\sigma_8(0.61)$            | $0.587^{+0.016}_{-0.015}$    |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.93^{+0.41}_{-0.40}$         | $f\sigma_8(2.33)$           | $0.2954^{+0.0088}_{-0.0081}$ |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | $1090.16^{+0.78}_{-0.78}$       | $\sigma_8(2.33)$            | $0.3041^{+0.0098}_{-0.0090}$ |
| $A_{143}^{dust}$            | $0.97^{+0.34}_{-0.34}$          | $r_*$                       | $145.4^{+3.4}_{-3.3}$           | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{217}$            | $107.1^{+4.2}_{-4.2}$        |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.31}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.96^{+0.32}_{-0.31}$         | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1059.1^{+1.6}_{-1.6}$          | $\chi_{simall}^2$           | $396.7 (\nu: 1.2)$           |
| $c_{217}$                   | $1.0011^{+0.0030}_{-0.0029}$    | $r_{drag}$                  | $148.2^{+3.6}_{-3.5}$           | $\chi_{lowl}^2$             | $24.2 (\nu: 1.7)$            |
| $H_0$                       | $66.2^{+3.5}_{-3.4}$            | $k_D$                       | $0.1399^{+0.0026}_{-0.0026}$    | $\chi_{CamSpec}^2$          | $7062.7 (\nu: 14.7)$         |
| $\Omega_\Lambda$            | $0.676^{+0.030}_{-0.033}$       | $100\theta_D$               | $0.16086^{+0.00086}_{-0.00087}$ | $\chi_{Aver15}^2$           | $0.45 (\nu: 0.2)$            |
| $\Omega_m$                  | $0.324^{+0.033}_{-0.030}$       | $z_{eq}$                    | $3422^{+110}_{-110}$            | $\chi_{Cooke17}^2$          | $0.28 (\nu: 0.1)$            |
| $\Omega_m h^2$              | $0.1419^{+0.0060}_{-0.0060}$    | $k_{eq}$                    | $0.01037^{+0.00029}_{-0.00029}$ | $\chi_{prior}^2$            | $7.6 (\nu: 5.8)$             |
| $\Omega_m h^3$              | $0.0940^{+0.0074}_{-0.0071}$    | $100\theta_{eq}$            | $0.809^{+0.021}_{-0.021}$       | $\chi_{CMB}^2$              | $7483.7 (\nu: 14.1)$         |
| $\sigma_8$                  | $0.808^{+0.021}_{-0.020}$       | $100\theta_{s,eq}$          | $0.447^{+0.011}_{-0.011}$       | $\chi_{Abund}^2$            | $0.73 (\nu: 0.4)$            |
| $S_8$                       | $0.840^{+0.050}_{-0.046}$       | $H(0.15)$                   | $71.6^{+3.4}_{-3.2}$            |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.460^{+0.027}_{-0.025}$       | $D_M(0.15)$                 | $654^{+33}_{-32}$               |                             |                              |

$\bar{\chi}_{eff}^2 = 7491.99; R - 1 = 0.00722$



## 6.7 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022177 | $0.02220^{+0.00044}_{-0.00044}$ | $\sigma_8$                     | 0.8020   | $0.803^{+0.024}_{-0.023}$       | $100\theta_{\text{eq}}$     | 0.8118   | $0.812^{+0.015}_{-0.015}$    |
| $\Omega_c h^2$                       | 0.1174   | $0.1179^{+0.0068}_{-0.0065}$    | $S_8$                          | 0.8267   | $0.826^{+0.032}_{-0.032}$       | $100\theta_{\text{s,eq}}$   | 0.4487   | $0.4490^{+0.0076}_{-0.0075}$ |
| $100\theta_{\text{MC}}$              | 1.04112  | $1.04108^{+0.00096}_{-0.00090}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.4528   | $0.453^{+0.017}_{-0.017}$       | $H(0.15)$                   | 71.61    | $71.8^{+3.3}_{-3.1}$         |
| $\tau$                               | 0.0527   | $0.052^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$     | 0.6026   | $0.603^{+0.018}_{-0.018}$       | $D_{\text{M}}(0.15)$        | 653.2    | $651^{+31}_{-30}$            |
| $N_{\text{eff}}$                     | 2.885    | $2.92^{+0.45}_{-0.43}$          | $\sigma_8/h^{0.5}$             | 0.9848   | $0.984^{+0.023}_{-0.024}$       | $H(0.38)$                   | 81.74    | $82.0^{+3.2}_{-3.1}$         |
| $\ln(10^{10} A_s)$                   | 3.0322   | $3.032^{+0.038}_{-0.037}$       | $r_{\text{drag}} h$            | 98.70    | $98.8^{+2.7}_{-2.7}$            | $D_{\text{M}}(0.38)$        | 1556     | $1552^{+69}_{-67}$           |
| $n_s$                                | 0.9607   | $0.961^{+0.018}_{-0.019}$       | $\langle d^2 \rangle^{1/2}$    | 2.442    | $2.440^{+0.061}_{-0.061}$       | $H(0.51)$                   | 88.45    | $88.7^{+3.3}_{-3.2}$         |
| $y_{\text{cal}}$                     | 1.00022  | $1.0005^{+0.0048}_{-0.0049}$    | $z_{\text{re}}$                | 7.50     | $7.4^{+1.6}_{-1.7}$             | $D_{\text{M}}(0.51)$        | 2015     | $2009^{+86}_{-84}$           |
| $A_{100}^{\text{PS}}$                | 230.1    | $236^{+50}_{-50}$               | $10^9 A_s$                     | 2.074    | $2.074^{+0.080}_{-0.077}$       | $H(0.61)$                   | 94.07    | $94.3^{+3.3}_{-3.2}$         |
| $A_{143}^{\text{PS}}$                | 42.7     | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | 1.8666   | $1.869^{+0.038}_{-0.039}$       | $D_{\text{M}}(0.61)$        | 2343     | $2337^{+98}_{-96}$           |
| $A_{217}^{\text{PS}}$                | 105.0    | $103^{+20}_{-30}$               | $D_{40}$                       | 1230.9   | $1231^{+33}_{-31}$              | $H(2.33)$                   | 234.1    | $234.6^{+6.1}_{-6.0}$        |
| $A_{217}^{\text{CIB}}$               | 41.1     | $39^{+10}_{-10}$                | $D_{220}$                      | 5712     | $5715^{+74}_{-76}$              | $D_{\text{M}}(2.33)$        | 5836     | $5823^{+190}_{-190}$         |
| $A_{143}^{\text{tSZ}}$               | 5.90     | $< 7.56$                        | $D_{810}$                      | 2532.6   | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4568   | $0.457^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.687    | $0.66^{+0.25}_{-0.26}$          | $D_{1420}$                     | 816.9    | $816.4^{+9.9}_{-9.8}$           | $\sigma_8(0.15)$            | 0.7404   | $0.741^{+0.023}_{-0.022}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.75     | —                               | $D_{2000}$                     | 231.28   | $230.9^{+4.1}_{-4.0}$           | $f\sigma_8(0.38)$           | 0.4733   | $0.473^{+0.014}_{-0.014}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.51     | —                               | $n_{\text{s},0.002}$           | 0.9607   | $0.961^{+0.018}_{-0.019}$       | $\sigma_8(0.38)$            | 0.6555   | $0.656^{+0.021}_{-0.020}$    |
| $A^{\text{kSZ}}$                     | 0.8      | —                               | $Y_{\text{P}}$                 | 0.2431   | $0.2436^{+0.0061}_{-0.0061}$    | $f\sigma_8(0.51)$           | 0.4711   | $0.471^{+0.014}_{-0.013}$    |
| $A_{100}^{\text{dust}}$              | 1.017    | $1.01^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.2445   | $0.2449^{+0.0061}_{-0.0062}$    | $\sigma_8(0.51)$            | 0.6132   | $0.614^{+0.020}_{-0.020}$    |
| $A_{143}^{\text{dust}}$              | 0.973    | $0.96^{+0.35}_{-0.34}$          | $10^5 D/H$                     | 2.566    | $2.57^{+0.11}_{-0.11}$          | $f\sigma_8(0.61)$           | 0.4656   | $0.466^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{dust}}$              | 0.979    | $0.98^{+0.21}_{-0.20}$          | Age/Gyr                        | 13.970   | $13.94^{+0.46}_{-0.45}$         | $\sigma_8(0.61)$            | 0.5832   | $0.584^{+0.020}_{-0.019}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.011    | $1.02^{+0.32}_{-0.32}$          | $z_*$                          | 1089.77  | $1089.83^{+0.79}_{-0.79}$       | $f\sigma_8(2.33)$           | 0.2938   | $0.294^{+0.010}_{-0.010}$    |
| $c_{100}$                            | 0.99769  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                          | 146.09   | $145.8^{+4.2}_{-4.1}$           | $\sigma_8(2.33)$            | 0.3026   | $0.303^{+0.011}_{-0.011}$    |
| $c_{217}$                            | 1.00117  | $1.0011^{+0.0030}_{-0.0031}$    | $100\theta_*$                  | 1.04143  | $1.0414^{+0.0012}_{-0.0011}$    | $f_{2000}^{143}$            | 28.5     | $29^{+7}_{-7}$               |
| $c_{TE}$                             | 0.9956   | $0.996^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 14.028   | $14.00^{+0.39}_{-0.38}$         | $f_{2000}^{217}$            | 105.81   | $106.2^{+4.5}_{-4.4}$        |
| $c_{EE}$                             | 0.9902   | $0.991^{+0.011}_{-0.011}$       | $z_{\text{drag}}$              | 1059.17  | $1059.3^{+1.7}_{-1.6}$          | $f_{2000}^{143 \times 217}$ | 31.09    | $31^{+5}_{-5}$               |
| $H_0$                                | 66.32    | $66.5^{+3.3}_{-3.2}$            | $r_{\text{drag}}$              | 148.84   | $148.5^{+4.4}_{-4.3}$           | $\chi_{\text{small}}^2$     | 395.87   | $396.8 (\nu: 1.3)$           |
| $\Omega_{\Lambda}$                   | 0.6813   | $0.682^{+0.022}_{-0.023}$       | $k_{\text{D}}$                 | 0.13951  | $0.1397^{+0.0031}_{-0.0030}$    | $\chi_{\text{lowl}}^2$      | 23.68    | $23.8 (\nu: 1.1)$            |
| $\Omega_{\text{m}}$                  | 0.3187   | $0.318^{+0.023}_{-0.022}$       | $100\theta_{\text{D}}$         | 0.16053  | $0.1606^{+0.0010}_{-0.0010}$    | $\chi_{\text{CamSpec}}^2$   | 11498.6  | $11514.5 (\nu: 17.2)$        |
| $\Omega_{\text{m}} h^2$              | 0.1402   | $0.1407^{+0.0070}_{-0.0068}$    | $z_{\text{eq}}$                | 3408     | $3405^{+80}_{-78}$              | $\chi_{\text{prior}}^2$     | 2.1      | $7.9 (\nu: 5.9)$             |
| $\Omega_{\text{m}} h^3$              | 0.0930   | $0.0937^{+0.0088}_{-0.0083}$    | $k_{\text{eq}}$                | 0.010288 | $0.01030^{+0.00025}_{-0.00025}$ | $\chi_{\text{CMB}}^2$       | 11918.2  | $11935.2 (\nu: 17.3)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11920.27$ ;  $\Delta\chi_{\text{eff}}^2 = -0.49$ ;  $\bar{\chi}_{\text{eff}}^2 = 11943.05$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.59$ ;  $R - 1 = 0.00888$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 ( $\Delta$  -0.03) commander\_dx12\_v3\_2\_29: 23.68 ( $\Delta$  0.68) CamSpec like\_10.7HM\_1400\_unified: 11498.65 ( $\Delta$  -0.99)



## 6.8 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                       | $0.02217^{+0.00044}_{-0.00043}$ | $S_8$                       | $0.828^{+0.025}_{-0.025}$       | $H(0.15)$                   | $71.5^{+3.2}_{-3.0}$       |
| $\Omega_c h^2$                       | $0.1175^{+0.0066}_{-0.0063}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $654^{+30}_{-30}$          |
| $100\theta_{MC}$                     | $1.04113^{+0.00096}_{-0.00089}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.014}_{-0.014}$       | $H(0.38)$                   | $81.7^{+3.2}_{-3.0}$       |
| $\tau$                               | $0.053^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | $1558^{+66}_{-67}$         |
| $N_{\text{eff}}$                     | $2.88^{+0.44}_{-0.42}$          | $r_{\text{drag}} h$         | $98.6^{+2.5}_{-2.4}$            | $H(0.51)$                   | $88.4^{+3.3}_{-3.0}$       |
| $\ln(10^{10} A_s)$                   | $3.033^{+0.035}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | $2.447^{+0.049}_{-0.051}$       | $D_M(0.51)$                 | $2017^{+83}_{-84}$         |
| $n_s$                                | $0.960^{+0.018}_{-0.018}$       | $z_{\text{re}}$             | $7.5^{+1.5}_{-1.5}$             | $H(0.61)$                   | $94.0^{+3.3}_{-3.1}$       |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | $2.075^{+0.075}_{-0.071}$       | $D_M(0.61)$                 | $2346^{+94}_{-95}$         |
| $A_{100}^{\text{PS}}$                | $236^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.868^{+0.038}_{-0.037}$       | $H(2.33)$                   | $234.1^{+5.9}_{-5.8}$      |
| $A_{143}^{\text{PS}}$                | $37^{+20}_{-20}$                | $D_{40}$                    | $1235^{+31}_{-30}$              | $D_M(2.33)$                 | $5840^{+190}_{-190}$       |
| $A_{217}^{\text{PS}}$                | $104^{+20}_{-20}$               | $D_{220}$                   | $5718^{+76}_{-76}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$  |
| $A_{217}^{\text{CIB}}$               | $38^{+10}_{-10}$                | $D_{810}$                   | $2533^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.741^{+0.022}_{-0.020}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{1420}$                  | $816.8^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.474^{+0.011}_{-0.011}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.26}_{-0.26}$          | $D_{2000}$                  | $231.2^{+4.1}_{-4.0}$           | $\sigma_8(0.38)$            | $0.656^{+0.021}_{-0.019}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.960^{+0.018}_{-0.018}$       | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2431^{+0.0061}_{-0.0061}$    | $\sigma_8(0.51)$            | $0.613^{+0.020}_{-0.018}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2444^{+0.0061}_{-0.0061}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$  |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | $10^5 D/H$                  | $2.57^{+0.11}_{-0.11}$          | $\sigma_8(0.61)$            | $0.583^{+0.019}_{-0.018}$  |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.35}$          | Age/Gyr                     | $13.98^{+0.45}_{-0.46}$         | $f\sigma_8(2.33)$           | $0.294^{+0.010}_{-0.0095}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.79^{+0.77}_{-0.75}$       | $\sigma_8(2.33)$            | $0.303^{+0.011}_{-0.010}$  |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $r_*$                       | $146.1^{+4.2}_{-4.1}$           | $f_{2000}^{143}$            | $28^{+7}_{-6}$             |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.0414^{+0.0012}_{-0.0011}$    | $f_{2000}^{217}$            | $106.1^{+4.5}_{-4.3}$      |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $14.03^{+0.38}_{-0.38}$         | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$             |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0099}$      | $z_{\text{drag}}$           | $1059.1^{+1.7}_{-1.6}$          | $\chi_{\text{lensing}}^2$   | $9.08 (\nu: 0.3)$          |
| $c_{EE}$                             | $0.990^{+0.011}_{-0.011}$       | $r_{\text{drag}}$           | $148.9^{+4.3}_{-4.3}$           | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.1)$         |
| $H_0$                                | $66.2^{+3.3}_{-3.1}$            | $k_D$                       | $0.1395^{+0.0031}_{-0.0029}$    | $\chi_{\text{lowl}}^2$      | $24.1 (\nu: 1.1)$          |
| $\Omega_\Lambda$                     | $0.680^{+0.021}_{-0.021}$       | $100\theta_D$               | $0.1605^{+0.0010}_{-0.0010}$    | $\chi_{\text{CamSpec}}^2$   | $11513.8 (\nu: 16.5)$      |
| $\Omega_m$                           | $0.320^{+0.021}_{-0.021}$       | $z_{\text{eq}}$             | $3412^{+72}_{-72}$              | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.8)$           |
| $\Omega_m h^2$                       | $0.1403^{+0.0068}_{-0.0066}$    | $k_{\text{eq}}$             | $0.01030^{+0.00022}_{-0.00022}$ | $\chi_{\text{CMB}}^2$       | $11943.8 (\nu: 17.7)$      |
| $\Omega_m h^3$                       | $0.0930^{+0.0088}_{-0.0080}$    | $100\theta_{\text{eq}}$     | $0.811^{+0.014}_{-0.013}$       |                             |                            |
| $\sigma_8$                           | $0.802^{+0.022}_{-0.021}$       | $100\theta_{s,\text{eq}}$   | $0.4484^{+0.0070}_{-0.0068}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11951.65; \Delta\bar{\chi}_{\text{eff}}^2 = 0.20; R - 1 = 0.01144$$



## 6.9 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Cooke17\_Aver15

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02220^{+0.00040}_{-0.00039}$ | $S_8$                       | $0.827^{+0.031}_{-0.032}$       | $H(0.15)$                   | $72.0^{+2.6}_{-2.5}$         |
| $\Omega_c h^2$                       | $0.1183^{+0.0052}_{-0.0050}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | $650^{+24}_{-24}$            |
| $100\theta_{MC}$                     | $1.04103^{+0.00079}_{-0.00077}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.017}_{-0.017}$       | $H(0.38)$                   | $82.1^{+2.5}_{-2.4}$         |
| $\tau$                               | $0.052^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.985^{+0.023}_{-0.024}$       | $D_M(0.38)$                 | $1549^{+53}_{-54}$           |
| $N_{\text{eff}}$                     | $2.95^{+0.34}_{-0.32}$          | $r_{\text{drag}} h$         | $98.8^{+2.5}_{-2.4}$            | $H(0.51)$                   | $88.8^{+2.5}_{-2.4}$         |
| $\ln(10^{10} A_s)$                   | $3.033^{+0.035}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | $2.440^{+0.059}_{-0.059}$       | $D_M(0.51)$                 | $2005^{+66}_{-67}$           |
| $n_s$                                | $0.962^{+0.015}_{-0.015}$       | $z_{\text{re}}$             | $7.4^{+1.6}_{-1.7}$             | $H(0.61)$                   | $94.5^{+2.5}_{-2.4}$         |
| $y_{\text{cal}}$                     | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | $2.076^{+0.074}_{-0.072}$       | $D_M(0.61)$                 | $2333^{+75}_{-76}$           |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.032}_{-0.032}$       | $H(2.33)$                   | $234.9^{+4.6}_{-4.4}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1230^{+30}_{-29}$              | $D_M(2.33)$                 | $5813^{+150}_{-150}$         |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5714^{+75}_{-75}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2533^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.742^{+0.019}_{-0.019}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.54$                        | $D_{1420}$                  | $816.1^{+9.5}_{-9.6}$           | $f\sigma_8(0.38)$           | $0.474^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.7^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$            | $0.657^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.962^{+0.015}_{-0.015}$       | $f\sigma_8(0.51)$           | $0.472^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2439^{+0.0046}_{-0.0045}$    | $\sigma_8(0.51)$            | $0.615^{+0.017}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2453^{+0.0046}_{-0.0045}$    | $f\sigma_8(0.61)$           | $0.466^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.38}$          | $10^5 \text{D/H}$           | $2.583^{+0.083}_{-0.083}$       | $\sigma_8(0.61)$            | $0.585^{+0.016}_{-0.015}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $\text{Age/Gyr}$            | $13.91^{+0.34}_{-0.35}$         | $f\sigma_8(2.33)$           | $0.2947^{+0.0085}_{-0.0080}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $z_*$                       | $1089.89^{+0.65}_{-0.64}$       | $\sigma_8(2.33)$            | $0.3036^{+0.0092}_{-0.0087}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $145.5^{+3.1}_{-3.1}$           | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04129^{+0.00095}_{-0.00092}$ | $f_{2000}^{217}$            | $106.4^{+4.1}_{-4.1}$        |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0032}$    | $D_M(z_*)/\text{Gpc}$       | $13.98^{+0.28}_{-0.29}$         | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0098}$      | $z_{\text{drag}}$           | $1059.3^{+1.4}_{-1.3}$          | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.3)$           |
| $c_{EE}$                             | $0.991^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $148.3^{+3.2}_{-3.2}$           | $\chi_{\text{lowl}}^2$      | $23.7 (\nu: 0.9)$            |
| $H_0$                                | $66.7^{+2.7}_{-2.6}$            | $k_D$                       | $0.1399^{+0.0023}_{-0.0023}$    | $\chi_{\text{CamSpec}}^2$   | $11514.2 (\nu: 17.0)$        |
| $\Omega_\Lambda$                     | $0.682^{+0.020}_{-0.021}$       | $100\theta_D$               | $0.16068^{+0.00077}_{-0.00075}$ | $\chi_{\text{Aver15}}^2$    | $0.35 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.318^{+0.021}_{-0.020}$       | $z_{\text{eq}}$             | $3404^{+73}_{-71}$              | $\chi_{\text{Cooke17}}^2$   | $0.35 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1411^{+0.0053}_{-0.0051}$    | $k_{\text{eq}}$             | $0.01032^{+0.00021}_{-0.00021}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | $0.0941^{+0.0067}_{-0.0061}$    | $100\theta_{\text{eq}}$     | $0.813^{+0.014}_{-0.014}$       | $\chi_{\text{CMB}}^2$       | $11934.7 (\nu: 17.3)$        |
| $\sigma_8$                           | $0.804^{+0.021}_{-0.020}$       | $100\theta_{s,\text{eq}}$   | $0.4491^{+0.0069}_{-0.0069}$    | $\chi_{\text{Abund}}^2$     | $0.69 (\nu: 0.3)$            |

$$\bar{\chi}_{\text{eff}}^2 = 11943.28; R - 1 = 0.01315$$



## 6.10 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02221^{+0.00044}_{-0.00044}$ | $\sigma_8$                          | $0.804^{+0.023}_{-0.022}$       | $100\theta_{\text{eq}}$     | $0.813^{+0.015}_{-0.015}$    |
| $\Omega_c h^2$                       | $0.1179^{+0.0068}_{-0.0065}$    | $S_8$                               | $0.827^{+0.032}_{-0.032}$       | $100\theta_{\text{s,eq}}$   | $0.4492^{+0.0076}_{-0.0075}$ |
| $100\theta_{\text{MC}}$              | $1.04108^{+0.00096}_{-0.00090}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.453^{+0.017}_{-0.017}$       | $H(0.15)$                   | $71.9^{+3.3}_{-3.1}$         |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.604^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.15)$        | $651^{+31}_{-30}$            |
| $N_{\text{eff}}$                     | $2.93^{+0.44}_{-0.43}$          | $\sigma_8/h^{0.5}$                  | $0.985^{+0.023}_{-0.023}$       | $H(0.38)$                   | $82.1^{+3.2}_{-3.1}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.036^{+0.035}_{-0.030}$       | $r_{\text{drag}} h$                 | $98.9^{+2.7}_{-2.7}$            | $D_{\text{M}}(0.38)$        | $1550^{+69}_{-66}$           |
| $n_{\text{s}}$                       | $0.962^{+0.018}_{-0.019}$       | $\langle d^2 \rangle^{1/2}$         | $2.443^{+0.060}_{-0.059}$       | $H(0.51)$                   | $88.8^{+3.2}_{-3.1}$         |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0049}$    | $z_{\text{re}}$                     | $< 8.78$                        | $D_{\text{M}}(0.51)$        | $2007^{+86}_{-83}$           |
| $A_{100}^{\text{PS}}$                | $236^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | $2.082^{+0.071}_{-0.065}$       | $H(0.61)$                   | $94.4^{+3.3}_{-3.2}$         |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.869^{+0.039}_{-0.039}$       | $D_{\text{M}}(0.61)$        | $2335^{+97}_{-94}$           |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{40}$                            | $1231^{+33}_{-31}$              | $H(2.33)$                   | $234.6^{+6.0}_{-5.9}$        |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{220}$                           | $5715^{+75}_{-76}$              | $D_{\text{M}}(2.33)$        | $5819^{+190}_{-190}$         |
| $A_{143}^{\text{tSZ}}$               | $< 7.54$                        | $D_{810}$                           | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.26}$          | $D_{1420}$                          | $816^{+10}_{-9.7}$              | $\sigma_8(0.15)$            | $0.743^{+0.022}_{-0.021}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $D_{2000}$                          | $230.9^{+4.1}_{-4.0}$           | $f\sigma_8(0.38)$           | $0.474^{+0.014}_{-0.014}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $n_{\text{s},0.002}$                | $0.962^{+0.018}_{-0.019}$       | $\sigma_8(0.38)$            | $0.658^{+0.020}_{-0.019}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}$                      | $0.2437^{+0.0060}_{-0.0062}$    | $f\sigma_8(0.51)$           | $0.472^{+0.013}_{-0.013}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$         | $0.2450^{+0.0061}_{-0.0062}$    | $\sigma_8(0.51)$            | $0.615^{+0.020}_{-0.018}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $10^5 \text{D}/\text{H}$            | $2.58^{+0.11}_{-0.11}$          | $f\sigma_8(0.61)$           | $0.467^{+0.013}_{-0.012}$    |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $\text{Age}/\text{Gyr}$             | $13.93^{+0.46}_{-0.45}$         | $\sigma_8(0.61)$            | $0.585^{+0.019}_{-0.018}$    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $z_*$                               | $1089.83^{+0.79}_{-0.79}$       | $f\sigma_8(2.33)$           | $0.295^{+0.010}_{-0.0094}$   |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                               | $145.7^{+4.2}_{-4.1}$           | $\sigma_8(2.33)$            | $0.304^{+0.011}_{-0.010}$    |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$                       | $1.0414^{+0.0012}_{-0.0011}$    | $f_{2000}^{143}$            | $29^{+7}_{-7}$               |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.99^{+0.39}_{-0.38}$         | $f_{2000}^{217}$            | $106.2^{+4.5}_{-4.3}$        |
| $c_{EE}$                             | $0.991^{+0.011}_{-0.011}$       | $z_{\text{drag}}$                   | $1059.3^{+1.7}_{-1.6}$          | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$               |
| $H_0$                                | $66.6^{+3.3}_{-3.2}$            | $r_{\text{drag}}$                   | $148.5^{+4.3}_{-4.2}$           | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.3)$           |
| $\Omega_{\Lambda}$                   | $0.682^{+0.022}_{-0.023}$       | $k_{\text{D}}$                      | $0.1398^{+0.0030}_{-0.0030}$    | $\chi_{\text{lowl}}^2$      | $23.7 (\nu: 1.1)$            |
| $\Omega_{\text{m}}$                  | $0.318^{+0.023}_{-0.022}$       | $100\theta_{\text{D}}$              | $0.1606^{+0.0010}_{-0.0010}$    | $\chi_{\text{CamSpec}}^2$   | $11514.4 (\nu: 17.2)$        |
| $\Omega_{\text{m}} h^2$              | $0.1408^{+0.0070}_{-0.0068}$    | $z_{\text{eq}}$                     | $3403^{+79}_{-77}$              | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.8)$             |
| $\Omega_{\text{m}} h^3$              | $0.0938^{+0.0088}_{-0.0083}$    | $k_{\text{eq}}$                     | $0.01030^{+0.00025}_{-0.00025}$ | $\chi_{\text{CMB}}^2$       | $11934.9 (\nu: 17.1)$        |

$$\bar{\chi}_{\text{eff}}^2 = 11942.78; \Delta\bar{\chi}_{\text{eff}}^2 = 0.60; R - 1 = 0.01065$$



## 6.11 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02218^{+0.00043}_{-0.00043}$ | $S_8$                              | $0.828^{+0.025}_{-0.025}$       | $H(0.15)$                   | $71.6^{+3.2}_{-3.0}$       |
| $\Omega_{\text{c}}h^2$               | $0.1175^{+0.0066}_{-0.0063}$    | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.454^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.15)$        | $653^{+30}_{-30}$          |
| $100\theta_{\text{MC}}$              | $1.04113^{+0.00096}_{-0.00089}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.604^{+0.014}_{-0.014}$       | $H(0.38)$                   | $81.8^{+3.2}_{-3.0}$       |
| $\tau$                               | $0.054^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$                 | $0.987^{+0.018}_{-0.018}$       | $D_{\text{M}}(0.38)$        | $1556^{+66}_{-66}$         |
| $N_{\text{eff}}$                     | $2.89^{+0.44}_{-0.43}$          | $r_{\text{drag}}h$                 | $98.7^{+2.5}_{-2.3}$            | $H(0.51)$                   | $88.5^{+3.3}_{-3.1}$       |
| $\ln(10^{10}A_{\text{s}})$           | $3.035^{+0.033}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$        | $2.448^{+0.049}_{-0.050}$       | $D_{\text{M}}(0.51)$        | $2015^{+83}_{-83}$         |
| $n_{\text{s}}$                       | $0.960^{+0.018}_{-0.018}$       | $z_{\text{re}}$                    | $< 8.76$                        | $H(0.61)$                   | $94.1^{+3.3}_{-3.1}$       |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0048}$    | $10^9 A_{\text{s}}$                | $2.081^{+0.071}_{-0.059}$       | $D_{\text{M}}(0.61)$        | $2344^{+94}_{-95}$         |
| $A_{100}^{\text{PS}}$                | $236^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.868^{+0.038}_{-0.037}$       | $H(2.33)$                   | $234.2^{+6.0}_{-5.9}$      |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{40}$                           | $1234^{+31}_{-30}$              | $D_{\text{M}}(2.33)$        | $5836^{+190}_{-190}$       |
| $A_{217}^{\text{PS}}$                | $104^{+20}_{-20}$               | $D_{220}$                          | $5718^{+77}_{-76}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$  |
| $A_{217}^{\text{CIB}}$               | $38^{+10}_{-10}$                | $D_{810}$                          | $2533^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.742^{+0.021}_{-0.019}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                         | $816.8^{+9.9}_{-9.8}$           | $f\sigma_8(0.38)$           | $0.474^{+0.011}_{-0.011}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.26}_{-0.26}$          | $D_{2000}$                         | $231.2^{+4.1}_{-4.0}$           | $\sigma_8(0.38)$            | $0.657^{+0.020}_{-0.018}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$               | $0.960^{+0.018}_{-0.018}$       | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.011}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                     | $0.2432^{+0.0061}_{-0.0061}$    | $\sigma_8(0.51)$            | $0.614^{+0.019}_{-0.018}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.2445^{+0.0061}_{-0.0061}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$  |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | $10^5 \text{D}/\text{H}$           | $2.57^{+0.11}_{-0.11}$          | $\sigma_8(0.61)$            | $0.584^{+0.019}_{-0.017}$  |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.35}$          | $\text{Age}/\text{Gyr}$            | $13.97^{+0.46}_{-0.45}$         | $f\sigma_8(2.33)$           | $0.294^{+0.010}_{-0.0091}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                              | $1089.79^{+0.77}_{-0.76}$       | $\sigma_8(2.33)$            | $0.303^{+0.011}_{-0.010}$  |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.33}_{-0.32}$          | $r_*$                              | $146.1^{+4.1}_{-4.1}$           | $f_{2000}^{143}$            | $28^{+7}_{-6}$             |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$                      | $1.0414^{+0.0012}_{-0.0011}$    | $f_{2000}^{217}$            | $106.1^{+4.5}_{-4.3}$      |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $14.03^{+0.38}_{-0.38}$         | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$             |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0098}$      | $z_{\text{drag}}$                  | $1059.2^{+1.7}_{-1.6}$          | $\chi_{\text{lensing}}^2$   | $9.05 (\nu: 0.3)$          |
| $c_{EE}$                             | $0.990^{+0.011}_{-0.011}$       | $r_{\text{drag}}$                  | $148.8^{+4.3}_{-4.2}$           | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.2)$         |
| $H_0$                                | $66.3^{+3.3}_{-3.0}$            | $k_{\text{D}}$                     | $0.1396^{+0.0031}_{-0.0030}$    | $\chi_{\text{lowl}}^2$      | $24.0 (\nu: 1.1)$          |
| $\Omega_{\Lambda}$                   | $0.681^{+0.020}_{-0.020}$       | $100\theta_{\text{D}}$             | $0.1605^{+0.0010}_{-0.0010}$    | $\chi_{\text{CamSpec}}^2$   | $11513.8 (\nu: 16.4)$      |
| $\Omega_{\text{m}}$                  | $0.319^{+0.020}_{-0.020}$       | $z_{\text{eq}}$                    | $3409^{+70}_{-72}$              | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.9)$           |
| $\Omega_{\text{m}}h^2$               | $0.1403^{+0.0068}_{-0.0066}$    | $k_{\text{eq}}$                    | $0.01029^{+0.00022}_{-0.00022}$ | $\chi_{\text{CMB}}^2$       | $11943.5 (\nu: 17.3)$      |
| $\Omega_{\text{m}}h^3$               | $0.0931^{+0.0088}_{-0.0081}$    | $100\theta_{\text{eq}}$            | $0.812^{+0.014}_{-0.013}$       |                             |                            |
| $\sigma_8$                           | $0.803^{+0.022}_{-0.020}$       | $100\theta_{\text{s,eq}}$          | $0.4486^{+0.0069}_{-0.0066}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11951.41; \Delta\bar{\chi}_{\text{eff}}^2 = 0.16; R - 1 = 0.01353$$



## 6.12 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Cooke17\_Aver15\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02220^{+0.00040}_{-0.00039}$ | $S_8$                       | $0.828^{+0.031}_{-0.032}$       | $H(0.15)$                   | $72.0^{+2.6}_{-2.5}$         |
| $\Omega_c h^2$                       | $0.1183^{+0.0052}_{-0.0050}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | $650^{+24}_{-24}$            |
| $100\theta_{MC}$                     | $1.04103^{+0.00079}_{-0.00076}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.017}_{-0.017}$       | $H(0.38)$                   | $82.2^{+2.5}_{-2.4}$         |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.023}_{-0.022}$       | $D_M(0.38)$                 | $1548^{+53}_{-54}$           |
| $N_{\text{eff}}$                     | $2.95^{+0.33}_{-0.32}$          | $r_{\text{drag}} h$         | $98.9^{+2.5}_{-2.5}$            | $H(0.51)$                   | $88.9^{+2.5}_{-2.4}$         |
| $\ln(10^{10} A_s)$                   | $3.037^{+0.031}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$ | $2.443^{+0.057}_{-0.057}$       | $D_M(0.51)$                 | $2004^{+67}_{-67}$           |
| $n_s$                                | $0.962^{+0.015}_{-0.015}$       | $z_{\text{re}}$             | $< 8.80$                        | $H(0.61)$                   | $94.5^{+2.6}_{-2.4}$         |
| $y_{\text{cal}}$                     | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | $2.084^{+0.066}_{-0.059}$       | $D_M(0.61)$                 | $2331^{+75}_{-75}$           |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.032}_{-0.031}$       | $H(2.33)$                   | $235.0^{+4.5}_{-4.4}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1230^{+30}_{-29}$              | $D_M(2.33)$                 | $5810^{+140}_{-150}$         |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-20}$               | $D_{220}$                   | $5713^{+75}_{-75}$              | $f\sigma_8(0.15)$           | $0.458^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2533^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.744^{+0.019}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.50$                        | $D_{1420}$                  | $816.1^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.475^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.7^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$            | $0.659^{+0.017}_{-0.015}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.962^{+0.015}_{-0.015}$       | $f\sigma_8(0.51)$           | $0.473^{+0.012}_{-0.012}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2440^{+0.0046}_{-0.0045}$    | $\sigma_8(0.51)$            | $0.616^{+0.016}_{-0.015}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2453^{+0.0046}_{-0.0045}$    | $f\sigma_8(0.61)$           | $0.467^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.38}$          | $10^5 \text{D/H}$           | $2.584^{+0.084}_{-0.083}$       | $\sigma_8(0.61)$            | $0.586^{+0.016}_{-0.014}$    |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.35}$          | $\text{Age/Gyr}$            | $13.91^{+0.34}_{-0.34}$         | $f\sigma_8(2.33)$           | $0.2953^{+0.0082}_{-0.0073}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $z_*$                       | $1089.89^{+0.65}_{-0.64}$       | $\sigma_8(2.33)$            | $0.3042^{+0.0088}_{-0.0080}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $145.5^{+3.1}_{-3.1}$           | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04129^{+0.00095}_{-0.00091}$ | $f_{2000}^{217}$            | $106.4^{+4.2}_{-4.1}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0032}$    | $D_M(z_*)/\text{Gpc}$       | $13.97^{+0.29}_{-0.28}$         | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0098}$      | $z_{\text{drag}}$           | $1059.4^{+1.3}_{-1.3}$          | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.3)$           |
| $c_{EE}$                             | $0.991^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $148.2^{+3.2}_{-3.2}$           | $\chi_{\text{lowl}}^2$      | $23.6 (\nu: 0.9)$            |
| $H_0$                                | $66.7^{+2.7}_{-2.6}$            | $k_D$                       | $0.1399^{+0.0023}_{-0.0023}$    | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 17.0)$        |
| $\Omega_\Lambda$                     | $0.683^{+0.020}_{-0.021}$       | $100\theta_D$               | $0.16069^{+0.00077}_{-0.00075}$ | $\chi_{\text{Aver15}}^2$    | $0.35 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.317^{+0.021}_{-0.020}$       | $z_{\text{eq}}$             | $3402^{+72}_{-71}$              | $\chi_{\text{Cooke17}}^2$   | $0.35 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1412^{+0.0053}_{-0.0052}$    | $k_{\text{eq}}$             | $0.01032^{+0.00021}_{-0.00022}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | $0.0942^{+0.0067}_{-0.0062}$    | $100\theta_{\text{eq}}$     | $0.813^{+0.014}_{-0.014}$       | $\chi_{\text{CMB}}^2$       | $11934.5 (\nu: 16.9)$        |
| $\sigma_8$                           | $0.805^{+0.020}_{-0.018}$       | $100\theta_{s,\text{eq}}$   | $0.4493^{+0.0069}_{-0.0069}$    | $\chi_{\text{Abund}}^2$     | $0.70 (\nu: 0.3)$            |

$$\bar{\chi}_{\text{eff}}^2 = 11943.02; R - 1 = 0.01235$$



### 6.13 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022321 | $0.02231^{+0.00038}_{-0.00036}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4481   | $0.448^{+0.014}_{-0.014}$       | $H(0.38)$                   | 82.89    | $82.8^{+2.7}_{-2.6}$         |
| $\Omega_c h^2$                       | 0.1186   | $0.1182^{+0.0068}_{-0.0063}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6006   | $0.600^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | 1531     | $1534^{+54}_{-53}$           |
| $100\theta_{MC}$                     | 1.04099  | $1.04106^{+0.00092}_{-0.00092}$ | $\sigma_8/h^{0.5}$          | 0.9791   | $0.979^{+0.021}_{-0.021}$       | $H(0.51)$                   | 89.59    | $89.4^{+2.8}_{-2.7}$         |
| $\tau$                               | 0.0533   | $0.054^{+0.015}_{-0.015}$       | $r_{\text{drag}} h$         | 99.76    | $99.8^{+1.8}_{-1.7}$            | $D_M(0.51)$                 | 1983     | $1987^{+68}_{-67}$           |
| $N_{\text{eff}}$                     | 3.023    | $3.00^{+0.41}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$ | 2.423    | $2.423^{+0.049}_{-0.051}$       | $H(0.61)$                   | 95.18    | $95.0^{+2.9}_{-2.7}$         |
| $\ln(10^{10} A_s)$                   | 3.0368   | $3.036^{+0.036}_{-0.035}$       | $z_{\text{re}}$             | 7.57     | $7.6^{+1.5}_{-1.6}$             | $D_M(0.61)$                 | 2308     | $2312^{+78}_{-77}$           |
| $n_s$                                | 0.9667   | $0.966^{+0.015}_{-0.015}$       | $10^9 A_s$                  | 2.084    | $2.083^{+0.076}_{-0.073}$       | $H(2.33)$                   | 235.5    | $235.1^{+5.8}_{-5.6}$        |
| $y_{\text{cal}}$                     | 1.00020  | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8729   | $1.871^{+0.038}_{-0.038}$       | $D_M(2.33)$                 | 5772     | $5782^{+170}_{-170}$         |
| $A_{100}^{\text{PS}}$                | 233.9    | $238^{+50}_{-50}$               | $D_{40}$                    | 1222.9   | $1224^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4528   | $0.452^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | 45.4     | $38^{+20}_{-20}$                | $D_{220}$                   | 5718     | $5720^{+74}_{-75}$              | $\sigma_8(0.15)$            | 0.7439   | $0.743^{+0.022}_{-0.021}$    |
| $A_{217}^{\text{PS}}$                | 101.0    | $102^{+30}_{-30}$               | $D_{810}$                   | 2532.9   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4714   | $0.471^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | 43.3     | $39^{+10}_{-10}$                | $D_{1420}$                  | 815.8    | $816^{+10}_{-9.6}$              | $\sigma_8(0.38)$            | 0.6596   | $0.659^{+0.020}_{-0.020}$    |
| $A_{143}^{\text{tSZ}}$               | 5.94     | $< 7.54$                        | $D_{2000}$                  | 230.39   | $230.7^{+4.1}_{-4.0}$           | $f\sigma_8(0.51)$           | 0.4701   | $0.470^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.641    | $0.66^{+0.26}_{-0.26}$          | $n_{s,0.002}$               | 0.9667   | $0.966^{+0.015}_{-0.015}$       | $\sigma_8(0.51)$            | 0.6173   | $0.617^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.90     | —                               | $Y_{\text{P}}$              | 0.2451   | $0.2447^{+0.0055}_{-0.0054}$    | $f\sigma_8(0.61)$           | 0.4653   | $0.465^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.55     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2464   | $0.2460^{+0.0055}_{-0.0054}$    | $\sigma_8(0.61)$            | 0.5874   | $0.587^{+0.018}_{-0.018}$    |
| $A^{\text{kSZ}}$                     | 1.3      | —                               | $10^5 D/H$                  | 2.587    | $2.58^{+0.11}_{-0.11}$          | $f\sigma_8(2.33)$           | 0.2962   | $0.2959^{+0.0093}_{-0.0092}$ |
| $A_{100}^{\text{dust}}$              | 1.012    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.818   | $13.84^{+0.39}_{-0.40}$         | $\sigma_8(2.33)$            | 0.3055   | $0.305^{+0.010}_{-0.0098}$   |
| $A_{143}^{\text{dust}}$              | 0.998    | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | 1089.83  | $1089.79^{+0.81}_{-0.78}$       | $f_{2000}^{143}$            | 30.1     | $29^{+7}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.981    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 144.95   | $145.2^{+3.8}_{-3.8}$           | $f_{2000}^{217}$            | 106.63   | $106.5^{+4.4}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 0.974    | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04120  | $1.0413^{+0.0011}_{-0.0012}$    | $f_{2000}^{143 \times 217}$ | 31.93    | $32^{+5}_{-5}$               |
| $c_{100}$                            | 0.99766  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.922   | $13.95^{+0.35}_{-0.36}$         | $\chi_{\text{simall}}^2$    | 395.88   | $396.9 (\nu: 1.4)$           |
| $c_{217}$                            | 1.00145  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.70  | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\text{lowl}}^2$      | 22.86    | $23.0 (\nu: 0.6)$            |
| $c_{TE}$                             | 0.9966   | $0.997^{+0.010}_{-0.0099}$      | $r_{\text{drag}}$           | 147.64   | $147.9^{+3.9}_{-4.0}$           | $\chi_{\text{CamSpec}}^2$   | 11500.0  | $11515.3 (\nu: 17.7)$        |
| $c_{EE}$                             | 0.9922   | $0.992^{+0.011}_{-0.010}$       | $k_{\text{D}}$              | 0.14034  | $0.1402^{+0.0029}_{-0.0028}$    | $\chi_{6\text{DF}}^2$       | 0.022    | $0.056 (\nu: 0.0)$           |
| $H_0$                                | 67.57    | $67.5^{+2.6}_{-2.5}$            | $100\theta_{\text{D}}$      | 0.16079  | $0.16074^{+0.00097}_{-0.00094}$ | $\chi_{\text{MGS}}^2$       | 1.28     | $1.35 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                   | 0.6900   | $0.690^{+0.014}_{-0.014}$       | $z_{\text{eq}}$             | 3377     | $3378^{+52}_{-53}$              | $\chi_{\text{DR12BAO}}^2$   | 4.22     | $4.7 (\nu: 1.1)$             |
| $\Omega_{\text{m}}$                  | 0.3100   | $0.310^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | 0.010292 | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | 2.3      | $7.8 (\nu: 5.8)$             |
| $\Omega_{\text{m}} h^2$              | 0.1415   | $0.1411^{+0.0070}_{-0.0065}$    | $100\theta_{\text{eq}}$     | 0.8176   | $0.818^{+0.010}_{-0.0097}$      | $\chi_{\text{BAO}}^2$       | 5.52     | $6.1 (\nu: 0.7)$             |
| $\Omega_{\text{m}} h^3$              | 0.0956   | $0.0952^{+0.0081}_{-0.0074}$    | $100\theta_{\text{s,eq}}$   | 0.4517   | $0.4517^{+0.0052}_{-0.0049}$    | $\chi_{\text{CMB}}^2$       | 11918.7  | $11935.2 (\nu: 17.3)$        |
| $\sigma_8$                           | 0.8049   | $0.804^{+0.023}_{-0.023}$       | $H(0.15)$                   | 72.83    | $72.7^{+2.6}_{-2.5}$            |                             |          |                              |
| $S_8$                                | 0.8182   | $0.817^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | 641.7    | $643^{+24}_{-23}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11926.54$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.07$ ;  $\Delta\chi_{\text{eff}}^2 = 0.79$ ;  $R - 1 = 0.00571$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.02 MGS: 1.28 DR12BAO: 4.22 CMB - simall\_100x143\_offlike5\_EE\_Aplanck.B: 395.88 commander\_dx12\_v3\_2\_29: 22.86 CamSpec like\_10.7HM\_1400\_unified: 11499.97



## 6.14 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_JLA

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02230^{+0.00038}_{-0.00036}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.7^{+2.6}_{-2.5}$         |
| $\Omega_{\text{c}} h^2$              | $0.1181^{+0.0064}_{-0.0059}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.602^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1536^{+52}_{-50}$           |
| $100\theta_{\text{MC}}$              | $1.04108^{+0.00090}_{-0.00094}$ | $\sigma_8/h^{0.5}$                  | $0.982^{+0.016}_{-0.017}$       | $H(0.51)$                   | $89.3^{+2.7}_{-2.6}$         |
| $\tau$                               | $0.055^{+0.014}_{-0.014}$       | $r_{\text{drag}} h$                 | $99.6^{+1.6}_{-1.7}$            | $D_{\text{M}}(0.51)$        | $1990^{+65}_{-64}$           |
| $N_{\text{eff}}$                     | $2.99^{+0.39}_{-0.36}$          | $\langle d^2 \rangle^{1/2}$         | $2.432^{+0.042}_{-0.043}$       | $H(0.61)$                   | $94.9^{+2.7}_{-2.6}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.041^{+0.031}_{-0.032}$       | $z_{\text{re}}$                     | $7.7^{+1.4}_{-1.4}$             | $D_{\text{M}}(0.61)$        | $2316^{+74}_{-73}$           |
| $n_{\text{s}}$                       | $0.965^{+0.014}_{-0.014}$       | $10^9 A_{\text{s}}$                 | $2.092^{+0.066}_{-0.065}$       | $H(2.33)$                   | $235.1^{+5.6}_{-5.3}$        |
| $y_{\text{cal}}$                     | $1.0008^{+0.0049}_{-0.0048}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.873^{+0.035}_{-0.034}$       | $D_{\text{M}}(2.33)$        | $5788^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                            | $1227^{+27}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                           | $5726^{+72}_{-74}$              | $\sigma_8(0.15)$            | $0.745^{+0.019}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                           | $2536^{+28}_{-26}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                          | $817^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.660^{+0.017}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $4.0^{+3.5}_{-4.0}$             | $D_{2000}$                          | $231.0^{+4.2}_{-4.1}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $n_{\text{s},0.002}$                | $0.965^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | $0.618^{+0.016}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2446^{+0.0052}_{-0.0051}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2459^{+0.0053}_{-0.0051}$    | $\sigma_8(0.61)$            | $0.588^{+0.016}_{-0.017}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.58^{+0.11}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.2964^{+0.0082}_{-0.0086}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\text{Age}/\text{Gyr}$             | $13.86^{+0.38}_{-0.38}$         | $\sigma_8(2.33)$            | $0.3056^{+0.0089}_{-0.0092}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.33}$          | $z_*$                               | $1089.78^{+0.78}_{-0.74}$       | $f_{2000}^{143}$            | $29^{+7}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $145.3^{+3.6}_{-3.7}$           | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$                       | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.95^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | $9.29 (\nu: 0.4)$            |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.4)$           |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0097}$      | $r_{\text{drag}}$                   | $148.0^{+3.7}_{-3.8}$           | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.6)$            |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.0099}$      | $k_{\text{D}}$                      | $0.1401^{+0.0028}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | $11514.6 (\nu: 17.4)$        |
| $H_0$                                | $67.3^{+2.4}_{-2.4}$            | $100\theta_{\text{D}}$              | $0.16071^{+0.00094}_{-0.00087}$ | $\chi_{\text{JLA}}^2$       | $706.78 (\nu: 0.0)$          |
| $\Omega_{\Lambda}$                   | $0.689^{+0.013}_{-0.014}$       | $z_{\text{eq}}$                     | $3382^{+51}_{-48}$              | $\chi_{6\text{DF}}^2$       | $0.061 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.311^{+0.014}_{-0.013}$       | $k_{\text{eq}}$                     | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{MGS}}^2$       | $1.27 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | $0.1411^{+0.0066}_{-0.0061}$    | $100\theta_{\text{eq}}$             | $0.8168^{+0.0092}_{-0.0094}$    | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$             |
| $\Omega_{\text{m}} h^3$              | $0.0950^{+0.0076}_{-0.0071}$    | $100\theta_{\text{s,eq}}$           | $0.4513^{+0.0047}_{-0.0049}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.5)$             |
| $\sigma_8$                           | $0.806^{+0.020}_{-0.021}$       | $H(0.15)$                           | $72.6^{+2.5}_{-2.4}$            | $\chi_{\text{CMB}}^2$       | $11944.1 (\nu: 17.9)$        |
| $S_8$                                | $0.821^{+0.021}_{-0.022}$       | $D_{\text{M}}(0.15)$                | $644^{+23}_{-22}$               | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$             |

$$\bar{\chi}_{\text{eff}}^2 = 12664.75; R - 1 = 0.04059$$



## 6.15 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022296 | $0.02232^{+0.00037}_{-0.00036}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4488   | $0.449^{+0.012}_{-0.012}$       | $H(0.38)$                   | 82.61    | $82.8^{+2.5}_{-2.5}$         |
| $\Omega_c h^2$                       | 0.1179   | $0.1182^{+0.0064}_{-0.0060}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6009   | $0.602^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | 1536     | $1534^{+52}_{-49}$           |
| $100\theta_{MC}$                     | 1.04105  | $1.04106^{+0.00091}_{-0.00089}$ | $\sigma_8/h^{0.5}$          | 0.9809   | $0.982^{+0.017}_{-0.017}$       | $H(0.51)$                   | 89.29    | $89.4^{+2.6}_{-2.6}$         |
| $\tau$                               | 0.0546   | $0.056^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$         | 99.64    | $99.7^{+1.6}_{-1.6}$            | $D_M(0.51)$                 | 1990     | $1987^{+66}_{-62}$           |
| $N_{\text{eff}}$                     | 2.981    | $3.00^{+0.39}_{-0.37}$          | $\langle d^2 \rangle^{1/2}$ | 2.4288   | $2.431^{+0.041}_{-0.041}$       | $H(0.61)$                   | 94.88    | $95.0^{+2.7}_{-2.7}$         |
| $\ln(10^{10} A_s)$                   | 3.0388   | $3.042^{+0.032}_{-0.032}$       | $z_{\text{re}}$             | 7.69     | $7.8^{+1.4}_{-1.4}$             | $D_M(0.61)$                 | 2316     | $2312^{+75}_{-71}$           |
| $n_s$                                | 0.9657   | $0.966^{+0.014}_{-0.014}$       | $10^9 A_s$                  | 2.088    | $2.094^{+0.068}_{-0.066}$       | $H(2.33)$                   | 234.9    | $235.2^{+5.5}_{-5.4}$        |
| $y_{\text{cal}}$                     | 1.00064  | $1.0007^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8721   | $1.873^{+0.035}_{-0.035}$       | $D_M(2.33)$                 | 5789     | $5782^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | 231.1    | $238^{+50}_{-50}$               | $D_{40}$                    | 1225.3   | $1226^{+27}_{-25}$              | $f\sigma_8(0.15)$           | 0.4534   | $0.454^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | 41.8     | $38^{+20}_{-20}$                | $D_{220}$                   | 5723     | $5726^{+73}_{-74}$              | $\sigma_8(0.15)$            | 0.7436   | $0.745^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | 104.0    | $103^{+20}_{-30}$               | $D_{810}$                   | 2535.5   | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4717   | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | 42.9     | $39^{+10}_{-10}$                | $D_{1420}$                  | 817.3    | $817^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | 0.6592   | $0.661^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | 6.57     | $< 7.54$                        | $D_{2000}$                  | 231.05   | $230.9^{+4.0}_{-3.9}$           | $f\sigma_8(0.51)$           | 0.4704   | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.650    | $0.66^{+0.27}_{-0.27}$          | $n_{s,0.002}$               | 0.9657   | $0.966^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | 0.6169   | $0.618^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.80     | —                               | $Y_{\text{P}}$              | 0.2445   | $0.2447^{+0.0052}_{-0.0052}$    | $f\sigma_8(0.61)$           | 0.4655   | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.33     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2458   | $0.2460^{+0.0052}_{-0.0053}$    | $\sigma_8(0.61)$            | 0.5870   | $0.588^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.577    | $2.58^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | 0.2960   | $0.2967^{+0.0085}_{-0.0086}$ |
| $A_{100}^{\text{dust}}$              | 1.008    | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                     | 13.860   | $13.84^{+0.38}_{-0.37}$         | $\sigma_8(2.33)$            | 0.3052   | $0.3059^{+0.0091}_{-0.0092}$ |
| $A_{143}^{\text{dust}}$              | 0.968    | $0.95^{+0.34}_{-0.33}$          | $z_*$                       | 1089.77  | $1089.78^{+0.76}_{-0.74}$       | $f_{2000}^{143}$            | 29.1     | $29^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.975    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 145.35   | $145.2^{+3.7}_{-3.6}$           | $f_{2000}^{217}$            | 106.27   | $106.5^{+4.4}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 1.002    | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04129  | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | 31.47    | $32^{+5}_{-5}$               |
| $c_{100}$                            | 0.99776  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.959   | $13.94^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | 8.94     | $9.32 (\nu: 0.4)$            |
| $c_{217}$                            | 1.00120  | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\text{drag}}$           | 1059.55  | $1059.6^{+1.4}_{-1.4}$          | $\chi_{\text{small}}^2$     | 396.09   | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                             | 0.9964   | $0.996^{+0.010}_{-0.0099}$      | $r_{\text{drag}}$           | 148.05   | $147.9^{+3.8}_{-3.8}$           | $\chi_{\text{lowl}}^2$      | 23.00    | $23.1 (\nu: 0.6)$            |
| $c_{EE}$                             | 0.9918   | $0.992^{+0.011}_{-0.010}$       | $k_{\text{D}}$              | 0.14005  | $0.1402^{+0.0027}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | 11499.7  | $11514.7 (\nu: 16.7)$        |
| $H_0$                                | 67.30    | $67.5^{+2.4}_{-2.4}$            | $100\theta_{\text{D}}$      | 0.16070  | $0.16073^{+0.00092}_{-0.00090}$ | $\chi_{\text{JLA}}^2$       | 1035.03  | $1035.09 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                   | 0.6890   | $0.690^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | 3380.9   | $3379^{+48}_{-48}$              | $\chi_{6\text{DF}}^2$       | 0.030    | $0.053 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | 0.3110   | $0.310^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | 0.010274 | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{MGS}}^2$       | 1.22     | $1.32 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | 0.1409   | $0.1412^{+0.0065}_{-0.0062}$    | $100\theta_{\text{eq}}$     | 0.8170   | $0.8174^{+0.0091}_{-0.0089}$    | $\chi_{\text{DR12BAO}}^2$   | 4.39     | $4.7 (\nu: 1.0)$             |
| $\Omega_{\text{m}} h^3$              | 0.0948   | $0.0953^{+0.0076}_{-0.0072}$    | $100\theta_{\text{s,eq}}$   | 0.45136  | $0.4516^{+0.0046}_{-0.0046}$    | $\chi_{\text{prior}}^2$     | 2.0      | $7.7 (\nu: 5.8)$             |
| $\sigma_8$                           | 0.8047   | $0.806^{+0.020}_{-0.020}$       | $H(0.15)$                   | 72.55    | $72.7^{+2.4}_{-2.4}$            | $\chi_{\text{CMB}}^2$       | 11927.7  | $11944.3 (\nu: 17.6)$        |
| $S_8$                                | 0.8194   | $0.820^{+0.021}_{-0.022}$       | $D_M(0.15)$                 | 644.2    | $643^{+23}_{-21}$               | $\chi_{\text{BAO}}^2$       | 5.64     | $6.1 (\nu: 0.6)$             |

Best-fit  $\chi_{\text{eff}}^2 = 12970.39$ ;  $\Delta\chi_{\text{eff}}^2 = -0.10$ ;  $\bar{\chi}_{\text{eff}}^2 = 12993.15$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.76$ ;  $R - 1 = 0.01037$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.03 ( $\Delta$  0.01) MGS: 1.22 ( $\Delta$  -0.06) DR12BAO: 4.39 ( $\Delta$  0.16) CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p-teb\_consext8: 8.94 ( $\Delta$  -0.03) simall\_100x143\_offlike5\_EE\_Aplanck 396.09 ( $\Delta$  0.04) commander\_dx12\_v3\_2.29: 23.00 ( $\Delta$  0.23) CamSpec like\_10.7HM\_1400\_unified: 11499.66 ( $\Delta$  -0.52) SN - JLA Pantheon18: 1035.03 ( $\Delta$  0.05)



## 6.16 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02230^{+0.00038}_{-0.00037}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.450^{+0.011}_{-0.012}$       | $H(0.38)$                   | $82.6^{+2.6}_{-2.6}$         |
| $\Omega_{\text{c}} h^2$              | $0.1180^{+0.0064}_{-0.0060}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.602^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1537^{+54}_{-51}$           |
| $100\theta_{\text{MC}}$              | $1.04108^{+0.00091}_{-0.00090}$ | $\sigma_8/h^{0.5}$                  | $0.982^{+0.017}_{-0.017}$       | $H(0.51)$                   | $89.3^{+2.7}_{-2.6}$         |
| $\tau$                               | $0.055^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$                 | $99.6^{+1.7}_{-1.7}$            | $D_{\text{M}}(0.51)$        | $1991^{+68}_{-64}$           |
| $N_{\text{eff}}$                     | $2.98^{+0.39}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$         | $2.433^{+0.041}_{-0.042}$       | $H(0.61)$                   | $94.9^{+2.7}_{-2.7}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.040^{+0.033}_{-0.032}$       | $z_{\text{re}}$                     | $7.8^{+1.4}_{-1.4}$             | $D_{\text{M}}(0.61)$        | $2317^{+77}_{-73}$           |
| $n_{\text{s}}$                       | $0.965^{+0.014}_{-0.014}$       | $10^9 A_{\text{s}}$                 | $2.092^{+0.069}_{-0.066}$       | $H(2.33)$                   | $235.0^{+5.6}_{-5.4}$        |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.872^{+0.036}_{-0.036}$       | $D_{\text{M}}(2.33)$        | $5791^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                            | $1227^{+27}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                           | $5725^{+73}_{-74}$              | $\sigma_8(0.15)$            | $0.744^{+0.019}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                           | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                          | $817^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.660^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.56$                        | $D_{2000}$                          | $230.9^{+4.0}_{-3.9}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $n_{\text{s},0.002}$                | $0.965^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | $0.617^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2445^{+0.0053}_{-0.0053}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2458^{+0.0053}_{-0.0053}$    | $\sigma_8(0.61)$            | $0.588^{+0.017}_{-0.017}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.58^{+0.11}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.2962^{+0.0086}_{-0.0087}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.86^{+0.39}_{-0.38}$         | $\sigma_8(2.33)$            | $0.3054^{+0.0093}_{-0.0092}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.33}$          | $z_*$                               | $1089.78^{+0.76}_{-0.75}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $145.4^{+3.7}_{-3.7}$           | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.5}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$                       | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.96^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | $9.27 (\nu: 0.4)$            |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.6^{+1.4}_{-1.4}$          | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0099}$      | $r_{\text{drag}}$                   | $148.1^{+3.9}_{-3.8}$           | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.6)$            |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.010}$       | $k_{\text{D}}$                      | $0.1401^{+0.0028}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | $11514.5 (\nu: 16.7)$        |
| $H_0$                                | $67.3^{+2.5}_{-2.5}$            | $100\theta_{\text{D}}$              | $0.16070^{+0.00093}_{-0.00091}$ | $\chi_{6\text{DF}}^2$       | $0.065 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.688^{+0.014}_{-0.014}$       | $z_{\text{eq}}$                     | $3383^{+49}_{-50}$              | $\chi_{\text{MGS}}^2$       | $1.25 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.312^{+0.014}_{-0.014}$       | $k_{\text{eq}}$                     | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{DR12BAO}}^2$   | $5.0 (\nu: 1.3)$             |
| $\Omega_{\text{m}} h^2$              | $0.1410^{+0.0066}_{-0.0062}$    | $100\theta_{\text{eq}}$             | $0.8166^{+0.0096}_{-0.0093}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^3$              | $0.0949^{+0.0077}_{-0.0073}$    | $100\theta_{\text{s,eq}}$           | $0.4512^{+0.0049}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11944.1 (\nu: 17.6)$        |
| $\sigma_8$                           | $0.805^{+0.021}_{-0.021}$       | $H(0.15)$                           | $72.5^{+2.5}_{-2.5}$            | $\chi_{\text{BAO}}^2$       | $6.3 (\nu: 0.8)$             |
| $S_8$                                | $0.821^{+0.021}_{-0.022}$       | $D_{\text{M}}(0.15)$                | $645^{+24}_{-22}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11958.08; \Delta\bar{\chi}_{\text{eff}}^2 = 0.68; R - 1 = 0.01000$$



## 6.17 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Aver15

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02229^{+0.00035}_{-0.00034}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.447^{+0.014}_{-0.014}$       | $H(0.38)$                   | $82.6^{+2.2}_{-2.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1177^{+0.0056}_{-0.0053}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.599^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$      | $1537^{+45}_{-44}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04111^{+0.00083}_{-0.00083}$ | $\sigma_8/h^{0.5}$                    | $0.978^{+0.020}_{-0.021}$       | $H(0.51)$                   | $89.2^{+2.3}_{-2.2}$         |
| $\tau$                                   | $0.054^{+0.015}_{-0.015}$       | $r_{\mathrm{drag}} h$                 | $99.7^{+1.7}_{-1.6}$            | $D_{\mathrm{M}}(0.51)$      | $1992^{+57}_{-56}$           |
| $N_{\mathrm{eff}}$                       | $2.97^{+0.33}_{-0.32}$          | $\langle d^2 \rangle^{1/2}$           | $2.424^{+0.049}_{-0.050}$       | $H(0.61)$                   | $94.8^{+2.3}_{-2.3}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.035^{+0.035}_{-0.035}$       | $z_{\mathrm{re}}$                     | $7.6^{+1.5}_{-1.6}$             | $D_{\mathrm{M}}(0.61)$      | $2318^{+65}_{-64}$           |
| $n_{\mathrm{s}}$                         | $0.965^{+0.013}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.081^{+0.074}_{-0.071}$       | $H(2.33)$                   | $234.7^{+4.9}_{-4.6}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.869^{+0.033}_{-0.033}$       | $D_{\mathrm{M}}(2.33)$      | $5794^{+140}_{-140}$         |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{40}$                              | $1225^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.452^{+0.013}_{-0.014}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                             | $5720^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.742^{+0.019}_{-0.019}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+20}_{-30}$               | $D_{810}$                             | $2533^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.470^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $817^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.658^{+0.017}_{-0.017}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.60$                        | $D_{2000}$                            | $230.9^{+3.8}_{-3.7}$           | $f\sigma_8(0.51)$           | $0.469^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.27}_{-0.27}$          | $n_{\mathrm{s},0.002}$                | $0.965^{+0.013}_{-0.013}$       | $\sigma_8(0.51)$            | $0.615^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2443^{+0.0045}_{-0.0044}$    | $f\sigma_8(0.61)$           | $0.464^{+0.012}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2456^{+0.0045}_{-0.0044}$    | $\sigma_8(0.61)$            | $0.586^{+0.016}_{-0.016}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.574^{+0.095}_{-0.092}$       | $f\sigma_8(2.33)$           | $0.2953^{+0.0081}_{-0.0081}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.87^{+0.33}_{-0.33}$         | $\sigma_8(2.33)$            | $0.3045^{+0.0087}_{-0.0086}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $z_*$                                 | $1089.74^{+0.70}_{-0.68}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                 | $145.5^{+3.2}_{-3.2}$           | $f_{2000}^{217}$            | $106.3^{+4.2}_{-4.2}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$                         | $1.0414^{+0.0010}_{-0.0010}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.97^{+0.29}_{-0.30}$         | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.5^{+1.2}_{-1.2}$          | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 0.5)$            |
| $c_{TE}$                                 | $0.9964^{+0.010}_{-0.0099}$     | $r_{\mathrm{drag}}$                   | $148.2^{+3.3}_{-3.3}$           | $\chi_{\mathrm{CamSpec}}^2$ | $11514.9 (\nu: 16.9)$        |
| $c_{EE}$                                 | $0.992^{+0.010}_{-0.010}$       | $k_{\mathrm{D}}$                      | $0.1399^{+0.0025}_{-0.0023}$    | $\chi_{\mathrm{Aver15}}^2$  | $0.36 (\nu: 0.1)$            |
| $H_0$                                    | $67.3^{+2.1}_{-2.1}$            | $100\theta_{\mathrm{D}}$              | $0.16068^{+0.00081}_{-0.00080}$ | $\chi_{6\mathrm{DF}}^2$     | $0.056 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.689^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3379^{+50}_{-49}$              | $\chi_{\mathrm{MGS}}^2$     | $1.32 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}$                    | $0.311^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01026^{+0.00022}_{-0.00021}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.1)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1406^{+0.0058}_{-0.0054}$    | $100\theta_{\mathrm{eq}}$             | $0.8173^{+0.0093}_{-0.0092}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0946^{+0.0066}_{-0.0061}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4515^{+0.0047}_{-0.0047}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |
| $\sigma_8$                               | $0.803^{+0.021}_{-0.021}$       | $H(0.15)$                             | $72.5^{+2.1}_{-2.1}$            | $\chi_{\mathrm{CMB}}^2$     | $11934.9 (\nu: 16.8)$        |
| $S_8$                                    | $0.817^{+0.025}_{-0.026}$       | $D_{\mathrm{M}}(0.15)$                | $645^{+20}_{-19}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.20; R - 1 = 0.00729$$



6.18 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02229^{+0.00035}_{-0.00034}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.015}_{-0.016}$       | $H(0.51)$                   | $89.4^{+2.2}_{-2.1}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1181^{+0.0052}_{-0.0050}$    | $\sigma_8/h^{0.5}$                    | $0.979^{+0.020}_{-0.021}$       | $D_{\mathrm{M}}(0.51)$      | $1988^{+54}_{-53}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04106^{+0.00080}_{-0.00078}$ | $r_{\mathrm{drag}} h$                 | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.0^{+2.2}_{-2.1}$         |
| $\tau$                                   | $0.053^{+0.015}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$           | $2.424^{+0.048}_{-0.050}$       | $D_{\mathrm{M}}(0.61)$      | $2314^{+62}_{-61}$           |
| $N_{\mathrm{eff}}$                       | $3.00^{+0.31}_{-0.29}$          | $z_{\mathrm{re}}$                     | $7.6^{+1.5}_{-1.6}$             | $H(2.33)$                   | $235.1^{+4.6}_{-4.4}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.036^{+0.035}_{-0.035}$       | $10^9 A_{\mathrm{s}}$                 | $2.082^{+0.073}_{-0.071}$       | $D_{\mathrm{M}}(2.33)$      | $5784^{+130}_{-130}$         |
| $n_{\mathrm{s}}$                         | $0.966^{+0.012}_{-0.012}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.871^{+0.032}_{-0.032}$       | $f\sigma_8(0.15)$           | $0.452^{+0.013}_{-0.014}$    |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0048}_{-0.0049}$    | $D_{40}$                              | $1224^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.743^{+0.019}_{-0.019}$    |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{220}$                             | $5719^{+74}_{-75}$              | $f\sigma_8(0.38)$           | $0.471^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{810}$                             | $2533^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.659^{+0.017}_{-0.017}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+20}_{-30}$               | $D_{1420}$                            | $816.2^{+9.6}_{-9.6}$           | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.012}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                            | $230.6^{+3.6}_{-3.5}$           | $\sigma_8(0.51)$            | $0.616^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.59$                        | $n_{\mathrm{s},0.002}$                | $0.966^{+0.012}_{-0.012}$       | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.27}_{-0.27}$          | $Y_{\mathrm{P}}$                      | $0.2447^{+0.0042}_{-0.0041}$    | $\sigma_8(0.61)$            | $0.587^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2460^{+0.0042}_{-0.0042}$    | $f\sigma_8(2.33)$           | $0.2958^{+0.0078}_{-0.0078}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.583^{+0.084}_{-0.084}$       | $\sigma_8(2.33)$            | $0.3050^{+0.0084}_{-0.0082}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.85^{+0.31}_{-0.31}$         | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $z_*$                                 | $1089.80^{+0.63}_{-0.63}$       | $f_{2000}^{217}$            | $106.5^{+4.1}_{-4.1}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $r_*$                                 | $145.3^{+3.0}_{-3.0}$           | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04128^{+0.00095}_{-0.00094}$ | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.3)$           |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.95^{+0.27}_{-0.28}$         | $\chi_{\mathrm{lowl}}^2$    | $23.00 (\nu: 0.5)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.6^{+1.2}_{-1.2}$          | $\chi_{\mathrm{CamSpec}}^2$ | $11514.9 (\nu: 16.8)$        |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $148.0^{+3.1}_{-3.1}$           | $\chi_{\mathrm{Aver15}}^2$  | $0.36 (\nu: 0.1)$            |
| $c_{TE}$                                 | $0.9966^{+0.010}_{-0.0098}$     | $k_{\mathrm{D}}$                      | $0.1401^{+0.0023}_{-0.0022}$    | $\chi_{\mathrm{Cooke17}}^2$ | $0.35 (\nu: 0.1)$            |
| $c_{EE}$                                 | $0.992^{+0.010}_{-0.010}$       | $100\theta_{\mathrm{D}}$              | $0.16075^{+0.00072}_{-0.00072}$ | $\chi_{6\mathrm{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $H_0$                                    | $67.4^{+2.1}_{-2.0}$            | $z_{\mathrm{eq}}$                     | $3378^{+49}_{-48}$              | $\chi_{\mathrm{MGS}}^2$     | $1.32 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.013}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01027^{+0.00021}_{-0.00020}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.1)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.014}_{-0.013}$       | $100\theta_{\mathrm{eq}}$             | $0.8175^{+0.0092}_{-0.0092}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1410^{+0.0054}_{-0.0051}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4516^{+0.0047}_{-0.0047}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0951^{+0.0062}_{-0.0058}$    | $H(0.15)$                             | $72.7^{+2.1}_{-2.0}$            | $\chi_{\mathrm{CMB}}^2$     | $11934.8 (\nu: 16.6)$        |
| $\sigma_8$                               | $0.804^{+0.020}_{-0.020}$       | $D_{\mathrm{M}}(0.15)$                | $643^{+19}_{-19}$               | $\chi_{\mathrm{Abund}}^2$   | $0.71 (\nu: 0.2)$            |
| $S_8$                                    | $0.818^{+0.024}_{-0.026}$       | $H(0.38)$                             | $82.7^{+2.1}_{-2.0}$            |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.448^{+0.013}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$                | $1535^{+43}_{-42}$              |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.40; R - 1 = 0.00827$$



# 6.19 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02231^{+0.00038}_{-0.00036}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.448^{+0.014}_{-0.014}$       | $H(0.38)$                   | $82.8^{+2.7}_{-2.6}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1182^{+0.0068}_{-0.0063}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.601^{+0.017}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$      | $1533^{+54}_{-53}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04106^{+0.00093}_{-0.00092}$ | $\sigma_8/h^{0.5}$                    | $0.980^{+0.020}_{-0.019}$       | $H(0.51)$                   | $89.5^{+2.8}_{-2.7}$         |
| $\tau$                                   | $0.055^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.8}_{-1.7}$            | $D_{\mathrm{M}}(0.51)$      | $1986^{+68}_{-67}$           |
| $N_{\mathrm{eff}}$                       | $3.00^{+0.41}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$           | $2.426^{+0.048}_{-0.047}$       | $H(0.61)$                   | $95.1^{+2.9}_{-2.7}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.039^{+0.033}_{-0.031}$       | $z_{\mathrm{re}}$                     | $< 8.87$                        | $D_{\mathrm{M}}(0.61)$      | $2312^{+78}_{-77}$           |
| $n_{\mathrm{s}}$                         | $0.966^{+0.015}_{-0.015}$       | $10^9 A_{\mathrm{s}}$                 | $2.089^{+0.069}_{-0.065}$       | $H(2.33)$                   | $235.1^{+5.8}_{-5.6}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.871^{+0.038}_{-0.038}$       | $D_{\mathrm{M}}(2.33)$      | $5781^{+170}_{-170}$         |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{40}$                              | $1224^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.453^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                             | $5720^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.744^{+0.021}_{-0.020}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.471^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $816^{+10}_{-9.6}$              | $\sigma_8(0.38)$            | $0.660^{+0.019}_{-0.019}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.52$                        | $D_{2000}$                            | $230.7^{+4.1}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.470^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.966^{+0.015}_{-0.015}$       | $\sigma_8(0.51)$            | $0.617^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2448^{+0.0055}_{-0.0054}$    | $f\sigma_8(0.61)$           | $0.465^{+0.013}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2461^{+0.0055}_{-0.0054}$    | $\sigma_8(0.61)$            | $0.588^{+0.017}_{-0.017}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.58^{+0.11}_{-0.11}$          | $f\sigma_8(2.33)$           | $0.2963^{+0.0091}_{-0.0088}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.84^{+0.39}_{-0.40}$         | $\sigma_8(2.33)$            | $0.3056^{+0.0098}_{-0.0093}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $z_{*}$                               | $1089.78^{+0.81}_{-0.78}$       | $f_{2000}^{143}$            | $29^{+7}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_{*}$                               | $145.2^{+3.8}_{-3.8}$           | $f_{2000}^{217}$            | $106.5^{+4.5}_{-4.4}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.31}$          | $100\theta_{*}$                       | $1.0413^{+0.0012}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.94^{+0.35}_{-0.36}$         | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 0.6)$            |
| $c_{TE}$                                 | $0.996^{+0.010}_{-0.0098}$      | $r_{\mathrm{drag}}$                   | $147.9^{+3.9}_{-4.0}$           | $\chi_{\mathrm{CamSpec}}^2$ | $11515.1 (\nu: 17.5)$        |
| $c_{EE}$                                 | $0.992^{+0.011}_{-0.011}$       | $k_{\mathrm{D}}$                      | $0.1402^{+0.0029}_{-0.0028}$    | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $H_0$                                    | $67.5^{+2.6}_{-2.5}$            | $100\theta_{\mathrm{D}}$              | $0.16074^{+0.00097}_{-0.00094}$ | $\chi_{\mathrm{MGS}}^2$     | $1.36 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.014}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3377^{+52}_{-53}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.1)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1411^{+0.0069}_{-0.0065}$    | $100\theta_{\mathrm{eq}}$             | $0.818^{+0.010}_{-0.0097}$      | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0953^{+0.0081}_{-0.0074}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4518^{+0.0052}_{-0.0049}$    | $\chi_{\mathrm{CMB}}^2$     | $11935.0 (\nu: 17.0)$        |
| $\sigma_8$                               | $0.805^{+0.023}_{-0.022}$       | $H(0.15)$                             | $72.7^{+2.6}_{-2.5}$            |                             |                              |
| $S_8$                                    | $0.818^{+0.026}_{-0.026}$       | $D_{\mathrm{M}}(0.15)$                | $643^{+24}_{-23}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.82; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.83; R - 1 = 0.00628$$



## 6.20 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_JLA\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02231^{+0.00038}_{-0.00037}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.011}_{-0.012}$       | $H(0.38)$                   | $82.7^{+2.6}_{-2.5}$         |
| $\Omega_c h^2$                       | $0.1181^{+0.0064}_{-0.0058}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | $1536^{+52}_{-50}$           |
| $100\theta_{MC}$                     | $1.04108^{+0.00090}_{-0.00094}$ | $\sigma_8/h^{0.5}$          | $0.982^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.3^{+2.7}_{-2.6}$         |
| $\tau$                               | $0.056^{+0.012}_{-0.012}$       | $r_{\text{drag}} h$         | $99.7^{+1.6}_{-1.7}$            | $D_M(0.51)$                 | $1990^{+64}_{-63}$           |
| $N_{\text{eff}}$                     | $2.99^{+0.39}_{-0.36}$          | $\langle d^2 \rangle^{1/2}$ | $2.433^{+0.041}_{-0.041}$       | $H(0.61)$                   | $94.9^{+2.7}_{-2.7}$         |
| $\ln(10^{10} A_s)$                   | $3.042^{+0.031}_{-0.028}$       | $z_{\text{re}}$             | $7.8^{+1.1}_{-1.2}$             | $D_M(0.61)$                 | $2315^{+74}_{-73}$           |
| $n_s$                                | $0.966^{+0.014}_{-0.014}$       | $10^9 A_s$                  | $2.095^{+0.065}_{-0.058}$       | $H(2.33)$                   | $235.0^{+5.6}_{-5.4}$        |
| $y_{\text{cal}}$                     | $1.0008^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.035}_{-0.034}$       | $D_M(2.33)$                 | $5787^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $D_{40}$                    | $1227^{+27}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5725^{+72}_{-73}$              | $\sigma_8(0.15)$            | $0.745^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                   | $2536^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $817^{+11}_{-10}$               | $\sigma_8(0.38)$            | $0.660^{+0.017}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $D_{2000}$                  | $231.0^{+4.2}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $n_{s,0.002}$               | $0.966^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | $0.618^{+0.016}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2446^{+0.0052}_{-0.0052}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2459^{+0.0053}_{-0.0052}$    | $\sigma_8(0.61)$            | $0.588^{+0.015}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$    | $2.58^{+0.11}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.2966^{+0.0082}_{-0.0083}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.86^{+0.38}_{-0.38}$         | $\sigma_8(2.33)$            | $0.3058^{+0.0088}_{-0.0090}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.33}_{-0.33}$          | $z_*$                       | $1089.77^{+0.78}_{-0.75}$       | $f_{2000}^{143}$            | $29^{+7}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $145.3^{+3.6}_{-3.7}$           | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$               | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.95^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | $9.23 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.0097}$      | $r_{\text{drag}}$           | $148.0^{+3.8}_{-3.8}$           | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.6)$            |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.010}$       | $k_D$                       | $0.1401^{+0.0028}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | $11514.5 (\nu: 17.4)$        |
| $H_0$                                | $67.3^{+2.4}_{-2.4}$            | $100\theta_D$               | $0.16071^{+0.00094}_{-0.00087}$ | $\chi_{\text{JLA}}^2$       | $706.78 (\nu: 0.0)$          |
| $\Omega_\Lambda$                     | $0.689^{+0.013}_{-0.014}$       | $z_{\text{eq}}$             | $3382^{+50}_{-48}$              | $\chi_{6\text{DF}}^2$       | $0.059 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.311^{+0.014}_{-0.013}$       | $k_{\text{eq}}$             | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{MGS}}^2$       | $1.28 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1410^{+0.0066}_{-0.0060}$    | $100\theta_{\text{eq}}$     | $0.8169^{+0.0091}_{-0.0095}$    | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 1.2)$             |
| $\Omega_m h^3$                       | $0.0950^{+0.0076}_{-0.0072}$    | $100\theta_{s,\text{eq}}$   | $0.4513^{+0.0046}_{-0.0049}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.4)$             |
| $\sigma_8$                           | $0.806^{+0.020}_{-0.020}$       | $H(0.15)$                   | $72.6^{+2.4}_{-2.4}$            | $\chi_{\text{CMB}}^2$       | $11943.9 (\nu: 17.7)$        |
| $S_8$                                | $0.821^{+0.021}_{-0.022}$       | $D_M(0.15)$                 | $644^{+23}_{-22}$               | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$             |

$$\bar{\chi}_{\text{eff}}^2 = 12664.58; R - 1 = 0.04058$$



6.21 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02232^{+0.00037}_{-0.00036}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.8^{+2.5}_{-2.5}$         |
| $\Omega_{\text{c}} h^2$              | $0.1182^{+0.0064}_{-0.0060}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.602^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1534^{+52}_{-48}$           |
| $100\theta_{\text{MC}}$              | $1.04106^{+0.00092}_{-0.00089}$ | $\sigma_8/h^{0.5}$                  | $0.982^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.4^{+2.6}_{-2.6}$         |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$                 | $99.8^{+1.6}_{-1.6}$            | $D_{\text{M}}(0.51)$        | $1987^{+66}_{-62}$           |
| $N_{\text{eff}}$                     | $3.00^{+0.38}_{-0.37}$          | $\langle d^2 \rangle^{1/2}$         | $2.432^{+0.040}_{-0.040}$       | $H(0.61)$                   | $95.0^{+2.7}_{-2.7}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.043^{+0.031}_{-0.029}$       | $z_{\text{re}}$                     | $7.9^{+1.2}_{-1.3}$             | $D_{\text{M}}(0.61)$        | $2312^{+75}_{-71}$           |
| $n_{\text{s}}$                       | $0.966^{+0.014}_{-0.014}$       | $10^9 A_{\text{s}}$                 | $2.096^{+0.067}_{-0.060}$       | $H(2.33)$                   | $235.2^{+5.5}_{-5.4}$        |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.873^{+0.035}_{-0.035}$       | $D_{\text{M}}(2.33)$        | $5782^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                            | $1226^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                           | $5725^{+73}_{-74}$              | $\sigma_8(0.15)$            | $0.745^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                           | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                          | $817^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.661^{+0.018}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $D_{2000}$                          | $230.9^{+4.1}_{-3.9}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $n_{\text{s},0.002}$                | $0.966^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | $0.619^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2447^{+0.0052}_{-0.0052}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2461^{+0.0052}_{-0.0053}$    | $\sigma_8(0.61)$            | $0.589^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.58^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.2968^{+0.0084}_{-0.0083}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.84^{+0.38}_{-0.37}$         | $\sigma_8(2.33)$            | $0.3061^{+0.0090}_{-0.0090}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.33}$          | $z_*$                               | $1089.78^{+0.76}_{-0.74}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $145.2^{+3.7}_{-3.6}$           | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$                       | $1.0413^{+0.0011}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.94^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | $9.27 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.6^{+1.4}_{-1.4}$          | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                             | $0.9964^{+0.010}_{-0.0099}$     | $r_{\text{drag}}$                   | $147.9^{+3.8}_{-3.7}$           | $\chi_{\text{lowl}}^2$      | $23.1 (\nu: 0.6)$            |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.010}$       | $k_{\text{D}}$                      | $0.1402^{+0.0027}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | $11514.7 (\nu: 16.6)$        |
| $H_0$                                | $67.5^{+2.4}_{-2.4}$            | $100\theta_{\text{D}}$              | $0.16073^{+0.00092}_{-0.00090}$ | $\chi_{\text{JLA}}^2$       | $1035.09 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                   | $0.690^{+0.013}_{-0.013}$       | $z_{\text{eq}}$                     | $3379^{+48}_{-47}$              | $\chi_{6\text{DF}}^2$       | $0.051 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.310^{+0.013}_{-0.013}$       | $k_{\text{eq}}$                     | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{MGS}}^2$       | $1.33 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | $0.1412^{+0.0065}_{-0.0062}$    | $100\theta_{\text{eq}}$             | $0.8175^{+0.0091}_{-0.0090}$    | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 0.9)$             |
| $\Omega_{\text{m}} h^3$              | $0.0953^{+0.0076}_{-0.0072}$    | $100\theta_{\text{s,eq}}$           | $0.4516^{+0.0046}_{-0.0046}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.8)$             |
| $\sigma_8$                           | $0.807^{+0.020}_{-0.020}$       | $H(0.15)$                           | $72.7^{+2.4}_{-2.4}$            | $\chi_{\text{CMB}}^2$       | $11944.2 (\nu: 17.4)$        |
| $S_8$                                | $0.820^{+0.021}_{-0.021}$       | $D_{\text{M}}(0.15)$                | $643^{+23}_{-21}$               | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.6)$             |

$$\bar{\chi}_{\text{eff}}^2 = 12993.02; \Delta\bar{\chi}_{\text{eff}}^2 = 0.76; R - 1 = 0.01132$$



## 6.22 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02230^{+0.00038}_{-0.00036}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.450^{+0.011}_{-0.012}$       | $H(0.38)$                   | $82.6^{+2.6}_{-2.6}$         |
| $\Omega_{\text{c}} h^2$              | $0.1180^{+0.0064}_{-0.0060}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.602^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1537^{+54}_{-50}$           |
| $100\theta_{\text{MC}}$              | $1.04108^{+0.00091}_{-0.00090}$ | $\sigma_8/h^{0.5}$                  | $0.982^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.3^{+2.7}_{-2.6}$         |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$                 | $99.6^{+1.7}_{-1.7}$            | $D_{\text{M}}(0.51)$        | $1991^{+68}_{-64}$           |
| $N_{\text{eff}}$                     | $2.98^{+0.39}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$         | $2.434^{+0.041}_{-0.041}$       | $H(0.61)$                   | $94.9^{+2.7}_{-2.7}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.042^{+0.032}_{-0.029}$       | $z_{\text{re}}$                     | $7.8^{+1.1}_{-1.3}$             | $D_{\text{M}}(0.61)$        | $2317^{+77}_{-73}$           |
| $n_{\text{s}}$                       | $0.965^{+0.014}_{-0.014}$       | $10^9 A_{\text{s}}$                 | $2.094^{+0.067}_{-0.060}$       | $H(2.33)$                   | $235.0^{+5.6}_{-5.4}$        |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.872^{+0.036}_{-0.036}$       | $D_{\text{M}}(2.33)$        | $5790^{+160}_{-160}$         |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                            | $1227^{+27}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                           | $5724^{+73}_{-73}$              | $\sigma_8(0.15)$            | $0.745^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                           | $2535^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                          | $817^{+10}_{-9.6}$              | $\sigma_8(0.38)$            | $0.660^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $D_{2000}$                          | $231.0^{+4.1}_{-3.8}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $n_{\text{s},0.002}$                | $0.965^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | $0.618^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2445^{+0.0053}_{-0.0053}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2458^{+0.0053}_{-0.0053}$    | $\sigma_8(0.61)$            | $0.588^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.58^{+0.11}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.2964^{+0.0085}_{-0.0084}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.86^{+0.39}_{-0.38}$         | $\sigma_8(2.33)$            | $0.3056^{+0.0091}_{-0.0091}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.33}$          | $z_*$                               | $1089.77^{+0.76}_{-0.75}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                               | $145.4^{+3.7}_{-3.7}$           | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.5}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$                       | $1.0413^{+0.0012}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.96^{+0.34}_{-0.34}$         | $\chi_{\text{lensing}}^2$   | $9.22 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.6^{+1.4}_{-1.4}$          | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.9963^{+0.010}_{-0.0098}$     | $r_{\text{drag}}$                   | $148.1^{+3.9}_{-3.8}$           | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.6)$            |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.011}$       | $k_{\text{D}}$                      | $0.1401^{+0.0028}_{-0.0027}$    | $\chi_{\text{CamSpec}}^2$   | $11514.5 (\nu: 16.6)$        |
| $H_0$                                | $67.3^{+2.4}_{-2.5}$            | $100\theta_{\text{D}}$              | $0.16070^{+0.00093}_{-0.00091}$ | $\chi_{6\text{DF}}^2$       | $0.063 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.689^{+0.014}_{-0.014}$       | $z_{\text{eq}}$                     | $3383^{+50}_{-50}$              | $\chi_{\text{MGS}}^2$       | $1.26 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.311^{+0.014}_{-0.014}$       | $k_{\text{eq}}$                     | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$             |
| $\Omega_{\text{m}} h^2$              | $0.1410^{+0.0066}_{-0.0062}$    | $100\theta_{\text{eq}}$             | $0.8167^{+0.0096}_{-0.0093}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^3$              | $0.0949^{+0.0077}_{-0.0073}$    | $100\theta_{\text{s,eq}}$           | $0.4512^{+0.0048}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11944.0 (\nu: 17.4)$        |
| $\sigma_8$                           | $0.806^{+0.020}_{-0.020}$       | $H(0.15)$                           | $72.5^{+2.5}_{-2.5}$            | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$             |
| $S_8$                                | $0.821^{+0.021}_{-0.022}$       | $D_{\text{M}}(0.15)$                | $644^{+24}_{-22}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11957.94; \Delta\bar{\chi}_{\text{eff}}^2 = 0.68; R - 1 = 0.01105$$



### 6.23 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Aver15\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02230^{+0.00035}_{-0.00034}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.448^{+0.013}_{-0.014}$       | $H(0.38)$                   | $82.6^{+2.2}_{-2.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1177^{+0.0056}_{-0.0053}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.38)$      | $1537^{+45}_{-44}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04111^{+0.00083}_{-0.00083}$ | $\sigma_8/h^{0.5}$                    | $0.980^{+0.020}_{-0.020}$       | $H(0.51)$                   | $89.3^{+2.3}_{-2.2}$         |
| $\tau$                                   | $0.055^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $99.7^{+1.6}_{-1.6}$            | $D_{\mathrm{M}}(0.51)$      | $1991^{+57}_{-55}$           |
| $N_{\mathrm{eff}}$                       | $2.97^{+0.33}_{-0.32}$          | $\langle d^2 \rangle^{1/2}$           | $2.427^{+0.047}_{-0.045}$       | $H(0.61)$                   | $94.8^{+2.3}_{-2.3}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.038^{+0.031}_{-0.030}$       | $z_{\mathrm{re}}$                     | $< 8.84$                        | $D_{\mathrm{M}}(0.61)$      | $2317^{+65}_{-64}$           |
| $n_{\mathrm{s}}$                         | $0.965^{+0.013}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.086^{+0.065}_{-0.062}$       | $H(2.33)$                   | $234.7^{+4.9}_{-4.6}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.869^{+0.033}_{-0.033}$       | $D_{\mathrm{M}}(2.33)$      | $5793^{+140}_{-140}$         |
| $A_{100}^{\mathrm{PS}}$                  | $237^{+50}_{-50}$               | $D_{40}$                              | $1225^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.452^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                             | $5720^{+74}_{-74}$              | $\sigma_8(0.15)$            | $0.743^{+0.019}_{-0.018}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+20}_{-30}$               | $D_{810}$                             | $2533^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.471^{+0.012}_{-0.012}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $817^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.658^{+0.017}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.59$                        | $D_{2000}$                            | $230.9^{+3.8}_{-3.7}$           | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.27}_{-0.27}$          | $n_{\mathrm{s},0.002}$                | $0.965^{+0.013}_{-0.013}$       | $\sigma_8(0.51)$            | $0.616^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2443^{+0.0045}_{-0.0044}$    | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2457^{+0.0045}_{-0.0044}$    | $\sigma_8(0.61)$            | $0.586^{+0.015}_{-0.015}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.574^{+0.095}_{-0.092}$       | $f\sigma_8(2.33)$           | $0.2957^{+0.0079}_{-0.0076}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.87^{+0.33}_{-0.32}$         | $\sigma_8(2.33)$            | $0.3049^{+0.0084}_{-0.0081}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $z_*$                                 | $1089.73^{+0.70}_{-0.69}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                 | $145.5^{+3.2}_{-3.2}$           | $f_{2000}^{217}$            | $106.3^{+4.2}_{-4.2}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$                         | $1.0414^{+0.0010}_{-0.0010}$    | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.97^{+0.29}_{-0.30}$         | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.5^{+1.2}_{-1.2}$          | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 0.5)$            |
| $c_{TE}$                                 | $0.9963^{+0.0099}_{-0.0099}$    | $r_{\mathrm{drag}}$                   | $148.2^{+3.3}_{-3.3}$           | $\chi_{\mathrm{CamSpec}}^2$ | $11514.8 (\nu: 16.7)$        |
| $c_{EE}$                                 | $0.991^{+0.010}_{-0.010}$       | $k_{\mathrm{D}}$                      | $0.1400^{+0.0024}_{-0.0023}$    | $\chi_{\mathrm{Aver15}}^2$  | $0.36 (\nu: 0.1)$            |
| $H_0$                                    | $67.3^{+2.1}_{-2.1}$            | $100\theta_{\mathrm{D}}$              | $0.16068^{+0.00081}_{-0.00080}$ | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.690^{+0.013}_{-0.013}$       | $z_{\mathrm{eq}}$                     | $3379^{+50}_{-48}$              | $\chi_{\mathrm{MGS}}^2$     | $1.33 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.013}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01026^{+0.00022}_{-0.00021}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.1)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1406^{+0.0058}_{-0.0055}$    | $100\theta_{\mathrm{eq}}$             | $0.8175^{+0.0092}_{-0.0092}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0947^{+0.0066}_{-0.0062}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4516^{+0.0047}_{-0.0047}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |
| $\sigma_8$                               | $0.804^{+0.020}_{-0.020}$       | $H(0.15)$                             | $72.6^{+2.1}_{-2.1}$            | $\chi_{\mathrm{CMB}}^2$     | $11934.7 (\nu: 16.5)$        |
| $S_8$                                    | $0.817^{+0.024}_{-0.025}$       | $D_{\mathrm{M}}(0.15)$                | $644^{+20}_{-19}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.97; R - 1 = 0.00928$$



## 6.24 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02229^{+0.00035}_{-0.00034}$ | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.601^{+0.015}_{-0.015}$       | $H(0.51)$                   | $89.4^{+2.1}_{-2.1}$         |
| $\Omega_{\text{c}} h^2$              | $0.1181^{+0.0051}_{-0.0050}$    | $\sigma_8/h^{0.5}$                  | $0.980^{+0.019}_{-0.019}$       | $D_{\text{M}}(0.51)$        | $1988^{+54}_{-53}$           |
| $100\theta_{\text{MC}}$              | $1.04106^{+0.00081}_{-0.00078}$ | $r_{\text{drag}} h$                 | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.0^{+2.2}_{-2.1}$         |
| $\tau$                               | $0.055^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$         | $2.427^{+0.047}_{-0.045}$       | $D_{\text{M}}(0.61)$        | $2313^{+61}_{-60}$           |
| $N_{\text{eff}}$                     | $3.00^{+0.31}_{-0.29}$          | $z_{\text{re}}$                     | $< 8.84$                        | $H(2.33)$                   | $235.1^{+4.6}_{-4.4}$        |
| $\ln(10^{10} A_{\text{s}})$          | $3.039^{+0.031}_{-0.030}$       | $10^9 A_{\text{s}}$                 | $2.088^{+0.064}_{-0.061}$       | $D_{\text{M}}(2.33)$        | $5783^{+130}_{-130}$         |
| $n_{\text{s}}$                       | $0.966^{+0.012}_{-0.012}$       | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.871^{+0.032}_{-0.032}$       | $f\sigma_8(0.15)$           | $0.453^{+0.012}_{-0.013}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0049}$    | $D_{40}$                            | $1224^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.744^{+0.018}_{-0.017}$    |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{220}$                           | $5718^{+74}_{-75}$              | $f\sigma_8(0.38)$           | $0.471^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{810}$                           | $2533^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.660^{+0.016}_{-0.015}$    |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{1420}$                          | $816.2^{+9.7}_{-9.6}$           | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{2000}$                          | $230.6^{+3.7}_{-3.5}$           | $\sigma_8(0.51)$            | $0.617^{+0.015}_{-0.015}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $n_{\text{s},0.002}$                | $0.966^{+0.012}_{-0.012}$       | $f\sigma_8(0.61)$           | $0.465^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.27}_{-0.27}$          | $Y_{\text{P}}$                      | $0.2447^{+0.0042}_{-0.0041}$    | $\sigma_8(0.61)$            | $0.587^{+0.015}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2460^{+0.0042}_{-0.0041}$    | $f\sigma_8(2.33)$           | $0.2962^{+0.0075}_{-0.0072}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$            | $2.583^{+0.084}_{-0.084}$       | $\sigma_8(2.33)$            | $0.3054^{+0.0081}_{-0.0077}$ |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$             | $13.85^{+0.30}_{-0.31}$         | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $z_*$                               | $1089.80^{+0.63}_{-0.63}$       | $f_{2000}^{217}$            | $106.5^{+4.2}_{-4.1}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $r_*$                               | $145.2^{+2.9}_{-3.0}$           | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$                       | $1.04128^{+0.00096}_{-0.00094}$ | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.4)$           |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.95^{+0.27}_{-0.28}$         | $\chi_{\text{lowl}}^2$      | $23.01 (\nu: 0.5)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$                   | $1059.6^{+1.2}_{-1.2}$          | $\chi_{\text{CamSpec}}^2$   | $11514.7 (\nu: 16.6)$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$                   | $147.9^{+3.1}_{-3.1}$           | $\chi_{\text{Aver15}}^2$    | $0.36 (\nu: 0.1)$            |
| $c_{TE}$                             | $0.9966^{+0.0098}_{-0.0097}$    | $k_{\text{D}}$                      | $0.1401^{+0.0023}_{-0.0022}$    | $\chi_{\text{Cooke17}}^2$   | $0.35 (\nu: 0.1)$            |
| $c_{EE}$                             | $0.992^{+0.010}_{-0.010}$       | $100\theta_{\text{D}}$              | $0.16076^{+0.00072}_{-0.00072}$ | $\chi_{6\text{DF}}^2$       | $0.054 (\nu: 0.0)$           |
| $H_0$                                | $67.4^{+2.0}_{-2.0}$            | $z_{\text{eq}}$                     | $3378^{+49}_{-48}$              | $\chi_{\text{MGS}}^2$       | $1.34 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                   | $0.690^{+0.013}_{-0.013}$       | $k_{\text{eq}}$                     | $0.01027^{+0.00021}_{-0.00020}$ | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 1.0)$             |
| $\Omega_{\text{m}}$                  | $0.310^{+0.013}_{-0.013}$       | $100\theta_{\text{eq}}$             | $0.8176^{+0.0091}_{-0.0092}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$             |
| $\Omega_{\text{m}} h^2$              | $0.1411^{+0.0054}_{-0.0051}$    | $100\theta_{\text{s,eq}}$           | $0.4517^{+0.0046}_{-0.0047}$    | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.6)$             |
| $\Omega_{\text{m}} h^3$              | $0.0951^{+0.0062}_{-0.0058}$    | $H(0.15)$                           | $72.7^{+2.0}_{-2.0}$            | $\chi_{\text{CMB}}^2$       | $11934.6 (\nu: 16.2)$        |
| $\sigma_8$                           | $0.805^{+0.019}_{-0.018}$       | $D_{\text{M}}(0.15)$                | $643^{+19}_{-18}$               | $\chi_{\text{Abund}}^2$     | $0.71 (\nu: 0.2)$            |
| $S_8$                                | $0.819^{+0.024}_{-0.025}$       | $H(0.38)$                           | $82.7^{+2.1}_{-2.0}$            |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.448^{+0.013}_{-0.014}$       | $D_{\text{M}}(0.38)$                | $1534^{+43}_{-42}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11949.15; R - 1 = 0.01020$$



## 6.25 base\_nnu\_CamSpecHM\_TTTEE\_lowl\_lowE\_Riess18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022599 | $0.02261^{+0.00037}_{-0.00036}$ | $S_8$                       | 0.8140   | $0.815^{+0.031}_{-0.030}$       | $H(0.15)$                   | 75.40    | $75.5^{+2.4}_{-2.4}$         |
| $\Omega_c h^2$                       | 0.1230   | $0.1231^{+0.0061}_{-0.0061}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4459   | $0.446^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | 618.8    | $619^{+21}_{-20}$            |
| $100\theta_{MC}$                     | 1.04053  | $1.04053^{+0.00083}_{-0.00080}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6040   | $0.604^{+0.018}_{-0.018}$       | $H(0.38)$                   | 85.47    | $85.5^{+2.4}_{-2.4}$         |
| $\tau$                               | 0.0553   | $0.056^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | 0.9767   | $0.977^{+0.023}_{-0.023}$       | $D_M(0.38)$                 | 1479.3   | $1479^{+48}_{-45}$           |
| $N_{\text{eff}}$                     | 3.374    | $3.38^{+0.35}_{-0.36}$          | $r_{\text{drag}} h$         | 101.37   | $101.4^{+2.2}_{-2.1}$           | $H(0.51)$                   | 92.18    | $92.2^{+2.4}_{-2.5}$         |
| $\ln(10^{10} A_s)$                   | 3.0526   | $3.053^{+0.036}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | 2.399    | $2.399^{+0.054}_{-0.055}$       | $D_M(0.51)$                 | 1919     | $1918^{+60}_{-57}$           |
| $n_s$                                | 0.9799   | $0.980^{+0.013}_{-0.014}$       | $z_{\text{re}}$             | 7.82     | $7.8^{+1.6}_{-1.7}$             | $H(0.61)$                   | 97.81    | $97.9^{+2.5}_{-2.5}$         |
| $y_{\text{cal}}$                     | 1.00057  | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_s$                  | 2.117    | $2.119^{+0.077}_{-0.074}$       | $D_M(0.61)$                 | 2234     | $2233^{+68}_{-65}$           |
| $A_{100}^{\text{PS}}$                | 246.6    | $247^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8953   | $1.896^{+0.033}_{-0.034}$       | $H(2.33)$                   | 239.8    | $239.9^{+5.1}_{-5.2}$        |
| $A_{143}^{\text{PS}}$                | 40.2     | $43^{+20}_{-20}$                | $D_{40}$                    | 1207.3   | $1207^{+28}_{-26}$              | $D_M(2.33)$                 | 5624     | $5621^{+140}_{-140}$         |
| $A_{217}^{\text{PS}}$                | 98.5     | $101^{+30}_{-30}$               | $D_{220}$                   | 5726     | $5726^{+79}_{-76}$              | $f\sigma_8(0.15)$           | 0.4516   | $0.452^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | 45.2     | $42^{+10}_{-10}$                | $D_{810}$                   | 2538.5   | $2539^{+28}_{-27}$              | $\sigma_8(0.15)$            | 0.7575   | $0.758^{+0.020}_{-0.020}$    |
| $A_{143}^{\text{tSZ}}$               | 4.90     | $< 7.37$                        | $D_{1420}$                  | 814.4    | $815^{+10}_{-9.9}$              | $f\sigma_8(0.38)$           | 0.4734   | $0.474^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.548    | $0.65^{+0.25}_{-0.24}$          | $D_{2000}$                  | 228.62   | $228.7^{+3.9}_{-3.9}$           | $\sigma_8(0.38)$            | 0.6731   | $0.674^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.72     | —                               | $n_{s,0.002}$               | 0.9799   | $0.980^{+0.013}_{-0.014}$       | $f\sigma_8(0.51)$           | 0.4737   | $0.474^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.00     | —                               | $Y_P$                       | 0.24977  | $0.2499^{+0.0045}_{-0.0047}$    | $\sigma_8(0.51)$            | 0.6306   | $0.631^{+0.017}_{-0.017}$    |
| $A^{\text{kSZ}}$                     | 3.0      | —                               | $Y_P^{\text{BBN}}$          | 0.25111  | $0.2512^{+0.0045}_{-0.0048}$    | $f\sigma_8(0.61)$           | 0.4699   | $0.470^{+0.013}_{-0.013}$    |
| $A_{100}^{\text{dust}}$              | 1.017    | $1.02^{+0.38}_{-0.39}$          | $10^5 D/H$                  | 2.656    | $2.66^{+0.10}_{-0.10}$          | $\sigma_8(0.61)$            | 0.6004   | $0.601^{+0.016}_{-0.017}$    |
| $A_{143}^{\text{dust}}$              | 0.980    | $0.98^{+0.34}_{-0.34}$          | Age/Gyr                     | 13.468   | $13.46^{+0.34}_{-0.32}$         | $f\sigma_8(2.33)$           | 0.3033   | $0.3036^{+0.0085}_{-0.0086}$ |
| $A_{217}^{\text{dust}}$              | 0.960    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1090.20  | $1090.22^{+0.76}_{-0.77}$       | $\sigma_8(2.33)$            | 0.3134   | $0.3137^{+0.0091}_{-0.0093}$ |
| $A_{143 \times 217}^{\text{dust}}$   | 1.004    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 141.92   | $141.9^{+3.3}_{-3.1}$           | $f_{2000}^{143}$            | 32.3     | $32^{+6}_{-6}$               |
| $c_{100}$                            | 0.99752  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04050  | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{217}$            | 108.57   | $108.4^{+4.2}_{-4.2}$        |
| $c_{217}$                            | 1.00146  | $1.0013^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.639   | $13.63^{+0.31}_{-0.29}$         | $f_{2000}^{143 \times 217}$ | 33.94    | $34^{+5}_{-5}$               |
| $c_{TE}$                             | 0.9988   | $0.9990^{+0.0098}_{-0.0098}$    | $z_{\text{drag}}$           | 1060.92  | $1061.0^{+1.3}_{-1.3}$          | $\chi_{\text{small}}^2$     | 396.09   | $397.2 (\nu: 1.7)$           |
| $c_{EE}$                             | 0.9965   | $0.997^{+0.011}_{-0.011}$       | $r_{\text{drag}}$           | 144.47   | $144.4^{+3.5}_{-3.2}$           | $\chi_{\text{lowl}}^2$      | 21.47    | $21.54 (\nu: 0.3)$           |
| $H_0$                                | 70.17    | $70.2^{+2.4}_{-2.4}$            | $k_D$                       | 0.14261  | $0.1427^{+0.0024}_{-0.0025}$    | $\chi_{\text{CamSpec}}^2$   | 11505.1  | $11520.7 (\nu: 21.9)$        |
| $\Omega_\Lambda$                     | 0.7030   | $0.703^{+0.016}_{-0.016}$       | $100\theta_D$               | 0.16152  | $0.16153^{+0.00084}_{-0.00087}$ | $\chi_{\text{H073p45}}^2$   | 3.9      | $4.3 (\nu: 4.5)$             |
| $\Omega_m$                           | 0.2970   | $0.297^{+0.016}_{-0.016}$       | $z_{\text{eq}}$             | 3332     | $3332^{+62}_{-61}$              | $\chi_{\text{prior}}^2$     | 2.4      | $7.9 (\nu: 6.2)$             |
| $\Omega_m h^2$                       | 0.1462   | $0.1464^{+0.0062}_{-0.0062}$    | $k_{\text{eq}}$             | 0.010391 | $0.01040^{+0.00025}_{-0.00024}$ | $\chi_{\text{CMB}}^2$       | 11922.6  | $11939.4 (\nu: 20.9)$        |
| $\Omega_m h^3$                       | 0.1026   | $0.1028^{+0.0072}_{-0.0071}$    | $100\theta_{\text{eq}}$     | 0.8266   | $0.827^{+0.012}_{-0.012}$       |                             |          |                              |
| $\sigma_8$                           | 0.8182   | $0.819^{+0.022}_{-0.022}$       | $100\theta_{s,\text{eq}}$   | 0.4562   | $0.4562^{+0.0061}_{-0.0061}$    |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11928.99$ ;  $\bar{\chi}_{\text{eff}}^2 = 11951.65$ ;  $\Delta\chi_{\text{eff}}^2 = -2.61$ ;  $R - 1 = 0.01475$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.09 commander\_dx12\_v3.2\_29: 21.47 CamSpec like\_10.7HM\_1400\_unified: 11505.09 Hubble - H073p45: 3.91



## 6.26 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02256^{+0.00033}_{-0.00032}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.015}_{-0.014}$       | $H(0.38)$                   | $85.2^{+2.2}_{-2.2}$         |
| $\Omega_{\text{c}} h^2$              | $0.1232^{+0.0062}_{-0.0062}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.606^{+0.017}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1485^{+43}_{-40}$           |
| $100\theta_{\text{MC}}$              | $1.04052^{+0.00086}_{-0.00079}$ | $\sigma_8/h^{0.5}$                  | $0.980^{+0.021}_{-0.021}$       | $H(0.51)$                   | $91.9^{+2.3}_{-2.3}$         |
| $\tau$                               | $0.055^{+0.016}_{-0.015}$       | $r_{\text{drag}} h$                 | $101.0^{+1.6}_{-1.6}$           | $D_{\text{M}}(0.51)$        | $1926^{+54}_{-51}$           |
| $N_{\text{eff}}$                     | $3.35^{+0.35}_{-0.35}$          | $\langle d^2 \rangle^{1/2}$         | $2.407^{+0.048}_{-0.047}$       | $H(0.61)$                   | $97.6^{+2.3}_{-2.4}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.052^{+0.035}_{-0.035}$       | $z_{\text{re}}$                     | $7.8^{+1.5}_{-1.6}$             | $D_{\text{M}}(0.61)$        | $2243^{+62}_{-58}$           |
| $n_{\text{s}}$                       | $0.978^{+0.012}_{-0.012}$       | $10^9 A_{\text{s}}$                 | $2.116^{+0.076}_{-0.073}$       | $H(2.33)$                   | $239.8^{+5.2}_{-5.3}$        |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0048}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.896^{+0.033}_{-0.035}$       | $D_{\text{M}}(2.33)$        | $5635^{+140}_{-130}$         |
| $A_{100}^{\text{PS}}$                | $246^{+50}_{-50}$               | $D_{40}$                            | $1210^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{220}$                           | $5723^{+80}_{-77}$              | $\sigma_8(0.15)$            | $0.758^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                           | $2539^{+28}_{-26}$              | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $42^{+20}_{-10}$                | $D_{1420}$                          | $814^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | $0.673^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $D_{2000}$                          | $228.7^{+4.0}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.475^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $n_{\text{s},0.002}$                | $0.978^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$            | $0.630^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2495^{+0.0045}_{-0.0047}$    | $f\sigma_8(0.61)$           | $0.471^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2508^{+0.0045}_{-0.0047}$    | $\sigma_8(0.61)$            | $0.600^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.66^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.3030^{+0.0083}_{-0.0084}$ |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.49^{+0.33}_{-0.31}$         | $\sigma_8(2.33)$            | $0.3129^{+0.0088}_{-0.0089}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                               | $1090.25^{+0.75}_{-0.77}$       | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                               | $142.0^{+3.4}_{-3.2}$           | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                       | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.65^{+0.31}_{-0.29}$         | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1060.8^{+1.2}_{-1.2}$          | $\chi_{\text{lowl}}^2$      | $21.73 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9987^{+0.0095}_{-0.0098}$    | $r_{\text{drag}}$                   | $144.6^{+3.5}_{-3.3}$           | $\chi_{\text{CamSpec}}^2$   | $11519.5 (\nu: 20.0)$        |
| $c_{EE}$                             | $0.996^{+0.011}_{-0.010}$       | $k_{\text{D}}$                      | $0.1426^{+0.0025}_{-0.0025}$    | $\chi_{\text{H073p45}}^2$   | $5.2 (\nu: 4.1)$             |
| $H_0$                                | $69.8^{+2.1}_{-2.1}$            | $100\theta_{\text{D}}$              | $0.16148^{+0.00085}_{-0.00086}$ | $\chi_{6\text{DF}}^2$       | $0.036 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.700^{+0.012}_{-0.012}$       | $z_{\text{eq}}$                     | $3344^{+46}_{-46}$              | $\chi_{\text{MGS}}^2$       | $2.04 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.300^{+0.012}_{-0.012}$       | $k_{\text{eq}}$                     | $0.01042^{+0.00024}_{-0.00024}$ | $\chi_{\text{DR12BAO}}^2$   | $3.84 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1464^{+0.0063}_{-0.0063}$    | $100\theta_{\text{eq}}$             | $0.8243^{+0.0090}_{-0.0088}$    | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\Omega_{\text{m}} h^3$              | $0.1022^{+0.0071}_{-0.0070}$    | $100\theta_{\text{s,eq}}$           | $0.4550^{+0.0046}_{-0.0045}$    | $\chi_{\text{BAO}}^2$       | $5.92 (\nu: 0.4)$            |
| $\sigma_8$                           | $0.819^{+0.022}_{-0.022}$       | $H(0.15)$                           | $75.1^{+2.1}_{-2.1}$            | $\chi_{\text{CMB}}^2$       | $11938.4 (\nu: 19.5)$        |
| $S_8$                                | $0.819^{+0.027}_{-0.026}$       | $D_{\text{M}}(0.15)$                | $622^{+19}_{-18}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11957.32; R - 1 = 0.01940$$



## 6.27 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_Pantheon18

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02256^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | $85.2^{+2.2}_{-2.2}$         |
| $\Omega_{\text{c}} h^2$              | $0.1232^{+0.0062}_{-0.0062}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.606^{+0.017}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1485^{+42}_{-40}$           |
| $100\theta_{\text{MC}}$              | $1.04052^{+0.00086}_{-0.00079}$ | $\sigma_8/h^{0.5}$                  | $0.980^{+0.021}_{-0.021}$       | $H(0.51)$                   | $92.0^{+2.2}_{-2.3}$         |
| $\tau$                               | $0.055^{+0.016}_{-0.015}$       | $r_{\text{drag}} h$                 | $101.0^{+1.5}_{-1.5}$           | $D_{\text{M}}(0.51)$        | $1926^{+53}_{-50}$           |
| $N_{\text{eff}}$                     | $3.36^{+0.35}_{-0.35}$          | $\langle d^2 \rangle^{1/2}$         | $2.406^{+0.047}_{-0.047}$       | $H(0.61)$                   | $97.6^{+2.3}_{-2.4}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.052^{+0.035}_{-0.035}$       | $z_{\text{re}}$                     | $7.8^{+1.5}_{-1.6}$             | $D_{\text{M}}(0.61)$        | $2242^{+61}_{-58}$           |
| $n_{\text{s}}$                       | $0.979^{+0.012}_{-0.012}$       | $10^9 A_{\text{s}}$                 | $2.116^{+0.075}_{-0.073}$       | $H(2.33)$                   | $239.8^{+5.2}_{-5.3}$        |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0048}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.896^{+0.033}_{-0.035}$       | $D_{\text{M}}(2.33)$        | $5635^{+140}_{-130}$         |
| $A_{100}^{\text{PS}}$                | $246^{+50}_{-50}$               | $D_{40}$                            | $1210^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{220}$                           | $5723^{+80}_{-77}$              | $\sigma_8(0.15)$            | $0.758^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                           | $2539^{+28}_{-26}$              | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $42^{+20}_{-10}$                | $D_{1420}$                          | $814^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | $0.673^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $D_{2000}$                          | $228.7^{+4.0}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.475^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $n_{\text{s},0.002}$                | $0.979^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$            | $0.630^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2495^{+0.0045}_{-0.0047}$    | $f\sigma_8(0.61)$           | $0.471^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2508^{+0.0045}_{-0.0047}$    | $\sigma_8(0.61)$            | $0.600^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.66^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.3030^{+0.0083}_{-0.0084}$ |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.49^{+0.33}_{-0.31}$         | $\sigma_8(2.33)$            | $0.3129^{+0.0088}_{-0.0089}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                               | $1090.25^{+0.75}_{-0.77}$       | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                               | $142.0^{+3.4}_{-3.2}$           | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                       | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.65^{+0.31}_{-0.29}$         | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1060.8^{+1.2}_{-1.2}$          | $\chi_{\text{lowl}}^2$      | $21.73 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9987^{+0.0095}_{-0.0098}$    | $r_{\text{drag}}$                   | $144.6^{+3.5}_{-3.3}$           | $\chi_{\text{CamSpec}}^2$   | $11519.6 (\nu: 19.9)$        |
| $c_{EE}$                             | $0.996^{+0.011}_{-0.011}$       | $k_{\text{D}}$                      | $0.1426^{+0.0025}_{-0.0025}$    | $\chi_{\text{H073p45}}^2$   | $5.1 (\nu: 4.0)$             |
| $H_0$                                | $69.8^{+2.0}_{-2.1}$            | $100\theta_{\text{D}}$              | $0.16149^{+0.00085}_{-0.00086}$ | $\chi_{\text{JLA}}^2$       | $1034.81 (\nu: 0.0)$         |
| $\Omega_{\Lambda}$                   | $0.700^{+0.012}_{-0.012}$       | $z_{\text{eq}}$                     | $3344^{+45}_{-45}$              | $\chi_{6\text{DF}}^2$       | $0.035 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.300^{+0.012}_{-0.012}$       | $k_{\text{eq}}$                     | $0.01041^{+0.00024}_{-0.00024}$ | $\chi_{\text{MGS}}^2$       | $2.05 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^2$              | $0.1464^{+0.0063}_{-0.0063}$    | $100\theta_{\text{eq}}$             | $0.8243^{+0.0087}_{-0.0086}$    | $\chi_{\text{DR12BAO}}^2$   | $3.81 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^3$              | $0.1023^{+0.0070}_{-0.0070}$    | $100\theta_{\text{s,eq}}$           | $0.4550^{+0.0044}_{-0.0044}$    | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.819^{+0.022}_{-0.022}$       | $H(0.15)$                           | $75.1^{+2.1}_{-2.1}$            | $\chi_{\text{BAO}}^2$       | $5.90 (\nu: 0.3)$            |
| $S_8$                                | $0.819^{+0.026}_{-0.026}$       | $D_{\text{M}}(0.15)$                | $622^{+18}_{-17}$               | $\chi_{\text{CMB}}^2$       | $11938.4 (\nu: 19.4)$        |

$$\bar{\chi}_{\text{eff}}^2 = 12992.06; R - 1 = 0.01918$$



## 6.28 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02259^{+0.00037}_{-0.00035}$ | $S_8$                               | $0.820^{+0.025}_{-0.024}$       | $H(0.15)$                   | $75.2^{+2.4}_{-2.4}$         |
| $\Omega_{\text{c}} h^2$              | $0.1231^{+0.0059}_{-0.0058}$    | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.013}_{-0.013}$       | $D_{\text{M}}(0.15)$        | $621^{+21}_{-20}$            |
| $100\theta_{\text{MC}}$              | $1.04053^{+0.00083}_{-0.00078}$ | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.607^{+0.014}_{-0.014}$       | $H(0.38)$                   | $85.3^{+2.4}_{-2.4}$         |
| $\tau$                               | $0.058^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$                  | $0.982^{+0.018}_{-0.018}$       | $D_{\text{M}}(0.38)$        | $1483^{+48}_{-45}$           |
| $N_{\text{eff}}$                     | $3.36^{+0.35}_{-0.36}$          | $r_{\text{drag}} h$                 | $101.1^{+2.0}_{-2.0}$           | $H(0.51)$                   | $92.0^{+2.4}_{-2.4}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.058^{+0.033}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$         | $2.411^{+0.043}_{-0.043}$       | $D_{\text{M}}(0.51)$        | $1923^{+60}_{-57}$           |
| $n_{\text{s}}$                       | $0.979^{+0.013}_{-0.014}$       | $z_{\text{re}}$                     | $8.0^{+1.5}_{-1.5}$             | $H(0.61)$                   | $97.7^{+2.5}_{-2.5}$         |
| $y_{\text{cal}}$                     | $1.0008^{+0.0051}_{-0.0049}$    | $10^9 A_{\text{s}}$                 | $2.129^{+0.071}_{-0.066}$       | $D_{\text{M}}(0.61)$        | $2240^{+68}_{-65}$           |
| $A_{100}^{\text{PS}}$                | $247^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.897^{+0.031}_{-0.032}$       | $H(2.33)$                   | $239.8^{+5.0}_{-5.0}$        |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{40}$                            | $1211^{+27}_{-25}$              | $D_{\text{M}}(2.33)$        | $5631^{+140}_{-140}$         |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{220}$                           | $5731^{+80}_{-76}$              | $f\sigma_8(0.15)$           | $0.455^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+20}_{-10}$                | $D_{810}$                           | $2541^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.760^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $D_{1420}$                          | $815^{+10}_{-9.6}$              | $f\sigma_8(0.38)$           | $0.476^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $D_{2000}$                          | $228.9^{+4.0}_{-3.9}$           | $\sigma_8(0.38)$            | $0.675^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$                | $0.979^{+0.013}_{-0.014}$       | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                      | $0.2496^{+0.0045}_{-0.0047}$    | $\sigma_8(0.51)$            | $0.632^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2509^{+0.0045}_{-0.0047}$    | $f\sigma_8(0.61)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D/H}$                   | $2.653^{+0.099}_{-0.10}$        | $\sigma_8(0.61)$            | $0.602^{+0.015}_{-0.016}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $\text{Age/Gyr}$                    | $13.48^{+0.34}_{-0.32}$         | $f\sigma_8(2.33)$           | $0.3040^{+0.0081}_{-0.0081}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $z_*$                               | $1090.22^{+0.73}_{-0.74}$       | $\sigma_8(2.33)$            | $0.3140^{+0.0088}_{-0.0088}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.32}$          | $r_*$                               | $142.0^{+3.2}_{-3.1}$           | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                       | $1.0405^{+0.0010}_{-0.00095}$   | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.3}$        |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.64^{+0.30}_{-0.29}$         | $f_{2000}^{143 \times 217}$ | $34^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9986^{+0.0095}_{-0.0098}$    | $z_{\text{drag}}$                   | $1060.9^{+1.2}_{-1.3}$          | $\chi_{\text{lensing}}^2$   | $9.92 (\nu: 0.5)$            |
| $c_{EE}$                             | $0.996^{+0.010}_{-0.011}$       | $r_{\text{drag}}$                   | $144.5^{+3.3}_{-3.2}$           | $\chi_{\text{simall}}^2$    | $397.5 (\nu: 2.3)$           |
| $H_0$                                | $70.0^{+2.4}_{-2.4}$            | $k_{\text{D}}$                      | $0.1426^{+0.0024}_{-0.0024}$    | $\chi_{\text{lowl}}^2$      | $21.79 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                   | $0.701^{+0.015}_{-0.016}$       | $100\theta_{\text{D}}$              | $0.16148^{+0.00084}_{-0.00086}$ | $\chi_{\text{CamSpec}}^2$   | $11519.4 (\nu: 20.4)$        |
| $\Omega_{\text{m}}$                  | $0.299^{+0.016}_{-0.015}$       | $z_{\text{eq}}$                     | $3341^{+58}_{-57}$              | $\chi_{\text{H073p45}}^2$   | $5.0 (\nu: 5.0)$             |
| $\Omega_{\text{m}} h^2$              | $0.1463^{+0.0060}_{-0.0060}$    | $k_{\text{eq}}$                     | $0.01041^{+0.00023}_{-0.00022}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.3)$             |
| $\Omega_{\text{m}} h^3$              | $0.1024^{+0.0071}_{-0.0070}$    | $100\theta_{\text{eq}}$             | $0.825^{+0.011}_{-0.011}$       | $\chi_{\text{CMB}}^2$       | $11948.6 (\nu: 21.5)$        |
| $\sigma_8$                           | $0.821^{+0.019}_{-0.019}$       | $100\theta_{\text{s,eq}}$           | $0.4553^{+0.0057}_{-0.0056}$    |                             |                              |

$\bar{\chi}_{\text{eff}}^2 = 11961.40$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -2.22$ ;  $R - 1 = 0.02109$



## 6.29 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02255^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.012}_{-0.012}$       | $H(0.38)$                   | $85.1^{+2.1}_{-2.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1230^{+0.0059}_{-0.0058}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$      | $1488^{+42}_{-40}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04053^{+0.00085}_{-0.00078}$ | $\sigma_8/h^{0.5}$                    | $0.983^{+0.017}_{-0.017}$       | $H(0.51)$                   | $91.8^{+2.2}_{-2.3}$         |
| $\tau$                                   | $0.057^{+0.015}_{-0.014}$       | $r_{\mathrm{drag}} h$                 | $100.8^{+1.5}_{-1.5}$           | $D_{\mathrm{M}}(0.51)$      | $1929^{+54}_{-51}$           |
| $N_{\mathrm{eff}}$                       | $3.34^{+0.34}_{-0.34}$          | $\langle d^2 \rangle^{1/2}$           | $2.415^{+0.039}_{-0.040}$       | $H(0.61)$                   | $97.5^{+2.3}_{-2.3}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.056^{+0.031}_{-0.031}$       | $z_{\mathrm{re}}$                     | $8.0^{+1.4}_{-1.4}$             | $D_{\mathrm{M}}(0.61)$      | $2246^{+61}_{-58}$           |
| $n_{\mathrm{s}}$                         | $0.978^{+0.012}_{-0.012}$       | $10^9 A_{\mathrm{s}}$                 | $2.125^{+0.066}_{-0.064}$       | $H(2.33)$                   | $239.7^{+4.9}_{-5.0}$        |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0051}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.897^{+0.031}_{-0.032}$       | $D_{\mathrm{M}}(2.33)$      | $5642^{+130}_{-130}$         |
| $A_{100}^{\mathrm{PS}}$                  | $246^{+50}_{-50}$               | $D_{40}$                              | $1213^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                  | $43^{+20}_{-20}$                | $D_{220}$                             | $5729^{+80}_{-76}$              | $\sigma_8(0.15)$            | $0.759^{+0.018}_{-0.018}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{810}$                             | $2540^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.476^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{1420}$                            | $815^{+10}_{-9.6}$              | $\sigma_8(0.38)$            | $0.674^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.36$                        | $D_{2000}$                            | $229.0^{+4.0}_{-3.9}$           | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.24}_{-0.24}$          | $n_{\mathrm{s},0.002}$                | $0.978^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$            | $0.631^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2493^{+0.0043}_{-0.0046}$    | $f\sigma_8(0.61)$           | $0.472^{+0.011}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2506^{+0.0043}_{-0.0046}$    | $\sigma_8(0.61)$            | $0.601^{+0.015}_{-0.015}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.652^{+0.099}_{-0.10}$        | $f\sigma_8(2.33)$           | $0.3034^{+0.0076}_{-0.0077}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.51^{+0.32}_{-0.31}$         | $\sigma_8(2.33)$            | $0.3133^{+0.0081}_{-0.0082}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.23^{+0.73}_{-0.75}$       | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $r_*$                                 | $142.1^{+3.2}_{-3.0}$           | $f_{2000}^{217}$            | $108.2^{+4.2}_{-4.4}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.66^{+0.30}_{-0.28}$         | $\chi_{\mathrm{lensing}}^2$ | $9.80 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0013^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1060.8^{+1.2}_{-1.2}$          | $\chi_{\mathrm{simall}}^2$  | $397.3 (\nu: 1.8)$           |
| $c_{TE}$                                 | $0.9985^{+0.0095}_{-0.0098}$    | $r_{\mathrm{drag}}$                   | $144.7^{+3.3}_{-3.2}$           | $\chi_{\mathrm{lowl}}^2$    | $21.90 (\nu: 0.3)$           |
| $c_{EE}$                                 | $0.996^{+0.011}_{-0.011}$       | $k_{\mathrm{D}}$                      | $0.1425^{+0.0024}_{-0.0024}$    | $\chi_{\mathrm{CamSpec}}^2$ | $11518.7 (\nu: 19.3)$        |
| $H_0$                                    | $69.7^{+2.1}_{-2.1}$            | $100\theta_{\mathrm{D}}$              | $0.16144^{+0.00082}_{-0.00085}$ | $\chi_{\mathrm{H073p45}}^2$ | $5.5 (\nu: 4.3)$             |
| $\Omega_{\Lambda}$                       | $0.699^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3348^{+45}_{-44}$              | $\chi_{6\mathrm{DF}}^2$     | $0.030 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.301^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01042^{+0.00022}_{-0.00022}$ | $\chi_{\mathrm{MGS}}^2$     | $1.96 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1462^{+0.0059}_{-0.0060}$    | $100\theta_{\mathrm{eq}}$             | $0.8235^{+0.0085}_{-0.0084}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $3.81 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.1019^{+0.0069}_{-0.0067}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4546^{+0.0044}_{-0.0043}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.1)$             |
| $\sigma_8$                               | $0.820^{+0.019}_{-0.019}$       | $H(0.15)$                             | $75.0^{+2.1}_{-2.1}$            | $\chi_{\mathrm{CMB}}^2$     | $11947.7 (\nu: 19.8)$        |
| $S_8$                                    | $0.822^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$                | $623^{+18}_{-18}$               | $\chi_{\mathrm{BAO}}^2$     | $5.80 (\nu: 0.3)$            |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11966.84; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -1.97; R - 1 = 0.02276$$



### 6.30 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_lensing\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022562 | $0.02256^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6075   | $0.608^{+0.014}_{-0.014}$       | $H(0.51)$                   | 91.85    | $91.8^{+2.2}_{-2.2}$         |
| $\Omega_c h^2$              | 0.1232   | $0.1231^{+0.0058}_{-0.0058}$    | $\sigma_8/h^{0.5}$          | 0.9821   | $0.983^{+0.017}_{-0.017}$       | $D_M(0.51)$                 | 1928     | $1929^{+52}_{-50}$           |
| $100\theta_{MC}$            | 1.04053  | $1.04053^{+0.00085}_{-0.00078}$ | $r_{drag}h$                 | 100.81   | $100.8^{+1.5}_{-1.5}$           | $H(0.61)$                   | 97.50    | $97.5^{+2.3}_{-2.3}$         |
| $\tau$                      | 0.0560   | $0.057^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | 2.4134   | $2.415^{+0.038}_{-0.040}$       | $D_M(0.61)$                 | 2245     | $2246^{+60}_{-57}$           |
| $N_{eff}$                   | 3.343    | $3.34^{+0.33}_{-0.34}$          | $z_{re}$                    | 7.90     | $8.0^{+1.4}_{-1.4}$             | $H(2.33)$                   | 239.78   | $239.7^{+4.9}_{-5.0}$        |
| $\ln(10^{10} A_s)$          | 3.0548   | $3.056^{+0.031}_{-0.030}$       | $10^9 A_s$                  | 2.122    | $2.125^{+0.066}_{-0.064}$       | $D_M(2.33)$                 | 5639     | $5641^{+130}_{-130}$         |
| $n_s$                       | 0.9775   | $0.978^{+0.011}_{-0.012}$       | $10^9 A_s e^{-2\tau}$       | 1.8967   | $1.897^{+0.031}_{-0.032}$       | $f\sigma_8(0.15)$           | 0.4555   | $0.455^{+0.012}_{-0.011}$    |
| $y_{cal}$                   | 1.00059  | $1.0007^{+0.0051}_{-0.0049}$    | $D_{40}$                    | 1212.5   | $1213^{+26}_{-24}$              | $\sigma_8(0.15)$            | 0.7587   | $0.759^{+0.018}_{-0.018}$    |
| $A_{100}^{PS}$              | 245.5    | $246^{+50}_{-50}$               | $D_{220}$                   | 5727     | $5729^{+81}_{-76}$              | $f\sigma_8(0.38)$           | 0.4763   | $0.476^{+0.011}_{-0.011}$    |
| $A_{143}^{PS}$              | 40.5     | $43^{+20}_{-20}$                | $D_{810}$                   | 2539.4   | $2540^{+27}_{-26}$              | $\sigma_8(0.38)$            | 0.6737   | $0.674^{+0.016}_{-0.016}$    |
| $A_{217}^{PS}$              | 99.2     | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.6    | $815^{+10}_{-9.6}$              | $f\sigma_8(0.51)$           | 0.4762   | $0.476^{+0.011}_{-0.011}$    |
| $A_{217}^{CIB}$             | 45.0     | $41^{+20}_{-10}$                | $D_{2000}$                  | 228.83   | $229.0^{+4.0}_{-3.9}$           | $\sigma_8(0.51)$            | 0.6309   | $0.631^{+0.015}_{-0.015}$    |
| $A_{143}^{tSZ}$             | 5.07     | $< 7.36$                        | $n_{s,0.002}$               | 0.9775   | $0.978^{+0.011}_{-0.012}$       | $f\sigma_8(0.61)$           | 0.4720   | $0.472^{+0.010}_{-0.011}$    |
| $r_{143 \times 217}^{PS}$   | 0.557    | $0.65^{+0.24}_{-0.24}$          | $Y_P$                       | 0.24936  | $0.2493^{+0.0043}_{-0.0045}$    | $\sigma_8(0.61)$            | 0.6007   | $0.601^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{CIB}$  | 0.73     | —                               | $Y_P^{BBN}$                 | 0.25070  | $0.2506^{+0.0043}_{-0.0045}$    | $f\sigma_8(2.33)$           | 0.3032   | $0.3034^{+0.0075}_{-0.0076}$ |
| $\xi^{tSZ \times CIB}$      | 0.02     | —                               | $10^5 D/H$                  | 2.652    | $2.652^{+0.099}_{-0.10}$        | $\sigma_8(2.33)$            | 0.3131   | $0.3133^{+0.0080}_{-0.0082}$ |
| $A^{kSZ}$                   | 2.7      | —                               | Age/Gyr                     | 13.503   | $13.51^{+0.32}_{-0.30}$         | $f_{2000}^{143}$            | 32.1     | $32^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.018    | $1.01^{+0.39}_{-0.39}$          | $z_*$                       | 1090.24  | $1090.23^{+0.73}_{-0.75}$       | $f_{2000}^{217}$            | 108.40   | $108.2^{+4.2}_{-4.4}$        |
| $A_{143}^{dust}$            | 0.976    | $0.96^{+0.34}_{-0.34}$          | $r_*$                       | 142.04   | $142.1^{+3.2}_{-3.0}$           | $f_{2000}^{143 \times 217}$ | 33.80    | $34^{+5}_{-4}$               |
| $A_{217}^{dust}$            | 0.965    | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | 1.04052  | $1.0405^{+0.0010}_{-0.00095}$   | $\chi_{lensing}^2$          | 9.46     | $9.80 (\nu: 0.3)$            |
| $A_{143 \times 217}^{dust}$ | 1.004    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.651   | $13.66^{+0.30}_{-0.28}$         | $\chi_{small}^2$            | 396.28   | $397.3 (\nu: 1.9)$           |
| $c_{100}$                   | 0.99758  | $0.9976^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1060.85  | $1060.8^{+1.2}_{-1.2}$          | $\chi_{lowl}^2$             | 21.82    | $21.89 (\nu: 0.3)$           |
| $c_{217}$                   | 1.00150  | $1.0013^{+0.0031}_{-0.0030}$    | $r_{drag}$                  | 144.61   | $144.7^{+3.3}_{-3.1}$           | $\chi_{CamSpec}^2$          | 11503.8  | $11518.7 (\nu: 19.3)$        |
| $c_{TE}$                    | 0.9983   | $0.9985^{+0.0095}_{-0.0098}$    | $k_D$                       | 0.14254  | $0.1425^{+0.0024}_{-0.0024}$    | $\chi_{H073p45}^2$          | 5.1      | $5.5 (\nu: 4.1)$             |
| $c_{EE}$                    | 0.9957   | $0.996^{+0.011}_{-0.010}$       | $100\theta_D$               | 0.16145  | $0.16144^{+0.00082}_{-0.00085}$ | $\chi_{JLA}^2$              | 1034.745 | $1034.81 (\nu: 0.0)$         |
| $H_0$                       | 69.71    | $69.7^{+2.0}_{-2.0}$            | $z_{eq}$                    | 3349.1   | $3348^{+43}_{-43}$              | $\chi_{6DF}^2$              | 0.004    | $0.029 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | 0.6988   | $0.699^{+0.011}_{-0.011}$       | $k_{eq}$                    | 0.010423 | $0.01042^{+0.00022}_{-0.00022}$ | $\chi_{MGS}^2$              | 1.89     | $1.97 (\nu: 0.1)$            |
| $\Omega_m$                  | 0.3012   | $0.301^{+0.011}_{-0.011}$       | $100\theta_{eq}$            | 0.8234   | $0.8237^{+0.0083}_{-0.0082}$    | $\chi_{DR12BAO}^2$          | 3.43     | $3.79 (\nu: 0.1)$            |
| $\Omega_m h^2$              | 0.1464   | $0.1463^{+0.0059}_{-0.0060}$    | $100\theta_{s,eq}$          | 0.45449  | $0.4546^{+0.0042}_{-0.0042}$    | $\chi_{prior}^2$            | 2.4      | $7.8 (\nu: 6.1)$             |
| $\Omega_m h^3$              | 0.1020   | $0.1020^{+0.0069}_{-0.0067}$    | $H(0.15)$                   | 74.98    | $75.0^{+2.1}_{-2.1}$            | $\chi_{CMB}^2$              | 11931.3  | $11947.7 (\nu: 19.7)$        |
| $\sigma_8$                  | 0.8200   | $0.820^{+0.019}_{-0.019}$       | $D_M(0.15)$                 | 622.6    | $623^{+18}_{-17}$               | $\chi_{BAO}^2$              | 5.33     | $5.79 (\nu: 0.2)$            |
| $S_8$                       | 0.8216   | $0.822^{+0.022}_{-0.021}$       | $H(0.38)$                   | 85.11    | $85.1^{+2.1}_{-2.1}$            |                             |          |                              |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4500   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1487.3   | $1488^{+41}_{-39}$              |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12978.85$ ;  $\bar{\chi}_{eff}^2 = 13001.59$ ;  $\Delta\chi_{eff}^2 = -2.05$ ;  $R - 1 = 0.02251$

$\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.89 DR12BAO: 3.43 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 9.46 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.28 commander\_dx12\_v3.2.29: 21.82 CamSpec like\_10.7HM.1400\_unified: 11503.77 Hubble - H073p45: 5.08 SN - JLA Pantheon18: 1034.74



### 6.31 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02261^{+0.00037}_{-0.00036}$ | $S_8$                                | $0.815^{+0.031}_{-0.030}$       | $H(0.15)$                   | $75.5^{+2.4}_{-2.4}$         |
| $\Omega_{\mathrm{c}}h^2$               | $0.1231^{+0.0060}_{-0.0061}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.446^{+0.017}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $618^{+21}_{-20}$            |
| $100\theta_{\mathrm{MC}}$              | $1.04054^{+0.00083}_{-0.00080}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.017}_{-0.017}$       | $H(0.38)$                   | $85.6^{+2.4}_{-2.4}$         |
| $\tau$                                 | $0.056^{+0.014}_{-0.013}$       | $\sigma_8/h^{0.5}$                   | $0.978^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.38)$      | $1478^{+47}_{-45}$           |
| $N_{\mathrm{eff}}$                     | $3.38^{+0.35}_{-0.36}$          | $r_{\mathrm{drag}}h$                 | $101.4^{+2.2}_{-2.1}$           | $H(0.51)$                   | $92.3^{+2.4}_{-2.5}$         |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.055^{+0.033}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$          | $2.401^{+0.054}_{-0.053}$       | $D_{\mathrm{M}}(0.51)$      | $1917^{+59}_{-56}$           |
| $n_{\mathrm{s}}$                       | $0.981^{+0.013}_{-0.014}$       | $z_{\mathrm{re}}$                    | $7.9^{+1.2}_{-1.4}$             | $H(0.61)$                   | $97.9^{+2.5}_{-2.5}$         |
| $y_{\mathrm{cal}}$                     | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_{\mathrm{s}}$                | $2.123^{+0.070}_{-0.067}$       | $D_{\mathrm{M}}(0.61)$      | $2233^{+68}_{-64}$           |
| $A_{100}^{\mathrm{PS}}$                | $247^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.896^{+0.033}_{-0.034}$       | $H(2.33)$                   | $239.9^{+5.1}_{-5.2}$        |
| $A_{143}^{\mathrm{PS}}$                | $43^{+20}_{-20}$                | $D_{40}$                             | $1207^{+28}_{-26}$              | $D_{\mathrm{M}}(2.33)$      | $5620^{+140}_{-140}$         |
| $A_{217}^{\mathrm{PS}}$                | $101^{+30}_{-30}$               | $D_{220}$                            | $5726^{+80}_{-76}$              | $f\sigma_8(0.15)$           | $0.452^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$               | $42^{+10}_{-10}$                | $D_{810}$                            | $2539^{+28}_{-27}$              | $\sigma_8(0.15)$            | $0.759^{+0.020}_{-0.019}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.36$                        | $D_{1420}$                           | $815^{+10}_{-9.9}$              | $f\sigma_8(0.38)$           | $0.474^{+0.014}_{-0.014}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.25}_{-0.24}$          | $D_{2000}$                           | $228.7^{+3.9}_{-3.9}$           | $\sigma_8(0.38)$            | $0.674^{+0.018}_{-0.018}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $n_{\mathrm{s},0.002}$               | $0.981^{+0.013}_{-0.014}$       | $f\sigma_8(0.51)$           | $0.474^{+0.013}_{-0.013}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}$                     | $0.2499^{+0.0045}_{-0.0047}$    | $\sigma_8(0.51)$            | $0.632^{+0.017}_{-0.017}$    |
| $A^{\mathrm{kSZ}}$                     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.2512^{+0.0045}_{-0.0048}$    | $f\sigma_8(0.61)$           | $0.471^{+0.013}_{-0.013}$    |
| $A_{100}^{\mathrm{dust}}$              | $1.02^{+0.38}_{-0.39}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.66^{+0.10}_{-0.10}$          | $\sigma_8(0.61)$            | $0.601^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.46^{+0.34}_{-0.32}$         | $f\sigma_8(2.33)$           | $0.3038^{+0.0083}_{-0.0082}$ |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $z_*$                                | $1090.21^{+0.76}_{-0.77}$       | $\sigma_8(2.33)$            | $0.3140^{+0.0089}_{-0.0088}$ |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.32}$          | $r_*$                                | $141.8^{+3.3}_{-3.1}$           | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                        | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{217}$            | $108.4^{+4.2}_{-4.2}$        |
| $c_{217}$                              | $1.0013^{+0.0031}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.63^{+0.31}_{-0.29}$         | $f_{2000}^{143\times 217}$  | $34^{+5}_{-5}$               |
| $c_{TE}$                               | $0.9989^{+0.0098}_{-0.0098}$    | $z_{\mathrm{drag}}$                  | $1061.0^{+1.2}_{-1.3}$          | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.8)$           |
| $c_{EE}$                               | $0.997^{+0.011}_{-0.011}$       | $r_{\mathrm{drag}}$                  | $144.4^{+3.5}_{-3.2}$           | $\chi_{\mathrm{lowl}}^2$    | $21.54 (\nu: 0.3)$           |
| $H_0$                                  | $70.2^{+2.4}_{-2.4}$            | $k_{\mathrm{D}}$                     | $0.1427^{+0.0024}_{-0.0025}$    | $\chi_{\mathrm{CamSpec}}^2$ | $11520.6 (\nu: 21.8)$        |
| $\Omega_{\Lambda}$                     | $0.703^{+0.016}_{-0.016}$       | $100\theta_{\mathrm{D}}$             | $0.16153^{+0.00084}_{-0.00087}$ | $\chi_{\mathrm{H073p45}}^2$ | $4.3 (\nu: 4.5)$             |
| $\Omega_{\mathrm{m}}$                  | $0.297^{+0.016}_{-0.016}$       | $z_{\mathrm{eq}}$                    | $3332^{+61}_{-60}$              | $\chi_{\mathrm{prior}}^2$   | $7.9 (\nu: 6.3)$             |
| $\Omega_{\mathrm{m}}h^2$               | $0.1464^{+0.0062}_{-0.0062}$    | $k_{\mathrm{eq}}$                    | $0.01040^{+0.00025}_{-0.00024}$ | $\chi_{\mathrm{CMB}}^2$     | $11939.3 (\nu: 20.6)$        |
| $\Omega_{\mathrm{m}}h^3$               | $0.1029^{+0.0072}_{-0.0071}$    | $100\theta_{\mathrm{eq}}$            | $0.827^{+0.012}_{-0.012}$       |                             |                              |
| $\sigma_8$                             | $0.819^{+0.021}_{-0.021}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4563^{+0.0061}_{-0.0061}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11951.46; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.54; R - 1 = 0.01420$$



### 6.32 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02256^{+0.00032}_{-0.00033}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.449^{+0.015}_{-0.014}$       | $H(0.38)$                   | $85.2^{+2.2}_{-2.2}$         |
| $\Omega_{\text{c}} h^2$              | $0.1232^{+0.0062}_{-0.0062}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.607^{+0.017}_{-0.016}$       | $D_{\text{M}}(0.38)$        | $1485^{+43}_{-40}$           |
| $100\theta_{\text{MC}}$              | $1.04052^{+0.00086}_{-0.00079}$ | $\sigma_8/h^{0.5}$                  | $0.981^{+0.021}_{-0.019}$       | $H(0.51)$                   | $92.0^{+2.3}_{-2.3}$         |
| $\tau$                               | $0.056^{+0.014}_{-0.013}$       | $r_{\text{drag}} h$                 | $101.0^{+1.6}_{-1.6}$           | $D_{\text{M}}(0.51)$        | $1926^{+54}_{-51}$           |
| $N_{\text{eff}}$                     | $3.35^{+0.35}_{-0.35}$          | $\langle d^2 \rangle^{1/2}$         | $2.408^{+0.046}_{-0.044}$       | $H(0.61)$                   | $97.6^{+2.3}_{-2.4}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.054^{+0.032}_{-0.031}$       | $z_{\text{re}}$                     | $< 9.10$                        | $D_{\text{M}}(0.61)$        | $2242^{+61}_{-58}$           |
| $n_{\text{s}}$                       | $0.979^{+0.012}_{-0.012}$       | $10^9 A_{\text{s}}$                 | $2.120^{+0.068}_{-0.065}$       | $H(2.33)$                   | $239.8^{+5.2}_{-5.3}$        |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.896^{+0.033}_{-0.035}$       | $D_{\text{M}}(2.33)$        | $5635^{+140}_{-130}$         |
| $A_{100}^{\text{PS}}$                | $246^{+50}_{-50}$               | $D_{40}$                            | $1210^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{220}$                           | $5723^{+81}_{-77}$              | $\sigma_8(0.15)$            | $0.758^{+0.020}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                           | $2539^{+28}_{-26}$              | $f\sigma_8(0.38)$           | $0.476^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $42^{+20}_{-10}$                | $D_{1420}$                          | $814^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.674^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.35$                        | $D_{2000}$                          | $228.8^{+4.0}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.476^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $n_{\text{s},0.002}$                | $0.979^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$            | $0.631^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.2495^{+0.0045}_{-0.0047}$    | $f\sigma_8(0.61)$           | $0.471^{+0.012}_{-0.012}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.2508^{+0.0045}_{-0.0047}$    | $\sigma_8(0.61)$            | $0.601^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.66^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.3033^{+0.0081}_{-0.0081}$ |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.39}_{-0.39}$          | $\text{Age}/\text{Gyr}$             | $13.49^{+0.33}_{-0.31}$         | $\sigma_8(2.33)$            | $0.3132^{+0.0086}_{-0.0085}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                               | $1090.25^{+0.75}_{-0.77}$       | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                               | $142.0^{+3.4}_{-3.2}$           | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                       | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.65^{+0.31}_{-0.29}$         | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.6)$           |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$                   | $1060.8^{+1.2}_{-1.2}$          | $\chi_{\text{lowl}}^2$      | $21.74 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9986^{+0.0094}_{-0.0098}$    | $r_{\text{drag}}$                   | $144.6^{+3.5}_{-3.3}$           | $\chi_{\text{CamSpec}}^2$   | $11519.4 (\nu: 19.8)$        |
| $c_{EE}$                             | $0.996^{+0.010}_{-0.011}$       | $k_{\text{D}}$                      | $0.1426^{+0.0024}_{-0.0026}$    | $\chi_{\text{H073p45}}^2$   | $5.1 (\nu: 4.1)$             |
| $H_0$                                | $69.8^{+2.1}_{-2.1}$            | $100\theta_{\text{D}}$              | $0.16148^{+0.00085}_{-0.00086}$ | $\chi_{6\text{DF}}^2$       | $0.037 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.700^{+0.012}_{-0.012}$       | $z_{\text{eq}}$                     | $3344^{+46}_{-46}$              | $\chi_{\text{MGS}}^2$       | $2.05 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.300^{+0.012}_{-0.012}$       | $k_{\text{eq}}$                     | $0.01041^{+0.00024}_{-0.00024}$ | $\chi_{\text{DR12BAO}}^2$   | $3.84 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1464^{+0.0063}_{-0.0063}$    | $100\theta_{\text{eq}}$             | $0.8244^{+0.0089}_{-0.0087}$    | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\Omega_{\text{m}} h^3$              | $0.1023^{+0.0071}_{-0.0070}$    | $100\theta_{\text{s,eq}}$           | $0.4550^{+0.0046}_{-0.0045}$    | $\chi_{\text{BAO}}^2$       | $5.93 (\nu: 0.4)$            |
| $\sigma_8$                           | $0.820^{+0.021}_{-0.021}$       | $H(0.15)$                           | $75.1^{+2.1}_{-2.1}$            | $\chi_{\text{CMB}}^2$       | $11938.2 (\nu: 19.1)$        |
| $S_8$                                | $0.820^{+0.026}_{-0.026}$       | $D_{\text{M}}(0.15)$                | $622^{+19}_{-17}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11957.12; R - 1 = 0.01923$$



### 6.33 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02257^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | $85.2^{+2.2}_{-2.2}$         |
| $\Omega_c h^2$                       | $0.1232^{+0.0062}_{-0.0062}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.607^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | $1485^{+42}_{-40}$           |
| $100\theta_{MC}$                     | $1.04052^{+0.00086}_{-0.00079}$ | $\sigma_8/h^{0.5}$          | $0.981^{+0.021}_{-0.019}$       | $H(0.51)$                   | $92.0^{+2.2}_{-2.3}$         |
| $\tau$                               | $0.056^{+0.014}_{-0.013}$       | $r_{\text{drag}} h$         | $101.0^{+1.5}_{-1.5}$           | $D_M(0.51)$                 | $1925^{+52}_{-50}$           |
| $N_{\text{eff}}$                     | $3.36^{+0.35}_{-0.35}$          | $\langle d^2 \rangle^{1/2}$ | $2.408^{+0.046}_{-0.044}$       | $H(0.61)$                   | $97.6^{+2.3}_{-2.4}$         |
| $\ln(10^{10} A_s)$                   | $3.054^{+0.032}_{-0.031}$       | $z_{\text{re}}$             | $< 9.10$                        | $D_M(0.61)$                 | $2242^{+60}_{-57}$           |
| $n_s$                                | $0.979^{+0.012}_{-0.012}$       | $10^9 A_s$                  | $2.120^{+0.068}_{-0.065}$       | $H(2.33)$                   | $239.8^{+5.2}_{-5.3}$        |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.896^{+0.033}_{-0.035}$       | $D_M(2.33)$                 | $5634^{+140}_{-130}$         |
| $A_{100}^{\text{PS}}$                | $246^{+50}_{-50}$               | $D_{40}$                    | $1210^{+26}_{-24}$              | $f\sigma_8(0.15)$           | $0.454^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{220}$                   | $5723^{+81}_{-77}$              | $\sigma_8(0.15)$            | $0.758^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{810}$                   | $2539^{+28}_{-26}$              | $f\sigma_8(0.38)$           | $0.476^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $42^{+20}_{-10}$                | $D_{1420}$                  | $814^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.674^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $D_{2000}$                  | $228.8^{+4.0}_{-4.0}$           | $f\sigma_8(0.51)$           | $0.475^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $n_{s,0.002}$               | $0.979^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$            | $0.631^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2495^{+0.0045}_{-0.0046}$    | $f\sigma_8(0.61)$           | $0.471^{+0.012}_{-0.012}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2508^{+0.0045}_{-0.0047}$    | $\sigma_8(0.61)$            | $0.601^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D/H}$           | $2.66^{+0.10}_{-0.10}$          | $f\sigma_8(2.33)$           | $0.3033^{+0.0081}_{-0.0081}$ |
| $A_{100}^{\text{dust}}$              | $1.02^{+0.39}_{-0.39}$          | Age/Gyr                     | $13.49^{+0.33}_{-0.31}$         | $\sigma_8(2.33)$            | $0.3132^{+0.0086}_{-0.0085}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                       | $1090.24^{+0.75}_{-0.77}$       | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $142.0^{+3.4}_{-3.2}$           | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.4}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.0405^{+0.0010}_{-0.00096}$   | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.65^{+0.31}_{-0.29}$         | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.7)$           |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1060.9^{+1.2}_{-1.2}$          | $\chi_{\text{lowl}}^2$      | $21.73 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9986^{+0.0094}_{-0.0098}$    | $r_{\text{drag}}$           | $144.6^{+3.4}_{-3.3}$           | $\chi_{\text{CamSpec}}^2$   | $11519.4 (\nu: 19.8)$        |
| $c_{EE}$                             | $0.996^{+0.010}_{-0.011}$       | $k_D$                       | $0.1426^{+0.0024}_{-0.0026}$    | $\chi_{\text{H073p45}}^2$   | $5.1 (\nu: 3.9)$             |
| $H_0$                                | $69.9^{+2.0}_{-2.1}$            | $100\theta_D$               | $0.16148^{+0.00084}_{-0.00086}$ | $\chi_{\text{JLA}}^2$       | $1034.81 (\nu: 0.0)$         |
| $\Omega_\Lambda$                     | $0.700^{+0.011}_{-0.012}$       | $z_{\text{eq}}$             | $3344^{+45}_{-45}$              | $\chi_{6\text{DF}}^2$       | $0.035 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.300^{+0.012}_{-0.011}$       | $k_{\text{eq}}$             | $0.01041^{+0.00023}_{-0.00024}$ | $\chi_{\text{MGS}}^2$       | $2.06 (\nu: 0.1)$            |
| $\Omega_m h^2$                       | $0.1464^{+0.0063}_{-0.0063}$    | $100\theta_{\text{eq}}$     | $0.8244^{+0.0086}_{-0.0085}$    | $\chi_{\text{DR12BAO}}^2$   | $3.81 (\nu: 0.2)$            |
| $\Omega_m h^3$                       | $0.1023^{+0.0070}_{-0.0070}$    | $100\theta_{s,\text{eq}}$   | $0.4550^{+0.0044}_{-0.0044}$    | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.820^{+0.021}_{-0.021}$       | $H(0.15)$                   | $75.1^{+2.1}_{-2.1}$            | $\chi_{\text{BAO}}^2$       | $5.90 (\nu: 0.4)$            |
| $S_8$                                | $0.820^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | $622^{+18}_{-17}$               | $\chi_{\text{CMB}}^2$       | $11938.2 (\nu: 19.0)$        |

$$\bar{\chi}_{\text{eff}}^2 = 12991.86; R - 1 = 0.01898$$



### 6.34 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02259^{+0.00037}_{-0.00035}$ | $S_8$                              | $0.820^{+0.025}_{-0.024}$       | $H(0.15)$                   | $75.2^{+2.4}_{-2.4}$         |
| $\Omega_{\text{c}}h^2$               | $0.1231^{+0.0059}_{-0.0058}$    | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.449^{+0.013}_{-0.013}$       | $D_{\text{M}}(0.15)$        | $621^{+21}_{-20}$            |
| $100\theta_{\text{MC}}$              | $1.04053^{+0.00083}_{-0.00078}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.607^{+0.014}_{-0.014}$       | $H(0.38)$                   | $85.3^{+2.4}_{-2.4}$         |
| $\tau$                               | $0.058^{+0.014}_{-0.014}$       | $\sigma_8/h^{0.5}$                 | $0.982^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.38)$        | $1483^{+47}_{-45}$           |
| $N_{\text{eff}}$                     | $3.36^{+0.35}_{-0.35}$          | $r_{\text{drag}}h$                 | $101.1^{+2.0}_{-1.9}$           | $H(0.51)$                   | $92.1^{+2.4}_{-2.4}$         |
| $\ln(10^{10}A_{\text{s}})$           | $3.059^{+0.031}_{-0.030}$       | $\langle d^2 \rangle^{1/2}$        | $2.412^{+0.043}_{-0.043}$       | $D_{\text{M}}(0.51)$        | $1923^{+59}_{-56}$           |
| $n_{\text{s}}$                       | $0.979^{+0.013}_{-0.014}$       | $z_{\text{re}}$                    | $8.1^{+1.3}_{-1.4}$             | $H(0.61)$                   | $97.7^{+2.5}_{-2.5}$         |
| $y_{\text{cal}}$                     | $1.0008^{+0.0051}_{-0.0049}$    | $10^9 A_{\text{s}}$                | $2.131^{+0.066}_{-0.064}$       | $D_{\text{M}}(0.61)$        | $2239^{+68}_{-64}$           |
| $A_{100}^{\text{PS}}$                | $247^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.897^{+0.031}_{-0.032}$       | $H(2.33)$                   | $239.8^{+5.0}_{-5.0}$        |
| $A_{143}^{\text{PS}}$                | $43^{+20}_{-20}$                | $D_{40}$                           | $1211^{+27}_{-25}$              | $D_{\text{M}}(2.33)$        | $5631^{+140}_{-140}$         |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{220}$                          | $5731^{+80}_{-76}$              | $f\sigma_8(0.15)$           | $0.455^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+20}_{-10}$                | $D_{810}$                          | $2541^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.760^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $D_{1420}$                         | $815^{+10}_{-9.6}$              | $f\sigma_8(0.38)$           | $0.476^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.24}_{-0.24}$          | $D_{2000}$                         | $228.9^{+4.0}_{-3.9}$           | $\sigma_8(0.38)$            | $0.675^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$               | $0.979^{+0.013}_{-0.014}$       | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                     | $0.2496^{+0.0045}_{-0.0047}$    | $\sigma_8(0.51)$            | $0.632^{+0.016}_{-0.015}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.2509^{+0.0045}_{-0.0047}$    | $f\sigma_8(0.61)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $10^5 \text{D/H}$                  | $2.653^{+0.098}_{-0.10}$        | $\sigma_8(0.61)$            | $0.602^{+0.015}_{-0.015}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $\text{Age/Gyr}$                   | $13.48^{+0.34}_{-0.32}$         | $f\sigma_8(2.33)$           | $0.3041^{+0.0080}_{-0.0077}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $z_*$                              | $1090.21^{+0.72}_{-0.74}$       | $\sigma_8(2.33)$            | $0.3141^{+0.0087}_{-0.0084}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                              | $142.0^{+3.2}_{-3.1}$           | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                      | $1.0405^{+0.0010}_{-0.00095}$   | $f_{2000}^{217}$            | $108.3^{+4.2}_{-4.3}$        |
| $c_{217}$                            | $1.0013^{+0.0031}_{-0.0030}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.64^{+0.30}_{-0.29}$         | $f_{2000}^{143 \times 217}$ | $34^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9985^{+0.0095}_{-0.0098}$    | $z_{\text{drag}}$                  | $1060.9^{+1.2}_{-1.2}$          | $\chi_{\text{lensing}}^2$   | $9.90 (\nu: 0.4)$            |
| $c_{EE}$                             | $0.996^{+0.010}_{-0.011}$       | $r_{\text{drag}}$                  | $144.5^{+3.3}_{-3.2}$           | $\chi_{\text{simall}}^2$    | $397.5 (\nu: 2.3)$           |
| $H_0$                                | $70.0^{+2.4}_{-2.4}$            | $k_{\text{D}}$                     | $0.1426^{+0.0024}_{-0.0024}$    | $\chi_{\text{lowl}}^2$      | $21.78 (\nu: 0.3)$           |
| $\Omega_{\Lambda}$                   | $0.701^{+0.015}_{-0.015}$       | $100\theta_{\text{D}}$             | $0.16148^{+0.00084}_{-0.00085}$ | $\chi_{\text{CamSpec}}^2$   | $11519.4 (\nu: 20.3)$        |
| $\Omega_{\text{m}}$                  | $0.299^{+0.015}_{-0.015}$       | $z_{\text{eq}}$                    | $3340^{+56}_{-57}$              | $\chi_{\text{H073p45}}^2$   | $4.9 (\nu: 5.0)$             |
| $\Omega_{\text{m}}h^2$               | $0.1463^{+0.0060}_{-0.0060}$    | $k_{\text{eq}}$                    | $0.01041^{+0.00022}_{-0.00022}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.2)$             |
| $\Omega_{\text{m}}h^3$               | $0.1024^{+0.0071}_{-0.0070}$    | $100\theta_{\text{eq}}$            | $0.825^{+0.011}_{-0.011}$       | $\chi_{\text{CMB}}^2$       | $11948.5 (\nu: 21.3)$        |
| $\sigma_8$                           | $0.821^{+0.019}_{-0.019}$       | $100\theta_{\text{s,eq}}$          | $0.4554^{+0.0057}_{-0.0055}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11961.28; \Delta\bar{\chi}_{\text{eff}}^2 = -2.23; R - 1 = 0.02116$$



### 6.35 base\_nnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Riess18\_post\_BAO\_lensing\_Pantheon18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02256^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.608^{+0.014}_{-0.014}$       | $H(0.51)$                   | $91.8^{+2.2}_{-2.2}$         |
| $\Omega_c h^2$              | $0.1230^{+0.0058}_{-0.0058}$    | $\sigma_8/h^{0.5}$          | $0.983^{+0.017}_{-0.016}$       | $D_M(0.51)$                 | $1929^{+52}_{-49}$           |
| $100\theta_{MC}$            | $1.04053^{+0.00085}_{-0.00078}$ | $r_{drag}h$                 | $100.9^{+1.5}_{-1.4}$           | $H(0.61)$                   | $97.5^{+2.3}_{-2.3}$         |
| $\tau$                      | $0.057^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$ | $2.415^{+0.038}_{-0.039}$       | $D_M(0.61)$                 | $2246^{+59}_{-57}$           |
| $N_{eff}$                   | $3.34^{+0.33}_{-0.34}$          | $z_{re}$                    | $8.0^{+1.3}_{-1.4}$             | $H(2.33)$                   | $239.7^{+4.9}_{-5.0}$        |
| $\ln(10^{10} A_s)$          | $3.057^{+0.029}_{-0.029}$       | $10^9 A_s$                  | $2.127^{+0.062}_{-0.061}$       | $D_M(2.33)$                 | $5641^{+130}_{-130}$         |
| $n_s$                       | $0.978^{+0.011}_{-0.012}$       | $10^9 A_s e^{-2\tau}$       | $1.896^{+0.031}_{-0.032}$       | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.011}$    |
| $y_{cal}$                   | $1.0007^{+0.0050}_{-0.0049}$    | $D_{40}$                    | $1213^{+26}_{-24}$              | $\sigma_8(0.15)$            | $0.759^{+0.017}_{-0.017}$    |
| $A_{100}^{PS}$              | $246^{+50}_{-50}$               | $D_{220}$                   | $5729^{+81}_{-76}$              | $f\sigma_8(0.38)$           | $0.477^{+0.011}_{-0.011}$    |
| $A_{143}^{PS}$              | $43^{+20}_{-20}$                | $D_{810}$                   | $2540^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.674^{+0.016}_{-0.016}$    |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-9.6}$              | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $A_{217}^{CIB}$             | $41^{+20}_{-10}$                | $D_{2000}$                  | $229.0^{+4.0}_{-3.9}$           | $\sigma_8(0.51)$            | $0.632^{+0.015}_{-0.015}$    |
| $A_{143}^{tSZ}$             | $< 7.35$                        | $n_{s,0.002}$               | $0.978^{+0.011}_{-0.012}$       | $f\sigma_8(0.61)$           | $0.472^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{PS}$   | $0.65^{+0.24}_{-0.24}$          | $Y_P$                       | $0.2493^{+0.0043}_{-0.0045}$    | $\sigma_8(0.61)$            | $0.601^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $Y_P^{BBN}$                 | $0.2506^{+0.0043}_{-0.0045}$    | $f\sigma_8(2.33)$           | $0.3035^{+0.0074}_{-0.0074}$ |
| $\xi^{tSZ \times CIB}$      | —                               | $10^5 D/H$                  | $2.652^{+0.099}_{-0.10}$        | $\sigma_8(2.33)$            | $0.3134^{+0.0079}_{-0.0078}$ |
| $A^{kSZ}$                   | —                               | Age/Gyr                     | $13.51^{+0.31}_{-0.30}$         | $f_{2000}^{143}$            | $32^{+6}_{-6}$               |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | $1090.23^{+0.71}_{-0.75}$       | $f_{2000}^{217}$            | $108.2^{+4.2}_{-4.4}$        |
| $A_{143}^{dust}$            | $0.96^{+0.34}_{-0.34}$          | $r_*$                       | $142.1^{+3.2}_{-3.0}$           | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-4}$               |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.0405^{+0.0010}_{-0.00095}$   | $\chi_{lensing}^2$          | $9.77 (\nu: 0.3)$            |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/Gpc$              | $13.66^{+0.30}_{-0.28}$         | $\chi_{simall}^2$           | $397.3 (\nu: 1.9)$           |
| $c_{100}$                   | $0.9976^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | $1060.8^{+1.2}_{-1.2}$          | $\chi_{lowl}^2$             | $21.89 (\nu: 0.3)$           |
| $c_{217}$                   | $1.0013^{+0.0031}_{-0.0030}$    | $r_{drag}$                  | $144.7^{+3.3}_{-3.1}$           | $\chi_{CamSpec}^2$          | $11518.7 (\nu: 19.2)$        |
| $c_{TE}$                    | $0.9984^{+0.0094}_{-0.0098}$    | $k_D$                       | $0.1425^{+0.0024}_{-0.0024}$    | $\chi_{H073p45}^2$          | $5.5 (\nu: 4.1)$             |
| $c_{EE}$                    | $0.996^{+0.010}_{-0.011}$       | $100\theta_D$               | $0.16144^{+0.00082}_{-0.00085}$ | $\chi_{JLA}^2$              | $1034.81 (\nu: 0.0)$         |
| $H_0$                       | $69.7^{+2.0}_{-2.0}$            | $z_{eq}$                    | $3347^{+42}_{-42}$              | $\chi_{6DF}^2$              | $0.029 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | $0.699^{+0.011}_{-0.011}$       | $k_{eq}$                    | $0.01041^{+0.00022}_{-0.00022}$ | $\chi_{MGS}^2$              | $1.98 (\nu: 0.1)$            |
| $\Omega_m$                  | $0.301^{+0.011}_{-0.011}$       | $100\theta_{eq}$            | $0.8237^{+0.0082}_{-0.0081}$    | $\chi_{DR12BAO}^2$          | $3.78 (\nu: 0.1)$            |
| $\Omega_m h^2$              | $0.1462^{+0.0059}_{-0.0060}$    | $100\theta_{s,eq}$          | $0.4547^{+0.0042}_{-0.0042}$    | $\chi_{prior}^2$            | $7.8 (\nu: 6.1)$             |
| $\Omega_m h^3$              | $0.1020^{+0.0069}_{-0.0067}$    | $H(0.15)$                   | $75.0^{+2.0}_{-2.0}$            | $\chi_{CMB}^2$              | $11947.6 (\nu: 19.4)$        |
| $\sigma_8$                  | $0.821^{+0.019}_{-0.019}$       | $D_M(0.15)$                 | $623^{+18}_{-17}$               | $\chi_{BAO}^2$              | $5.79 (\nu: 0.2)$            |
| $S_8$                       | $0.822^{+0.022}_{-0.021}$       | $H(0.38)$                   | $85.1^{+2.1}_{-2.1}$            |                             |                              |
| $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1488^{+41}_{-39}$              |                             |                              |

$$\bar{\chi}_{eff}^2 = 13001.46; \Delta\bar{\chi}_{eff}^2 = -2.07; R - 1 = 0.02255$$



## 7 nnu+meffsterile

### 7.1 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter  | Best fit | 95% limits                      | Parameter                             | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--|----------|---------------------------------|---------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                                | 0.022298 | $0.02237^{+0.00034}_{-0.00032}$ | $\Omega_{\mathrm{m}} h^3$             | 0.09691  | $0.0981^{+0.0041}_{-0.0025}$    | $100\theta_{\mathrm{eq}}$   | 0.8160   | $0.827^{+0.028}_{-0.020}$ |
| $\Omega_{\mathrm{c}} h^2$                                | 0.1202   | $0.1198^{+0.0065}_{-0.0072}$    | $\sigma_8$                            | 0.8114   | $0.778^{+0.045}_{-0.054}$       | $100\theta_{\mathrm{s,eq}}$ | 0.4508   | $0.456^{+0.014}_{-0.011}$ |
| $100\theta_{\mathrm{MC}}$                                | 1.04084  | $1.04068^{+0.00066}_{-0.00073}$ | $S_8$                                 | 0.8281   | $0.805^{+0.045}_{-0.049}$       | $H(0.15)$                   | 73.00    | $72.8^{+1.7}_{-1.5}$      |
| $\tau$   | 0.0547   | $0.053^{+0.017}_{-0.015}$       | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | 0.4536   | $0.441^{+0.025}_{-0.027}$       | $D_{\mathrm{M}}(0.15)$      | 640.4    | $643^{+15}_{-16}$         |
| $m_{\nu, \mathrm{sterile}}^{\mathrm{eff}} [\mathrm{eV}]$ | 0.001    | $< 0.749$                       | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | 0.6067   | $0.586^{+0.032}_{-0.037}$       | $H(0.38)$                   | 83.15    | $83.1^{+1.5}_{-1.1}$      |
| $N_{\mathrm{eff}}$                                       | 3.089    | $< 3.39$                        | $\sigma_8/h^{0.5}$                    | 0.986    | $0.948^{+0.050}_{-0.061}$       | $D_{\mathrm{M}}(0.38)$      | 1527.0   | $1531^{+29}_{-34}$        |
| $\ln(10^{10} A_{\mathrm{s}})$                            | 3.0445   | $3.043^{+0.035}_{-0.033}$       | $r_{\mathrm{drag}} h$                 | 99.44    | $98.3^{+2.8}_{-3.0}$            | $H(0.51)$                   | 89.90    | $90.0^{+1.5}_{-1.0}$      |
| $n_{\mathrm{s}}$   | 0.9671   | $0.967^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | 2.437    | $2.430^{+0.058}_{-0.057}$       | $D_{\mathrm{M}}(0.51)$      | 1978.0   | $1982^{+35}_{-42}$        |
| $y_{\mathrm{cal}}$                                       | 1.00062  | $1.0005^{+0.0049}_{-0.0050}$    | $z_{\mathrm{re}}$                     | 7.75     | $7.6^{+1.6}_{-1.7}$             | $H(0.61)$                   | 95.54    | $95.7^{+1.4}_{-0.95}$     |
| $A_{100}^{\mathrm{PS}}$                                  | 238.8    | $244^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | 2.100    | $2.096^{+0.075}_{-0.068}$       | $D_{\mathrm{M}}(0.61)$      | 2301.5   | $2305^{+38}_{-46}$        |
| $A_{143}^{\mathrm{PS}}$                                  | 44.7     | $42^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | 1.8822   | $1.886^{+0.029}_{-0.026}$       | $H(2.33)$                   | 236.77   | $238.6^{+4.2}_{-3.4}$     |
| $A_{217}^{\mathrm{PS}}$                                  | 102.0    | $101^{+30}_{-30}$               | $D_{40}$                              | 1225.7   | $1222^{+29}_{-29}$              | $D_{\mathrm{M}}(2.33)$      | 5749     | $5734^{+52}_{-81}$        |
| $A_{217}^{\mathrm{CIB}}$                                 | 42.1     | $41^{+10}_{-10}$                | $D_{220}$                             | 5719     | $5717^{+78}_{-80}$              | $f\sigma_8(0.15)$           | 0.4581   | $0.445^{+0.024}_{-0.027}$ |
| $A_{143}^{\mathrm{tSZ}}$                                 | 4.79     | $< 7.38$                        | $D_{810}$                             | 2536.7   | $2536^{+27}_{-28}$              | $\sigma_8(0.15)$            | 0.7497   | $0.718^{+0.042}_{-0.050}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$                       | 0.682    | $0.65^{+0.24}_{-0.24}$          | $D_{1420}$                            | 815.3    | $814.4^{+9.7}_{-9.8}$           | $f\sigma_8(0.38)$           | 0.4762   | $0.460^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$                      | 0.70     | —                               | $D_{2000}$                            | 229.99   | $229.0^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | 0.6645   | $0.636^{+0.038}_{-0.046}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$                 | 0.55     | —                               | $n_{\mathrm{s}, 0.002}$               | 0.9671   | $0.967^{+0.013}_{-0.011}$       | $f\sigma_8(0.51)$           | 0.4747   | $0.458^{+0.025}_{-0.029}$ |
| $A^{\mathrm{kSZ}}$                                       | 3.0      | —                               | $Y_{\mathrm{P}}$                      | 0.24594  | $0.2471^{+0.0029}_{-0.0018}$    | $\sigma_8(0.51)$            | 0.6218   | $0.595^{+0.036}_{-0.043}$ |
| $A_{100}^{\mathrm{dust}}$                                | 1.006    | $1.01^{+0.38}_{-0.38}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | 0.24727  | $0.2484^{+0.0029}_{-0.0018}$    | $f\sigma_8(0.61)$           | 0.4697   | $0.453^{+0.025}_{-0.029}$ |
| $A_{143}^{\mathrm{dust}}$                                | 0.969    | $0.97^{+0.34}_{-0.35}$          | $10^5 \mathrm{D}/\mathrm{H}$          | 2.614    | $2.632^{+0.084}_{-0.076}$       | $\sigma_8(0.61)$            | 0.5916   | $0.566^{+0.035}_{-0.042}$ |
| $A_{217}^{\mathrm{dust}}$                                | 0.966    | $0.97^{+0.20}_{-0.20}$          | $\mathrm{Age}/\mathrm{Gyr}$           | 13.763   | $13.73^{+0.12}_{-0.19}$         | $f\sigma_8(2.33)$           | 0.2983   | $0.285^{+0.018}_{-0.021}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$                     | 1.021    | $1.03^{+0.32}_{-0.32}$          | $z_*$                                 | 1090.07  | $1090.25^{+0.75}_{-0.65}$       | $\sigma_8(2.33)$            | 0.3075   | $0.293^{+0.019}_{-0.023}$ |
| $c_{100}$  | 0.99762  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                                 | 144.22   | $143.3^{+1.7}_{-2.2}$           | $f_{2000}^{143}$            | 30.6     | $31^{+6}_{-6}$            |
| $c_{217}$  | 1.00124  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_*$                         | 1.04101  | $1.04080^{+0.00073}_{-0.00079}$ | $f_{2000}^{217}$            | 107.24   | $108.0^{+4.2}_{-3.9}$     |
| $c_{TE}$   | 0.9969   | $0.9975^{+0.010}_{-0.0097}$     | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | 13.853   | $13.77^{+0.15}_{-0.21}$         | $f_{2000}^{143 \times 217}$ | 32.81    | $34^{+4}_{-4}$            |
| $c_{EE}$   | 0.9933   | $0.993^{+0.010}_{-0.010}$       | $z_{\mathrm{drag}}$                   | 1059.82  | $1060.19^{+0.98}_{-0.89}$       | $\chi_{\mathrm{simall}}^2$  | 396.18   | $397.0 (\nu: 1.6)$        |
| $H_0$  | 67.69    | $67.4^{+1.8}_{-1.7}$            | $r_{\mathrm{drag}}$                   | 146.90   | $146.0^{+1.7}_{-2.3}$           | $\chi_{\mathrm{lowl}}^2$    | 23.00    | $22.9 (\nu: 0.6)$         |
| $\Omega_{\Lambda}$                                       | 0.6876   | $0.679^{+0.023}_{-0.024}$       | $k_{\mathrm{D}}$                      | 0.14085  | $0.1416^{+0.0018}_{-0.0015}$    | $\chi_{\mathrm{CamSpec}}^2$ | 11500.0  | $11517.5 (\nu: 18.9)$     |
| $\Omega_{\mathrm{m}}$                                    | 0.3124   | $0.321^{+0.024}_{-0.023}$       | $100\theta_{\mathrm{D}}$              | 0.16101  | $0.16107^{+0.00065}_{-0.00055}$ | $\chi_{\mathrm{prior}}^2$   | 2.2      | $7.9 (\nu: 6.2)$          |
| $\Omega_{\mathrm{m}} h^2$                                | 0.1432   | $0.1457^{+0.0057}_{-0.0049}$    | $z_{\mathrm{eq}}$                     | 3386     | $3339^{+100}_{-130}$            | $\chi_{\mathrm{CMB}}^2$     | 11919.1  | $11937.4 (\nu: 19.1)$     |
| $\Omega_{\nu} h^2$                                       | 0.00065  | $0.0035^{+0.0052}_{-0.0030}$    | $k_{\mathrm{eq}}$                     | 0.010364 | $0.01031^{+0.00031}_{-0.00037}$ |                             |          |                           |

Best-fit  $\chi_{\mathrm{eff}}^2 = 11921.37$ ;  $\Delta\chi_{\mathrm{eff}}^2 = 0.61$ ;  $\bar{\chi}_{\mathrm{eff}}^2 = 11945.34$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 2.88$ ;  $R - 1 = 0.02481$

$\chi_{\mathrm{eff}}^2$ : CMB - simall.100x143\_offlike5\_EE\_Aplanck\_B: 396.18 ( $\Delta$  0.28) commander\_dx12\_v3.2.29: 23.00 ( $\Delta$  0.00) CamSpec like\_10.7HM.1400\_unified: 11499.96 ( $\Delta$  0.31)



## 7.2 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter   | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                 |
|---|---------------------------------|--------------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$  | $0.02234^{+0.00033}_{-0.00031}$ | $\Omega_m h^3$                 | $0.0980^{+0.0038}_{-0.0024}$    | $100\theta_{\text{eq}}$     | $0.824^{+0.025}_{-0.018}$  |
| $\Omega_c h^2$  | $0.1201^{+0.0057}_{-0.0072}$    | $\sigma_8$                     | $0.783^{+0.038}_{-0.044}$       | $100\theta_{\text{s,eq}}$   | $0.455^{+0.013}_{-0.0092}$ |
| $100\theta_{\text{MC}}$   | $1.04066^{+0.00065}_{-0.00071}$ | $S_8$                          | $0.812^{+0.035}_{-0.039}$       | $H(0.15)$                   | $72.7^{+1.6}_{-1.4}$       |
| $\tau$  | $0.054^{+0.016}_{-0.014}$       | $\sigma_8 \Omega_m^{0.5}$      | $0.445^{+0.019}_{-0.021}$       | $D_{\text{M}}(0.15)$        | $644^{+14}_{-15}$          |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$  | $< 0.681$                       | $\sigma_8 \Omega_m^{0.25}$     | $0.590^{+0.025}_{-0.029}$       | $H(0.38)$                   | $83.0^{+1.4}_{-1.1}$       |
| $N_{\text{eff}}$  | $< 3.37$                        | $\sigma_8/h^{0.5}$             | $0.955^{+0.040}_{-0.048}$       | $D_{\text{M}}(0.38)$        | $1534^{+28}_{-32}$         |
| $\ln(10^{10} A_s)$  | $3.047^{+0.032}_{-0.030}$       | $r_{\text{drag}} h$            | $98.1^{+2.5}_{-2.9}$            | $H(0.51)$                   | $89.9^{+1.4}_{-0.93}$      |
| $n_s$   | $0.966^{+0.012}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$    | $2.441^{+0.046}_{-0.046}$       | $D_{\text{M}}(0.51)$        | $1985^{+33}_{-39}$         |
| $y_{\text{cal}}$  | $1.0007^{+0.0050}_{-0.0049}$    | $z_{\text{re}}$                | $7.7^{+1.6}_{-1.5}$             | $H(0.61)$                   | $95.6^{+1.3}_{-0.87}$      |
| $A_{100}^{\text{PS}}$   | $244^{+50}_{-50}$               | $10^9 A_s$                     | $2.105^{+0.069}_{-0.062}$       | $D_{\text{M}}(0.61)$        | $2309^{+36}_{-43}$         |
| $A_{143}^{\text{PS}}$   | $42^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | $1.888^{+0.028}_{-0.025}$       | $H(2.33)$                   | $238.6^{+3.9}_{-3.2}$      |
| $A_{217}^{\text{PS}}$   | $102^{+30}_{-30}$               | $D_{40}$                       | $1226^{+26}_{-26}$              | $D_{\text{M}}(2.33)$        | $5739^{+48}_{-77}$         |
| $A_{217}^{\text{CIB}}$  | $41^{+10}_{-10}$                | $D_{220}$                      | $5720^{+78}_{-79}$              | $f\sigma_8(0.15)$           | $0.449^{+0.019}_{-0.021}$  |
| $A_{143}^{\text{tSZ}}$  | $< 7.37$                        | $D_{810}$                      | $2538^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.723^{+0.036}_{-0.042}$  |
| $r_{143 \times 217}^{\text{PS}}$  | $0.66^{+0.24}_{-0.25}$          | $D_{1420}$                     | $814.7^{+9.9}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.464^{+0.020}_{-0.023}$  |
| $r_{143 \times 217}^{\text{CIB}}$   | —                               | $D_{2000}$                     | $229.2^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | $0.639^{+0.033}_{-0.038}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$  | —                               | $n_{\text{s}, 0.002}$          | $0.966^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.461^{+0.020}_{-0.023}$  |
| $A^{\text{kSZ}}$  | —                               | $Y_{\text{P}}$                 | $0.2470^{+0.0028}_{-0.0017}$    | $\sigma_8(0.51)$            | $0.598^{+0.031}_{-0.036}$  |
| $A_{100}^{\text{dust}}$   | $1.01^{+0.38}_{-0.37}$          | $Y_{\text{P}}^{\text{BBN}}$    | $0.2483^{+0.0028}_{-0.0017}$    | $f\sigma_8(0.61)$           | $0.456^{+0.020}_{-0.023}$  |
| $A_{143}^{\text{dust}}$   | $0.97^{+0.33}_{-0.35}$          | $10^5 \text{D}/\text{H}$       | $2.632^{+0.081}_{-0.074}$       | $\sigma_8(0.61)$            | $0.569^{+0.030}_{-0.035}$  |
| $A_{217}^{\text{dust}}$   | $0.97^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | $13.74^{+0.11}_{-0.18}$         | $f\sigma_8(2.33)$           | $0.287^{+0.016}_{-0.018}$  |
| $A_{143 \times 217}^{\text{dust}}$  | $1.03^{+0.32}_{-0.32}$          | $z_*$                          | $1090.28^{+0.69}_{-0.65}$       | $\sigma_8(2.33)$            | $0.295^{+0.017}_{-0.019}$  |
| $c_{100}$   | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                          | $143.4^{+1.5}_{-2.1}$           | $f_{2000}^{143}$            | $31^{+6}_{-6}$             |
| $c_{217}$   | $1.0012^{+0.0031}_{-0.0030}$    | $100\theta_*$                  | $1.04079^{+0.00071}_{-0.00076}$ | $f_{2000}^{217}$            | $108.0^{+4.2}_{-3.8}$      |
| $c_{TE}$  | $0.9972^{+0.010}_{-0.0097}$     | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.77^{+0.14}_{-0.19}$         | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$             |
| $c_{EE}$  | $0.993^{+0.010}_{-0.0099}$      | $z_{\text{drag}}$              | $1060.14^{+0.92}_{-0.84}$       | $\chi_{\text{lensing}}^2$   | $9.25 (\nu: 0.4)$          |
| $H_0$   | $67.2^{+1.7}_{-1.6}$            | $r_{\text{drag}}$              | $146.0^{+1.6}_{-2.1}$           | $\chi_{\text{small}}^2$     | $397.1 (\nu: 1.8)$         |
| $\Omega_{\Lambda}$  | $0.677^{+0.021}_{-0.023}$       | $k_{\text{D}}$                 | $0.1416^{+0.0017}_{-0.0014}$    | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.5)$          |
| $\Omega_{\text{m}}$   | $0.323^{+0.023}_{-0.021}$       | $100\theta_{\text{D}}$         | $0.16106^{+0.00063}_{-0.00053}$ | $\chi_{\text{CamSpec}}^2$   | $11516.6 (\nu: 17.1)$      |
| $\Omega_{\text{m}} h^2$   | $0.1458^{+0.0054}_{-0.0045}$    | $z_{\text{eq}}$                | $3351^{+87}_{-120}$             | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$           |
| $\Omega_{\nu} h^2$  | $0.0033^{+0.0049}_{-0.0028}$    | $k_{\text{eq}}$                | $0.01034^{+0.00028}_{-0.00034}$ | $\chi_{\text{CMB}}^2$       | $11946.1 (\nu: 18.6)$      |
| $\bar{\chi}_{\text{eff}}^2 = 11954.00; \Delta\bar{\chi}_{\text{eff}}^2 = 2.56; R - 1 = 0.02353$ |                                 |                                |                                 |                             |                            |



### 7.3 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02237^{+0.00034}_{-0.00032}$ | $\Omega_m h^3$                 | $0.0982^{+0.0041}_{-0.0025}$    | $100\theta_{\text{eq}}$     | $0.827^{+0.027}_{-0.020}$ |
| $\Omega_c h^2$                                     | $0.1198^{+0.0065}_{-0.0072}$    | $\sigma_8$                     | $0.779^{+0.044}_{-0.053}$       | $100\theta_{\text{s,eq}}$   | $0.456^{+0.014}_{-0.011}$ |
| $100\theta_{\text{MC}}$                            | $1.04068^{+0.00066}_{-0.00073}$ | $S_8$                          | $0.806^{+0.045}_{-0.049}$       | $H(0.15)$                   | $72.8^{+1.7}_{-1.5}$      |
| $\tau$   | $0.054^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.5}$      | $0.441^{+0.024}_{-0.027}$       | $D_{\text{M}}(0.15)$        | $643^{+15}_{-16}$         |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.746$                       | $\sigma_8 \Omega_m^{0.25}$     | $0.586^{+0.031}_{-0.037}$       | $H(0.38)$                   | $83.2^{+1.5}_{-1.1}$      |
| $N_{\text{eff}}$                                   | $< 3.39$                        | $\sigma_8/h^{0.5}$             | $0.949^{+0.050}_{-0.061}$       | $D_{\text{M}}(0.38)$        | $1531^{+30}_{-34}$        |
| $\ln(10^{10} A_{\text{s}})$                        | $3.046^{+0.030}_{-0.028}$       | $r_{\text{drag}} h$            | $98.4^{+2.9}_{-3.0}$            | $H(0.51)$                   | $90.0^{+1.5}_{-1.0}$      |
| $n_{\text{s}}$                                     | $0.968^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$    | $2.433^{+0.056}_{-0.056}$       | $D_{\text{M}}(0.51)$        | $1981^{+35}_{-42}$        |
| $y_{\text{cal}}$                                   | $1.0005^{+0.0049}_{-0.0051}$    | $z_{\text{re}}$                | $< 8.94$                        | $H(0.61)$                   | $95.7^{+1.4}_{-0.95}$     |
| $A_{100}^{\text{PS}}$                              | $244^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | $2.102^{+0.064}_{-0.058}$       | $D_{\text{M}}(0.61)$        | $2304^{+38}_{-46}$        |
| $A_{143}^{\text{PS}}$                              | $42^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.886^{+0.029}_{-0.026}$       | $H(2.33)$                   | $238.6^{+4.2}_{-3.5}$     |
| $A_{217}^{\text{PS}}$                              | $101^{+30}_{-30}$               | $D_{40}$                       | $1222^{+29}_{-29}$              | $D_{\text{M}}(2.33)$        | $5733^{+53}_{-81}$        |
| $A_{217}^{\text{CIB}}$                             | $41^{+10}_{-10}$                | $D_{220}$                      | $5717^{+78}_{-79}$              | $f\sigma_8(0.15)$           | $0.445^{+0.024}_{-0.027}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.38$                        | $D_{810}$                      | $2536^{+27}_{-28}$              | $\sigma_8(0.15)$            | $0.719^{+0.042}_{-0.050}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.24}_{-0.24}$          | $D_{1420}$                     | $814.4^{+9.9}_{-10}$            | $f\sigma_8(0.38)$           | $0.461^{+0.024}_{-0.029}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $D_{2000}$                     | $229.1^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | $0.637^{+0.038}_{-0.046}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $n_{\text{s}, 0.002}$          | $0.968^{+0.013}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.459^{+0.024}_{-0.029}$ |
| $A^{\text{kSZ}}$                                   | —                               | $Y_{\text{P}}$                 | $0.2471^{+0.0029}_{-0.0019}$    | $\sigma_8(0.51)$            | $0.595^{+0.036}_{-0.043}$ |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | $0.2485^{+0.0030}_{-0.0019}$    | $f\sigma_8(0.61)$           | $0.453^{+0.024}_{-0.029}$ |
| $A_{143}^{\text{dust}}$                            | $0.97^{+0.34}_{-0.35}$          | $10^5 \text{D}/\text{H}$       | $2.632^{+0.084}_{-0.076}$       | $\sigma_8(0.61)$            | $0.566^{+0.035}_{-0.041}$ |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | $13.72^{+0.12}_{-0.19}$         | $f\sigma_8(2.33)$           | $0.286^{+0.018}_{-0.021}$ |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $z_*$                          | $1090.24^{+0.75}_{-0.66}$       | $\sigma_8(2.33)$            | $0.294^{+0.019}_{-0.022}$ |
| $c_{100}$  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                          | $143.3^{+1.7}_{-2.2}$           | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | $1.04080^{+0.00073}_{-0.00079}$ | $f_{2000}^{217}$            | $108.0^{+4.2}_{-3.9}$     |
| $c_{TE}$   | $0.9974^{+0.010}_{-0.0097}$     | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.77^{+0.16}_{-0.21}$         | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $c_{EE}$   | $0.993^{+0.010}_{-0.010}$       | $z_{\text{drag}}$              | $1060.20^{+0.98}_{-0.89}$       | $\chi_{\text{small}}^2$     | $396.9 (\nu: 1.7)$        |
| $H_0$  | $67.4^{+1.8}_{-1.7}$            | $r_{\text{drag}}$              | $146.0^{+1.7}_{-2.3}$           | $\chi_{\text{lowl}}^2$      | $22.9 (\nu: 0.6)$         |
| $\Omega_{\Lambda}$                                 | $0.679^{+0.023}_{-0.024}$       | $k_{\text{D}}$                 | $0.1416^{+0.0018}_{-0.0015}$    | $\chi_{\text{CamSpec}}^2$   | $11517.4 (\nu: 18.8)$     |
| $\Omega_{\text{m}}$                                | $0.321^{+0.024}_{-0.023}$       | $100\theta_{\text{D}}$         | $0.16107^{+0.00065}_{-0.00055}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.2)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1457^{+0.0057}_{-0.0049}$    | $z_{\text{eq}}$                | $3339^{+100}_{-130}$            | $\chi_{\text{CMB}}^2$       | $11937.2 (\nu: 18.7)$     |
| $\Omega_{\nu} h^2$                                 | $0.0035^{+0.0052}_{-0.0030}$    | $k_{\text{eq}}$                | $0.01031^{+0.00031}_{-0.00037}$ |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11945.16; \Delta\bar{\chi}_{\text{eff}}^2 = 2.97; R - 1 = 0.02558$$



## 7.4 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter  | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                 |
|--|---------------------------------|--------------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                                     | $0.02235^{+0.00032}_{-0.00031}$ | $\Omega_m h^3$                 | $0.0980^{+0.0039}_{-0.0024}$    | $100\theta_{\text{eq}}$     | $0.824^{+0.025}_{-0.018}$  |
| $\Omega_c h^2$                                     | $0.1201^{+0.0060}_{-0.0068}$    | $\sigma_8$                     | $0.784^{+0.038}_{-0.044}$       | $100\theta_{\text{s,eq}}$   | $0.455^{+0.013}_{-0.0092}$ |
| $100\theta_{\text{MC}}$                            | $1.04066^{+0.00064}_{-0.00072}$ | $S_8$                          | $0.812^{+0.035}_{-0.039}$       | $H(0.15)$                   | $72.7^{+1.6}_{-1.4}$       |
| $\tau$   | $0.055^{+0.014}_{-0.012}$       | $\sigma_8 \Omega_m^{0.5}$      | $0.445^{+0.019}_{-0.021}$       | $D_{\text{M}}(0.15)$        | $644^{+14}_{-15}$          |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.682$                       | $\sigma_8 \Omega_m^{0.25}$     | $0.590^{+0.025}_{-0.029}$       | $H(0.38)$                   | $83.0^{+1.4}_{-1.1}$       |
| $N_{\text{eff}}$                                   | $< 3.37$                        | $\sigma_8/h^{0.5}$             | $0.955^{+0.040}_{-0.049}$       | $D_{\text{M}}(0.38)$        | $1533^{+28}_{-32}$         |
| $\ln(10^{10} A_{\text{s}})$                        | $3.049^{+0.029}_{-0.027}$       | $r_{\text{drag}} h$            | $98.2^{+2.6}_{-2.8}$            | $H(0.51)$                   | $89.9^{+1.4}_{-0.92}$      |
| $n_{\text{s}}$                                     | $0.967^{+0.012}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$    | $2.442^{+0.045}_{-0.046}$       | $D_{\text{M}}(0.51)$        | $1985^{+33}_{-39}$         |
| $y_{\text{cal}}$                                   | $1.0007^{+0.0050}_{-0.0049}$    | $z_{\text{re}}$                | $< 9.03$                        | $H(0.61)$                   | $95.6^{+1.3}_{-0.86}$      |
| $A_{100}^{\text{PS}}$                              | $244^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | $2.109^{+0.061}_{-0.056}$       | $D_{\text{M}}(0.61)$        | $2308^{+35}_{-43}$         |
| $A_{143}^{\text{PS}}$                              | $42^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.888^{+0.028}_{-0.025}$       | $H(2.33)$                   | $238.6^{+3.9}_{-3.2}$      |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{40}$                       | $1226^{+26}_{-26}$              | $D_{\text{M}}(2.33)$        | $5738^{+48}_{-76}$         |
| $A_{217}^{\text{CIB}}$                             | $41^{+10}_{-10}$                | $D_{220}$                      | $5720^{+79}_{-78}$              | $f\sigma_8(0.15)$           | $0.449^{+0.019}_{-0.021}$  |
| $A_{143}^{\text{tSZ}}$                             | $< 7.39$                        | $D_{810}$                      | $2538^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.723^{+0.036}_{-0.042}$  |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.66^{+0.24}_{-0.25}$          | $D_{1420}$                     | $814.7^{+9.9}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.464^{+0.020}_{-0.023}$  |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $D_{2000}$                     | $229.2^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | $0.640^{+0.033}_{-0.038}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $n_{\text{s}, 0.002}$          | $0.967^{+0.012}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.462^{+0.020}_{-0.023}$  |
| $A^{\text{kSZ}}$                                   | —                               | $Y_{\text{P}}$                 | $0.2470^{+0.0028}_{-0.0017}$    | $\sigma_8(0.51)$            | $0.598^{+0.031}_{-0.037}$  |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.37}$          | $Y_{\text{P}}^{\text{BBN}}$    | $0.2483^{+0.0028}_{-0.0017}$    | $f\sigma_8(0.61)$           | $0.456^{+0.020}_{-0.023}$  |
| $A_{143}^{\text{dust}}$                            | $0.97^{+0.33}_{-0.35}$          | $10^5 \text{D}/\text{H}$       | $2.632^{+0.081}_{-0.074}$       | $\sigma_8(0.61)$            | $0.569^{+0.030}_{-0.035}$  |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | $13.74^{+0.11}_{-0.18}$         | $f\sigma_8(2.33)$           | $0.287^{+0.016}_{-0.018}$  |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.31}$          | $z_*$                          | $1090.27^{+0.70}_{-0.65}$       | $\sigma_8(2.33)$            | $0.295^{+0.017}_{-0.019}$  |
| $c_{100}$  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                          | $143.4^{+1.6}_{-2.1}$           | $f_{2000}^{143}$            | $31^{+6}_{-6}$             |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | $1.04079^{+0.00071}_{-0.00076}$ | $f_{2000}^{217}$            | $107.9^{+4.2}_{-3.8}$      |
| $c_{TE}$   | $0.9972^{+0.010}_{-0.0097}$     | $D_{\text{M}}(z_*)/\text{Gpc}$ | $13.77^{+0.15}_{-0.19}$         | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$             |
| $c_{EE}$   | $0.993^{+0.010}_{-0.0099}$      | $z_{\text{drag}}$              | $1060.15^{+0.92}_{-0.84}$       | $\chi_{\text{lensing}}^2$   | $9.21 (\nu: 0.4)$          |
| $H_0$  | $67.2^{+1.7}_{-1.6}$            | $r_{\text{drag}}$              | $146.0^{+1.6}_{-2.1}$           | $\chi_{\text{small}}^2$     | $397.1 (\nu: 1.9)$         |
| $\Omega_{\Lambda}$                                 | $0.677^{+0.021}_{-0.023}$       | $k_{\text{D}}$                 | $0.1416^{+0.0017}_{-0.0014}$    | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 0.5)$          |
| $\Omega_{\text{m}}$                                | $0.323^{+0.023}_{-0.021}$       | $100\theta_{\text{D}}$         | $0.16106^{+0.00063}_{-0.00054}$ | $\chi_{\text{CamSpec}}^2$   | $11516.5 (\nu: 17.1)$      |
| $\Omega_{\text{m}} h^2$                            | $0.1457^{+0.0054}_{-0.0045}$    | $z_{\text{eq}}$                | $3350^{+87}_{-120}$             | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$           |
| $\Omega_{\nu} h^2$                                 | $0.0033^{+0.0049}_{-0.0028}$    | $k_{\text{eq}}$                | $0.01034^{+0.00028}_{-0.00034}$ | $\chi_{\text{CMB}}^2$       | $11946.0 (\nu: 18.3)$      |

$$\bar{\chi}_{\text{eff}}^2 = 11953.86; \Delta\bar{\chi}_{\text{eff}}^2 = 2.61; R - 1 = 0.02344$$



## 7.5 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter  | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                                     | 0.022350 | $0.02243^{+0.00032}_{-0.00030}$ | $\sigma_8$                  | 0.8062   | $0.788^{+0.039}_{-0.045}$       | $H(0.15)$                   | 73.00    | $73.4^{+1.7}_{-1.2}$      |
| $\Omega_c h^2$                                     | 0.1148   | $0.1187^{+0.0072}_{-0.0079}$    | $S_8$                       | 0.8184   | $0.801^{+0.041}_{-0.045}$       | $D_M(0.15)$                 | 640.1    | $637^{+12}_{-15}$         |
| $100\theta_{MC}$                                   | 1.04097  | $1.04082^{+0.00066}_{-0.00074}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4483   | $0.439^{+0.022}_{-0.025}$       | $H(0.38)$                   | 83.07    | $83.6^{+1.7}_{-1.1}$      |
| $\tau$   | 0.0538   | $0.055^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6012   | $0.588^{+0.028}_{-0.033}$       | $D_M(0.38)$                 | 1527.2   | $1519^{+25}_{-34}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | 0.380    | $< 0.703$                       | $\sigma_8/h^{0.5}$          | 0.9795   | $0.955^{+0.043}_{-0.051}$       | $H(0.51)$                   | 89.76    | $90.3^{+1.7}_{-1.0}$      |
| $N_{\text{eff}}$                                   | 3.047    | $< 3.40$                        | $r_{\text{drag}} h$         | 99.86    | $99.7^{+1.7}_{-1.7}$            | $D_M(0.51)$                 | 1978.7   | $1967^{+30}_{-42}$        |
| $\ln(10^{10} A_s)$                                 | 3.0404   | $3.044^{+0.035}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$ | 2.4251   | $2.415^{+0.050}_{-0.050}$       | $H(0.61)$                   | 95.36    | $96.0^{+1.7}_{-0.98}$     |
| $n_s$  | 0.9680   | $0.970^{+0.012}_{-0.011}$       | $z_{\text{re}}$             | 7.62     | $7.7^{+1.5}_{-1.6}$             | $D_M(0.61)$                 | 2302.8   | $2290^{+34}_{-48}$        |
| $y_{\text{cal}}$                                   | 1.00091  | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.091    | $2.098^{+0.073}_{-0.067}$       | $H(2.33)$                   | 235.81   | $237.5^{+3.7}_{-2.6}$     |
| $A_{100}^{\text{PS}}$                              | 234.6    | $243^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8778   | $1.881^{+0.028}_{-0.026}$       | $D_M(2.33)$                 | 5761     | $5725^{+54}_{-97}$        |
| $A_{143}^{\text{PS}}$                              | 43.8     | $41^{+20}_{-20}$                | $D_{40}$                    | 1222.9   | $1218^{+26}_{-26}$              | $f\sigma_8(0.15)$           | 0.4530   | $0.444^{+0.022}_{-0.025}$ |
| $A_{217}^{\text{PS}}$                              | 104.5    | $102^{+30}_{-30}$               | $D_{220}$                   | 5726     | $5723^{+77}_{-76}$              | $\sigma_8(0.15)$            | 0.7452   | $0.728^{+0.036}_{-0.042}$ |
| $A_{217}^{\text{CIB}}$                             | 41.8     | $41^{+10}_{-10}$                | $D_{810}$                   | 2538.5   | $2536^{+27}_{-26}$              | $f\sigma_8(0.38)$           | 0.4718   | $0.462^{+0.022}_{-0.026}$ |
| $A_{143}^{\text{tSZ}}$                             | 5.70     | $< 7.43$                        | $D_{1420}$                  | 817.4    | $815.2^{+9.5}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6609   | $0.646^{+0.032}_{-0.038}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | 0.693    | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | 230.94   | $229.5^{+3.4}_{-3.4}$           | $f\sigma_8(0.51)$           | 0.4707   | $0.461^{+0.022}_{-0.026}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | 0.71     | —                               | $n_{s,0.002}$               | 0.9680   | $0.970^{+0.012}_{-0.011}$       | $\sigma_8(0.51)$            | 0.6186   | $0.604^{+0.030}_{-0.035}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | 0.48     | —                               | $Y_P$                       | 0.24540  | $0.2469^{+0.0032}_{-0.0017}$    | $f\sigma_8(0.61)$           | 0.4659   | $0.456^{+0.022}_{-0.026}$ |
| $A^{\text{kSZ}}$                                   | 1.2      | —                               | $Y_P^{\text{BBN}}$          | 0.24673  | $0.2483^{+0.0032}_{-0.0017}$    | $\sigma_8(0.61)$            | 0.5886   | $0.575^{+0.029}_{-0.034}$ |
| $A_{100}^{\text{dust}}$                            | 1.010    | $1.02^{+0.38}_{-0.38}$          | $10^5 \text{D/H}$           | 2.590    | $2.615^{+0.080}_{-0.071}$       | $f\sigma_8(2.33)$           | 0.2969   | $0.290^{+0.015}_{-0.017}$ |
| $A_{143}^{\text{dust}}$                            | 0.958    | $0.97^{+0.34}_{-0.34}$          | Age/Gyr                     | 13.793   | $13.71^{+0.13}_{-0.23}$         | $\sigma_8(2.33)$            | 0.3062   | $0.299^{+0.016}_{-0.018}$ |
| $A_{217}^{\text{dust}}$                            | 0.975    | $0.97^{+0.20}_{-0.21}$          | $z_*$                       | 1089.85  | $1090.01^{+0.60}_{-0.57}$       | $f_{2000}^{143}$            | 29.4     | $31^{+6}_{-6}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | 1.030    | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | 144.74   | $143.7^{+1.4}_{-2.3}$           | $f_{2000}^{217}$            | 106.55   | $107.6^{+4.0}_{-3.9}$     |
| $c_{100}$  | 0.99777  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04116  | $1.04094^{+0.00073}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | 31.94    | $33^{+4}_{-4}$            |
| $c_{217}$  | 1.00120  | $1.0012^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.901   | $13.81^{+0.13}_{-0.21}$         | $\chi_{\text{simall}}^2$    | 395.95   | $397.1 (\nu: 1.7)$        |
| $c_{TE}$   | 0.9969   | $0.9975^{+0.0098}_{-0.0098}$    | $z_{\text{drag}}$           | 1059.82  | $1060.20^{+0.97}_{-0.86}$       | $\chi_{\text{lowl}}^2$      | 22.71    | $22.47 (\nu: 0.4)$        |
| $c_{EE}$   | 0.9925   | $0.994^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | 147.41   | $146.4^{+1.5}_{-2.4}$           | $\chi_{\text{CamSpec}}^2$   | 11500.3  | $11517.3 (\nu: 18.6)$     |
| $H_0$  | 67.75    | $68.1^{+1.7}_{-1.3}$            | $k_D$                       | 0.14051  | $0.1413^{+0.0018}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | 0.016    | $0.058 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | 0.6909   | $0.690^{+0.013}_{-0.013}$       | $100\theta_D$               | 0.16083  | $0.16104^{+0.00069}_{-0.00056}$ | $\chi_{\text{MGS}}^2$       | 1.34     | $1.30 (\nu: 0.1)$         |
| $\Omega_m$   | 0.3091   | $0.310^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | 3278     | $3321^{+91}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | 4.08     | $4.9 (\nu: 1.2)$          |
| $\Omega_m h^2$                                     | 0.14188  | $0.1439^{+0.0046}_{-0.0035}$    | $k_{\text{eq}}$             | 0.010078 | $0.01024^{+0.00032}_{-0.00040}$ | $\chi_{\text{prior}}^2$     | 2.1      | $7.9 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | 0.00469  | $0.0028^{+0.0055}_{-0.0022}$    | $100\theta_{\text{eq}}$     | 0.8388   | $0.830^{+0.030}_{-0.019}$       | $\chi_{\text{BAO}}^2$       | 5.44     | $6.2 (\nu: 0.8)$          |
| $\Omega_m h^3$                                     | 0.09612  | $0.0980^{+0.0048}_{-0.0025}$    | $100\theta_{s,\text{eq}}$   | 0.4628   | $0.458^{+0.016}_{-0.0097}$      | $\chi_{\text{CMB}}^2$       | 11919.0  | $11936.9 (\nu: 18.4)$     |

Best-fit  $\chi_{\text{eff}}^2 = 11926.47$ ;  $\bar{\chi}_{\text{eff}}^2 = 11950.99$ ;  $\Delta\chi_{\text{eff}}^2 = 2.71$ ;  $R - 1 = 0.01562$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.02 MGS: 1.34 DR12BAO: 4.08 CMB - simall\_100x143.offlike5\_EE\_Aplanck\_B: 395.95 commander\_dx12\_v3.2.29: 22.71 CamSpec like\_10.7HM\_1400\_unified: 11500.30



## 7.6 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02243^{+0.00032}_{-0.00030}$ | $S_8$                       | $0.801^{+0.040}_{-0.045}$       | $H(0.38)$                   | $83.6^{+1.7}_{-1.1}$      |
| $\Omega_c h^2$                                     | $0.1186^{+0.0073}_{-0.0079}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.022}_{-0.025}$       | $D_M(0.38)$                 | $1517^{+25}_{-34}$        |
| $100\theta_{MC}$                                   | $1.04083^{+0.00067}_{-0.00074}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.588^{+0.028}_{-0.033}$       | $H(0.51)$                   | $90.4^{+1.7}_{-1.0}$      |
| $\tau$   | $0.055^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.955^{+0.042}_{-0.051}$       | $D_M(0.51)$                 | $1966^{+30}_{-42}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.695$                       | $r_{\text{drag}} h$         | $99.8^{+1.7}_{-1.6}$            | $H(0.61)$                   | $96.0^{+1.8}_{-1.0}$      |
| $N_{\text{eff}}$                                   | $< 3.40$                        | $\langle d^2 \rangle^{1/2}$ | $2.413^{+0.049}_{-0.049}$       | $D_M(0.61)$                 | $2288^{+34}_{-48}$        |
| $\ln(10^{10} A_s)$                                 | $3.044^{+0.034}_{-0.032}$       | $z_{\text{re}}$             | $7.7^{+1.5}_{-1.6}$             | $H(2.33)$                   | $237.4^{+3.8}_{-2.6}$     |
| $n_s$  | $0.971^{+0.012}_{-0.011}$       | $10^9 A_s$                  | $2.099^{+0.073}_{-0.067}$       | $D_M(2.33)$                 | $5723^{+55}_{-100}$       |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.028}_{-0.026}$       | $f\sigma_8(0.15)$           | $0.443^{+0.022}_{-0.025}$ |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $D_{40}$                    | $1218^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.729^{+0.036}_{-0.042}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5724^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.462^{+0.022}_{-0.026}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.646^{+0.032}_{-0.037}$ |
| $A_{217}^{\text{CIB}}$                             | $41^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.5}_{-9.6}$           | $f\sigma_8(0.51)$           | $0.461^{+0.022}_{-0.026}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.42$                        | $D_{2000}$                  | $229.6^{+3.4}_{-3.5}$           | $\sigma_8(0.51)$            | $0.605^{+0.030}_{-0.035}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.971^{+0.012}_{-0.011}$       | $f\sigma_8(0.61)$           | $0.456^{+0.022}_{-0.026}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2470^{+0.0033}_{-0.0017}$    | $\sigma_8(0.61)$            | $0.576^{+0.029}_{-0.034}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2483^{+0.0033}_{-0.0017}$    | $f\sigma_8(2.33)$           | $0.291^{+0.015}_{-0.017}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 \text{D}/\text{H}$    | $2.615^{+0.080}_{-0.072}$       | $\sigma_8(2.33)$            | $0.300^{+0.015}_{-0.018}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.70^{+0.13}_{-0.24}$         | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1090.00^{+0.60}_{-0.57}$       | $f_{2000}^{217}$            | $107.6^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $143.7^{+1.4}_{-2.3}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04095^{+0.00074}_{-0.00082}$ | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.81^{+0.13}_{-0.22}$         | $\chi_{\text{lowl}}^2$      | $22.41 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.21^{+0.98}_{-0.86}$       | $\chi_{\text{CamSpec}}^2$   | $11517.4 (\nu: 18.5)$     |
| $c_{TE}$   | $0.9975^{+0.0099}_{-0.0099}$    | $r_{\text{drag}}$           | $146.4^{+1.5}_{-2.4}$           | $\chi_{\text{JLA}}^2$       | $1035.04 (\nu: 0.0)$      |
| $c_{EE}$   | $0.994^{+0.010}_{-0.010}$       | $k_{\text{D}}$              | $0.1413^{+0.0018}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | $0.048 (\nu: 0.0)$        |
| $H_0$  | $68.2^{+1.7}_{-1.3}$            | $100\theta_{\text{D}}$      | $0.16104^{+0.00070}_{-0.00057}$ | $\chi_{\text{MGS}}^2$       | $1.37 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                                 | $0.691^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3319^{+90}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.0)$          |
| $\Omega_{\text{m}}$                                | $0.309^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01024^{+0.00032}_{-0.00040}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1438^{+0.0047}_{-0.0035}$    | $100\theta_{\text{eq}}$     | $0.830^{+0.030}_{-0.018}$       | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.6)$          |
| $\Omega_{\nu} h^2$                                 | $0.0027^{+0.0064}_{-0.0022}$    | $100\theta_{\text{s,eq}}$   | $0.458^{+0.016}_{-0.0096}$      | $\chi_{\text{CMB}}^2$       | $11936.9 (\nu: 18.4)$     |
| $\Omega_{\text{m}} h^3$                            | $0.0981^{+0.0049}_{-0.0026}$    | $H(0.15)$                   | $73.5^{+1.7}_{-1.2}$            |                             |                           |
| $\sigma_8$   | $0.788^{+0.038}_{-0.045}$       | $D_M(0.15)$                 | $636^{+12}_{-15}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 12985.86; R - 1 = 0.01581$$



## 7.7 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Aver15

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02241^{+0.00031}_{-0.00030}$ | $S_8$                       | $0.799^{+0.040}_{-0.046}$       | $H(0.38)$                   | $83.4^{+1.2}_{-0.90}$     |
| $\Omega_c h^2$                                     | $0.1179^{+0.0063}_{-0.0074}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.022}_{-0.025}$       | $D_M(0.38)$                 | $1522^{+21}_{-26}$        |
| $100\theta_{MC}$                                   | $1.04087^{+0.00063}_{-0.00067}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.587^{+0.028}_{-0.033}$       | $H(0.51)$                   | $90.1^{+1.2}_{-0.82}$     |
| $\tau$   | $0.054^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.953^{+0.043}_{-0.052}$       | $D_M(0.51)$                 | $1972^{+26}_{-32}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.739$                       | $r_{\text{drag}} h$         | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.8^{+1.2}_{-0.77}$     |
| $N_{\text{eff}}$                                   | $< 3.30$                        | $\langle d^2 \rangle^{1/2}$ | $2.417^{+0.049}_{-0.049}$       | $D_M(0.61)$                 | $2295^{+28}_{-36}$        |
| $\ln(10^{10} A_s)$                                 | $3.042^{+0.033}_{-0.032}$       | $z_{\text{re}}$             | $7.7^{+1.5}_{-1.6}$             | $H(2.33)$                   | $237.0^{+2.9}_{-2.2}$     |
| $n_s$  | $0.969^{+0.010}_{-0.0096}$      | $10^9 A_s$                  | $2.095^{+0.071}_{-0.066}$       | $D_M(2.33)$                 | $5737^{+42}_{-71}$        |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.026}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.443^{+0.022}_{-0.025}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{40}$                    | $1220^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.726^{+0.034}_{-0.041}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5723^{+77}_{-77}$              | $f\sigma_8(0.38)$           | $0.461^{+0.022}_{-0.026}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.644^{+0.031}_{-0.037}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.6}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.459^{+0.022}_{-0.026}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.43$                        | $D_{2000}$                  | $229.7^{+3.3}_{-3.3}$           | $\sigma_8(0.51)$            | $0.603^{+0.029}_{-0.034}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.969^{+0.010}_{-0.0096}$      | $f\sigma_8(0.61)$           | $0.455^{+0.021}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2465^{+0.0023}_{-0.0012}$    | $\sigma_8(0.61)$            | $0.573^{+0.028}_{-0.033}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2478^{+0.0023}_{-0.0012}$    | $f\sigma_8(2.33)$           | $0.289^{+0.014}_{-0.017}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.608^{+0.068}_{-0.064}$       | $\sigma_8(2.33)$            | $0.298^{+0.015}_{-0.017}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.735^{+0.098}_{-0.17}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.96^{+0.54}_{-0.51}$       | $f_{2000}^{217}$            | $107.4^{+3.8}_{-3.8}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $144.0^{+1.1}_{-1.7}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04101^{+0.00064}_{-0.00074}$ | $\chi_{\text{small}}^2$     | $397.1 (\nu: 1.6)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.16}$         | $\chi_{\text{lowl}}^2$      | $22.60 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.09^{+0.83}_{-0.77}$       | $\chi_{\text{CamSpec}}^2$   | $11516.9 (\nu: 17.8)$     |
| $c_{TE}$   | $0.9973^{+0.0098}_{-0.0098}$    | $r_{\text{drag}}$           | $146.7^{+1.2}_{-1.8}$           | $\chi_{\text{Aver15}}^2$    | $0.61 (\nu: 0.1)$         |
| $c_{EE}$   | $0.9932^{+0.0097}_{-0.0098}$    | $k_{\text{D}}$              | $0.1411^{+0.0014}_{-0.0011}$    | $\chi_{6\text{DF}}^2$       | $0.058 (\nu: 0.0)$        |
| $H_0$  | $68.0^{+1.3}_{-1.2}$            | $100\theta_{\text{D}}$      | $0.16097^{+0.00056}_{-0.00049}$ | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                                 | $0.689^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3316^{+97}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_{\text{m}}$                                | $0.311^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01021^{+0.00030}_{-0.00039}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1434^{+0.0037}_{-0.0030}$    | $100\theta_{\text{eq}}$     | $0.831^{+0.031}_{-0.020}$       | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$          |
| $\Omega_{\nu} h^2$                                 | $0.0030^{+0.0062}_{-0.0025}$    | $100\theta_{\text{s,eq}}$   | $0.459^{+0.016}_{-0.010}$       | $\chi_{\text{CMB}}^2$       | $11936.5 (\nu: 17.9)$     |
| $\Omega_{\text{m}} h^3$                            | $0.0974^{+0.0035}_{-0.0019}$    | $H(0.15)$                   | $73.2^{+1.3}_{-1.1}$            |                             |                           |
| $\sigma_8$   | $0.786^{+0.037}_{-0.044}$       | $D_M(0.15)$                 | $638^{+10}_{-12}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11951.21; R - 1 = 0.01810$$



## 7.8 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02240^{+0.00031}_{-0.00029}$ | $S_8$                       | $0.799^{+0.040}_{-0.045}$       | $H(0.38)$                   | $83.4^{+1.2}_{-0.89}$     |
| $\Omega_c h^2$                                     | $0.1179^{+0.0061}_{-0.0072}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.022}_{-0.025}$       | $D_M(0.38)$                 | $1522^{+21}_{-25}$        |
| $100\theta_{MC}$                                   | $1.04087^{+0.00062}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.587^{+0.028}_{-0.033}$       | $H(0.51)$                   | $90.1^{+1.2}_{-0.81}$     |
| $\tau$   | $0.054^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.953^{+0.042}_{-0.052}$       | $D_M(0.51)$                 | $1972^{+25}_{-32}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.739$                       | $r_{\text{drag}} h$         | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.7^{+1.2}_{-0.76}$     |
| $N_{\text{eff}}$                                   | $< 3.29$                        | $\langle d^2 \rangle^{1/2}$ | $2.417^{+0.049}_{-0.049}$       | $D_M(0.61)$                 | $2295^{+28}_{-36}$        |
| $\ln(10^{10} A_s)$                                 | $3.042^{+0.033}_{-0.032}$       | $z_{\text{re}}$             | $7.7^{+1.5}_{-1.6}$             | $H(2.33)$                   | $237.0^{+2.8}_{-2.1}$     |
| $n_s$  | $0.969^{+0.011}_{-0.0092}$      | $10^9 A_s$                  | $2.095^{+0.071}_{-0.066}$       | $D_M(2.33)$                 | $5738^{+41}_{-70}$        |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.026}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.443^{+0.022}_{-0.025}$ |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $D_{40}$                    | $1220^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.726^{+0.034}_{-0.041}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5722^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.461^{+0.022}_{-0.026}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.644^{+0.031}_{-0.037}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.6}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.459^{+0.022}_{-0.025}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.43$                        | $D_{2000}$                  | $229.7^{+3.3}_{-3.3}$           | $\sigma_8(0.51)$            | $0.603^{+0.029}_{-0.035}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.969^{+0.011}_{-0.0092}$      | $f\sigma_8(0.61)$           | $0.455^{+0.021}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2465^{+0.0023}_{-0.0012}$    | $\sigma_8(0.61)$            | $0.573^{+0.027}_{-0.033}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2478^{+0.0023}_{-0.0012}$    | $f\sigma_8(2.33)$           | $0.289^{+0.014}_{-0.017}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.609^{+0.066}_{-0.058}$       | $\sigma_8(2.33)$            | $0.298^{+0.015}_{-0.018}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.737^{+0.096}_{-0.16}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.97^{+0.51}_{-0.48}$       | $f_{2000}^{217}$            | $107.5^{+3.8}_{-3.8}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $144.0^{+1.1}_{-1.7}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04102^{+0.00063}_{-0.00072}$ | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.16}$         | $\chi_{\text{lowl}}^2$      | $22.61 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.08^{+0.83}_{-0.76}$       | $\chi_{\text{CamSpec}}^2$   | $11516.8 (\nu: 17.6)$     |
| $c_{TE}$   | $0.9973^{+0.0099}_{-0.0098}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.7}$           | $\chi_{\text{Aver15}}^2$    | $0.60 (\nu: 0.1)$         |
| $c_{EE}$   | $0.9933^{+0.0096}_{-0.0097}$    | $k_{\text{D}}$              | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Cooke17}}^2$   | $0.12 (\nu: 0.0)$         |
| $H_0$  | $67.9^{+1.3}_{-1.2}$            | $100\theta_{\text{D}}$      | $0.16097^{+0.00053}_{-0.00046}$ | $\chi_{\text{6DF}}^2$       | $0.058 (\nu: 0.0)$        |
| $\Omega_{\Lambda}$                                 | $0.689^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3317^{+97}_{-140}$             | $\chi_{\text{MGS}}^2$       | $1.28 (\nu: 0.1)$         |
| $\Omega_{\text{m}}$                                | $0.311^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01021^{+0.00030}_{-0.00038}$ | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1434^{+0.0035}_{-0.0029}$    | $100\theta_{\text{eq}}$     | $0.831^{+0.031}_{-0.020}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_{\nu} h^2$                                 | $0.0030^{+0.0062}_{-0.0025}$    | $100\theta_{\text{s,eq}}$   | $0.459^{+0.016}_{-0.010}$       | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$          |
| $\Omega_{\text{m}} h^3$                            | $0.0974^{+0.0034}_{-0.0018}$    | $H(0.15)$                   | $73.2^{+1.3}_{-1.1}$            | $\chi_{\text{CMB}}^2$       | $11936.5 (\nu: 17.7)$     |
| $\sigma_8$   | $0.786^{+0.037}_{-0.044}$       | $D_M(0.15)$                 | $638^{+10}_{-12}$               | $\chi_{\text{Abund}}^2$     | $0.72 (\nu: 0.2)$         |

$$\bar{\chi}_{\text{eff}}^2 = 11951.25; R - 1 = 0.01822$$



## 7.9 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02243^{+0.00032}_{-0.00030}$ | $\sigma_8$                  | $0.789^{+0.038}_{-0.044}$       | $H(0.15)$                   | $73.4^{+1.7}_{-1.2}$      |
| $\Omega_c h^2$                                     | $0.1187^{+0.0071}_{-0.0079}$    | $S_8$                       | $0.802^{+0.040}_{-0.045}$       | $D_M(0.15)$                 | $637^{+12}_{-15}$         |
| $100\theta_{MC}$                                   | $1.04082^{+0.00066}_{-0.00074}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.439^{+0.022}_{-0.024}$       | $H(0.38)$                   | $83.6^{+1.7}_{-1.1}$      |
| $\tau$   | $0.056^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.589^{+0.028}_{-0.032}$       | $D_M(0.38)$                 | $1518^{+25}_{-34}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.695$                       | $\sigma_8/h^{0.5}$          | $0.956^{+0.042}_{-0.050}$       | $H(0.51)$                   | $90.3^{+1.7}_{-1.0}$      |
| $N_{\text{eff}}$                                   | $< 3.40$                        | $r_{\text{drag}} h$         | $99.7^{+1.7}_{-1.7}$            | $D_M(0.51)$                 | $1967^{+30}_{-42}$        |
| $\ln(10^{10} A_s)$                                 | $3.046^{+0.030}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$ | $2.417^{+0.048}_{-0.047}$       | $H(0.61)$                   | $96.0^{+1.7}_{-0.98}$     |
| $n_s$  | $0.971^{+0.012}_{-0.011}$       | $z_{\text{re}}$             | $< 9.02$                        | $D_M(0.61)$                 | $2289^{+34}_{-48}$        |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.103^{+0.065}_{-0.058}$       | $H(2.33)$                   | $237.5^{+3.7}_{-2.7}$     |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.028}_{-0.026}$       | $D_M(2.33)$                 | $5725^{+54}_{-97}$        |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{40}$                    | $1218^{+26}_{-26}$              | $f\sigma_8(0.15)$           | $0.444^{+0.022}_{-0.025}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{220}$                   | $5723^{+77}_{-76}$              | $\sigma_8(0.15)$            | $0.729^{+0.035}_{-0.041}$ |
| $A_{217}^{\text{CIB}}$                             | $41^{+10}_{-10}$                | $D_{810}$                   | $2536^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.462^{+0.022}_{-0.025}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.45$                        | $D_{1420}$                  | $815.2^{+9.4}_{-9.5}$           | $\sigma_8(0.38)$            | $0.646^{+0.032}_{-0.037}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | $229.6^{+3.3}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.461^{+0.022}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $n_{s,0.002}$               | $0.971^{+0.012}_{-0.011}$       | $\sigma_8(0.51)$            | $0.605^{+0.030}_{-0.035}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_P$                       | $0.2470^{+0.0032}_{-0.0017}$    | $f\sigma_8(0.61)$           | $0.456^{+0.022}_{-0.025}$ |
| $A^{\text{kSZ}}$                                   | —                               | $Y_P^{\text{BBN}}$          | $0.2483^{+0.0032}_{-0.0017}$    | $\sigma_8(0.61)$            | $0.576^{+0.029}_{-0.033}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $10^5 D/H$                  | $2.615^{+0.080}_{-0.071}$       | $f\sigma_8(2.33)$           | $0.291^{+0.015}_{-0.017}$ |
| $A_{143}^{\text{dust}}$                            | $0.97^{+0.34}_{-0.34}$          | $\text{Age}/\text{Gyr}$     | $13.71^{+0.13}_{-0.23}$         | $\sigma_8(2.33)$            | $0.300^{+0.015}_{-0.018}$ |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $z_*$                       | $1090.01^{+0.60}_{-0.57}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $143.7^{+1.4}_{-2.3}$           | $f_{2000}^{217}$            | $107.6^{+4.0}_{-3.9}$     |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04094^{+0.00073}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.81^{+0.13}_{-0.21}$         | $\chi_{\text{small}}^2$     | $397.0 (\nu: 1.7)$        |
| $c_{TE}$   | $0.9974^{+0.0099}_{-0.0098}$    | $z_{\text{drag}}$           | $1060.20^{+0.97}_{-0.87}$       | $\chi_{\text{lowl}}^2$      | $22.48 (\nu: 0.4)$        |
| $c_{EE}$   | $0.994^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $146.4^{+1.5}_{-2.4}$           | $\chi_{\text{CamSpec}}^2$   | $11517.2 (\nu: 18.1)$     |
| $H_0$  | $68.1^{+1.7}_{-1.3}$            | $k_D$                       | $0.1413^{+0.0018}_{-0.0013}$    | $\chi_{\text{6DF}}^2$       | $0.057 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | $0.690^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16104^{+0.00069}_{-0.00057}$ | $\chi_{\text{MGS}}^2$       | $1.31 (\nu: 0.1)$         |
| $\Omega_m$   | $0.310^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3321^{+90}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_m h^2$                                     | $0.1439^{+0.0046}_{-0.0036}$    | $k_{\text{eq}}$             | $0.01024^{+0.00032}_{-0.00040}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | $0.0028^{+0.0054}_{-0.0026}$    | $100\theta_{\text{eq}}$     | $0.830^{+0.030}_{-0.019}$       | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$          |
| $\Omega_m h^3$                                     | $0.0981^{+0.0048}_{-0.0025}$    | $100\theta_{s,\text{eq}}$   | $0.458^{+0.016}_{-0.0096}$      | $\chi_{\text{CMB}}^2$       | $11936.7 (\nu: 17.9)$     |

$$\bar{\chi}_{\text{eff}}^2 = 11950.77; \Delta\bar{\chi}_{\text{eff}}^2 = 2.78; R - 1 = 0.01713$$



## 7.10 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02244^{+0.00032}_{-0.00030}$ | $S_8$                       | $0.801^{+0.040}_{-0.045}$       | $H(0.38)$                   | $83.6^{+1.7}_{-1.1}$      |
| $\Omega_c h^2$                                     | $0.1187^{+0.0072}_{-0.0079}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.439^{+0.022}_{-0.024}$       | $D_M(0.38)$                 | $1517^{+25}_{-34}$        |
| $100\theta_{MC}$                                   | $1.04083^{+0.00066}_{-0.00074}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.589^{+0.028}_{-0.032}$       | $H(0.51)$                   | $90.4^{+1.7}_{-1.0}$      |
| $\tau$   | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.956^{+0.041}_{-0.050}$       | $D_M(0.51)$                 | $1965^{+30}_{-43}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.689$                       | $r_{\text{drag}} h$         | $99.8^{+1.7}_{-1.6}$            | $H(0.61)$                   | $96.0^{+1.8}_{-1.0}$      |
| $N_{\text{eff}}$                                   | $< 3.41$                        | $\langle d^2 \rangle^{1/2}$ | $2.415^{+0.048}_{-0.046}$       | $D_M(0.61)$                 | $2287^{+33}_{-49}$        |
| $\ln(10^{10} A_s)$                                 | $3.046^{+0.030}_{-0.028}$       | $z_{\text{re}}$             | $< 9.03$                        | $H(2.33)$                   | $237.4^{+3.8}_{-2.7}$     |
| $n_s$  | $0.971^{+0.012}_{-0.011}$       | $10^9 A_s$                  | $2.103^{+0.064}_{-0.058}$       | $D_M(2.33)$                 | $5723^{+55}_{-100}$       |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.028}_{-0.026}$       | $f\sigma_8(0.15)$           | $0.444^{+0.022}_{-0.025}$ |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $D_{40}$                    | $1218^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.730^{+0.035}_{-0.041}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5724^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.462^{+0.022}_{-0.025}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2536^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.647^{+0.032}_{-0.037}$ |
| $A_{217}^{\text{CIB}}$                             | $41^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.5}_{-9.6}$           | $f\sigma_8(0.51)$           | $0.461^{+0.022}_{-0.025}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.44$                        | $D_{2000}$                  | $229.6^{+3.3}_{-3.5}$           | $\sigma_8(0.51)$            | $0.606^{+0.030}_{-0.034}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | $0.971^{+0.012}_{-0.011}$       | $f\sigma_8(0.61)$           | $0.456^{+0.021}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P$                       | $0.2470^{+0.0039}_{-0.0017}$    | $\sigma_8(0.61)$            | $0.576^{+0.028}_{-0.033}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_P^{\text{BBN}}$          | $0.2483^{+0.0039}_{-0.0017}$    | $f\sigma_8(2.33)$           | $0.291^{+0.014}_{-0.017}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.614^{+0.081}_{-0.072}$       | $\sigma_8(2.33)$            | $0.300^{+0.015}_{-0.017}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.70^{+0.13}_{-0.24}$         | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.99^{+0.60}_{-0.57}$       | $f_{2000}^{217}$            | $107.6^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $143.7^{+1.4}_{-2.4}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04095^{+0.00074}_{-0.00083}$ | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.7)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.81^{+0.13}_{-0.22}$         | $\chi_{\text{lowl}}^2$      | $22.42 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.21^{+0.98}_{-0.86}$       | $\chi_{\text{CamSpec}}^2$   | $11517.3 (\nu: 18.1)$     |
| $c_{TE}$   | $0.9974^{+0.0099}_{-0.0099}$    | $r_{\text{drag}}$           | $146.4^{+1.5}_{-2.5}$           | $\chi_{\text{JLA}}^2$       | $1035.04 (\nu: 0.0)$      |
| $c_{EE}$   | $0.994^{+0.010}_{-0.010}$       | $k_D$                       | $0.1413^{+0.0018}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$        |
| $H_0$  | $68.2^{+1.7}_{-1.3}$            | $100\theta_D$               | $0.16104^{+0.00070}_{-0.00058}$ | $\chi_{\text{MGS}}^2$       | $1.37 (\nu: 0.1)$         |
| $\Omega_\Lambda$                                   | $0.691^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3319^{+89}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 0.9)$          |
| $\Omega_m$   | $0.309^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01024^{+0.00032}_{-0.00040}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_m h^2$                                     | $0.1438^{+0.0047}_{-0.0035}$    | $100\theta_{\text{eq}}$     | $0.830^{+0.030}_{-0.018}$       | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.6)$          |
| $\Omega_\nu h^2$                                   | $0.0027^{+0.0054}_{-0.0025}$    | $100\theta_{s,\text{eq}}$   | $0.458^{+0.016}_{-0.0095}$      | $\chi_{\text{CMB}}^2$       | $11936.7 (\nu: 17.9)$     |
| $\Omega_m h^3$                                     | $0.0981^{+0.0054}_{-0.0026}$    | $H(0.15)$                   | $73.5^{+1.7}_{-1.2}$            |                             |                           |
| $\sigma_8$   | $0.789^{+0.038}_{-0.044}$       | $D_M(0.15)$                 | $636^{+11}_{-15}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 12985.64; R - 1 = 0.01787$$



7.11 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Aver15\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02241^{+0.00031}_{-0.00029}$ | $S_8$                       | $0.800^{+0.040}_{-0.045}$       | $H(0.38)$                   | $83.4^{+1.2}_{-0.90}$     |
| $\Omega_c h^2$                                     | $0.1179^{+0.0062}_{-0.0074}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.022}_{-0.025}$       | $D_M(0.38)$                 | $1522^{+21}_{-26}$        |
| $100\theta_{MC}$                                   | $1.04087^{+0.00063}_{-0.00067}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.587^{+0.028}_{-0.032}$       | $H(0.51)$                   | $90.1^{+1.2}_{-0.82}$     |
| $\tau$   | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.954^{+0.042}_{-0.050}$       | $D_M(0.51)$                 | $1972^{+26}_{-32}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.738$                       | $r_{\text{drag}} h$         | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.8^{+1.3}_{-0.77}$     |
| $N_{\text{eff}}$                                   | $< 3.30$                        | $\langle d^2 \rangle^{1/2}$ | $2.419^{+0.047}_{-0.045}$       | $D_M(0.61)$                 | $2294^{+28}_{-36}$        |
| $\ln(10^{10} A_s)$                                 | $3.044^{+0.029}_{-0.027}$       | $z_{\text{re}}$             | $< 9.00$                        | $H(2.33)$                   | $237.0^{+2.9}_{-2.2}$     |
| $n_s$  | $0.969^{+0.010}_{-0.0096}$      | $10^9 A_s$                  | $2.100^{+0.062}_{-0.056}$       | $D_M(2.33)$                 | $5737^{+42}_{-72}$        |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.025}_{-0.024}$       | $f\sigma_8(0.15)$           | $0.443^{+0.022}_{-0.025}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{40}$                    | $1220^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.727^{+0.034}_{-0.040}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5722^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.461^{+0.022}_{-0.025}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.645^{+0.030}_{-0.036}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.5}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.460^{+0.021}_{-0.025}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.46$                        | $D_{2000}$                  | $229.7^{+3.3}_{-3.3}$           | $\sigma_8(0.51)$            | $0.603^{+0.028}_{-0.034}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.969^{+0.010}_{-0.0096}$      | $f\sigma_8(0.61)$           | $0.455^{+0.021}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2465^{+0.0023}_{-0.0012}$    | $\sigma_8(0.61)$            | $0.574^{+0.027}_{-0.032}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2479^{+0.0023}_{-0.0012}$    | $f\sigma_8(2.33)$           | $0.290^{+0.014}_{-0.016}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.608^{+0.067}_{-0.064}$       | $\sigma_8(2.33)$            | $0.299^{+0.014}_{-0.017}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.734^{+0.098}_{-0.17}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.96^{+0.54}_{-0.51}$       | $f_{2000}^{217}$            | $107.4^{+3.8}_{-3.8}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $144.0^{+1.1}_{-1.7}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04101^{+0.00064}_{-0.00074}$ | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.7)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.16}$         | $\chi_{\text{lowl}}^2$      | $22.61 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.10^{+0.82}_{-0.77}$       | $\chi_{\text{CamSpec}}^2$   | $11516.7 (\nu: 17.4)$     |
| $c_{TE}$   | $0.9972^{+0.0099}_{-0.0098}$    | $r_{\text{drag}}$           | $146.7^{+1.2}_{-1.8}$           | $\chi_{\text{Aver15}}^2$    | $0.62 (\nu: 0.1)$         |
| $c_{EE}$   | $0.9932^{+0.0097}_{-0.0098}$    | $k_{\text{D}}$              | $0.1411^{+0.0014}_{-0.0011}$    | $\chi_{6\text{DF}}^2$       | $0.057 (\nu: 0.0)$        |
| $H_0$  | $68.0^{+1.3}_{-1.2}$            | $100\theta_{\text{D}}$      | $0.16097^{+0.00056}_{-0.00049}$ | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                                 | $0.690^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3316^{+96}_{-140}$             | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_{\text{m}}$                                | $0.310^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01021^{+0.00030}_{-0.00039}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1434^{+0.0037}_{-0.0030}$    | $100\theta_{\text{eq}}$     | $0.831^{+0.031}_{-0.020}$       | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$          |
| $\Omega_{\nu} h^2$                                 | $0.0030^{+0.0062}_{-0.0025}$    | $100\theta_{\text{s,eq}}$   | $0.459^{+0.016}_{-0.010}$       | $\chi_{\text{CMB}}^2$       | $11936.3 (\nu: 17.4)$     |
| $\Omega_{\text{m}} h^3$                            | $0.0974^{+0.0035}_{-0.0019}$    | $H(0.15)$                   | $73.3^{+1.3}_{-1.1}$            |                             |                           |
| $\sigma_8$   | $0.787^{+0.036}_{-0.043}$       | $D_M(0.15)$                 | $638^{+10}_{-12}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11950.98; R - 1 = 0.01936$$



## 7.12 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02240^{+0.00030}_{-0.00029}$ | $S_8$                       | $0.800^{+0.040}_{-0.045}$       | $H(0.38)$                   | $83.4^{+1.2}_{-0.88}$     |
| $\Omega_c h^2$                                     | $0.1179^{+0.0061}_{-0.0072}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.438^{+0.022}_{-0.024}$       | $D_M(0.38)$                 | $1522^{+21}_{-26}$        |
| $100\theta_{MC}$                                   | $1.04087^{+0.00062}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.587^{+0.027}_{-0.032}$       | $H(0.51)$                   | $90.1^{+1.2}_{-0.80}$     |
| $\tau$   | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.954^{+0.042}_{-0.050}$       | $D_M(0.51)$                 | $1972^{+25}_{-32}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.737$                       | $r_{\text{drag}} h$         | $99.7^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.8^{+1.2}_{-0.75}$     |
| $N_{\text{eff}}$                                   | $< 3.29$                        | $\langle d^2 \rangle^{1/2}$ | $2.419^{+0.047}_{-0.045}$       | $D_M(0.61)$                 | $2295^{+28}_{-36}$        |
| $\ln(10^{10} A_s)$                                 | $3.044^{+0.029}_{-0.027}$       | $z_{\text{re}}$             | $< 9.00$                        | $H(2.33)$                   | $237.0^{+2.8}_{-2.1}$     |
| $n_s$  | $0.969^{+0.011}_{-0.0092}$      | $10^9 A_s$                  | $2.100^{+0.062}_{-0.056}$       | $D_M(2.33)$                 | $5737^{+41}_{-70}$        |
| $y_{\text{cal}}$                                   | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.026}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.443^{+0.022}_{-0.024}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{40}$                    | $1220^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.727^{+0.034}_{-0.040}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5722^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.461^{+0.022}_{-0.025}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.645^{+0.030}_{-0.036}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.3^{+9.5}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.460^{+0.021}_{-0.025}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.45$                        | $D_{2000}$                  | $229.7^{+3.3}_{-3.2}$           | $\sigma_8(0.51)$            | $0.603^{+0.028}_{-0.034}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.969^{+0.011}_{-0.0092}$      | $f\sigma_8(0.61)$           | $0.455^{+0.021}_{-0.025}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2465^{+0.0023}_{-0.0012}$    | $\sigma_8(0.61)$            | $0.574^{+0.027}_{-0.032}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2478^{+0.0023}_{-0.0012}$    | $f\sigma_8(2.33)$           | $0.290^{+0.014}_{-0.016}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 \text{D}/\text{H}$    | $2.608^{+0.066}_{-0.058}$       | $\sigma_8(2.33)$            | $0.299^{+0.014}_{-0.017}$ |
| $A_{100}^{\text{dust}}$                            | $1.02^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.736^{+0.096}_{-0.17}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.96^{+0.51}_{-0.48}$       | $f_{2000}^{217}$            | $107.4^{+3.8}_{-3.8}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $144.0^{+1.1}_{-1.7}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.04101^{+0.00063}_{-0.00072}$ | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.7)$        |
| $c_{100}$  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.16}$         | $\chi_{\text{lowl}}^2$      | $22.62 (\nu: 0.4)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.08^{+0.82}_{-0.76}$       | $\chi_{\text{CamSpec}}^2$   | $11516.6 (\nu: 17.3)$     |
| $c_{TE}$   | $0.9972^{+0.0099}_{-0.0098}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.7}$           | $\chi_{\text{Aver15}}^2$    | $0.61 (\nu: 0.1)$         |
| $c_{EE}$   | $0.9932^{+0.0096}_{-0.0097}$    | $k_{\text{D}}$              | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Cooke17}}^2$   | $0.12 (\nu: 0.0)$         |
| $H_0$  | $67.9^{+1.3}_{-1.2}$            | $100\theta_{\text{D}}$      | $0.16097^{+0.00053}_{-0.00047}$ | $\chi_{\text{6DF}}^2$       | $0.057 (\nu: 0.0)$        |
| $\Omega_{\Lambda}$                                 | $0.689^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3317^{+95}_{-140}$             | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$         |
| $\Omega_{\text{m}}$                                | $0.311^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01021^{+0.00030}_{-0.00038}$ | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1434^{+0.0036}_{-0.0029}$    | $100\theta_{\text{eq}}$     | $0.831^{+0.031}_{-0.020}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_{\nu} h^2$                                 | $0.0030^{+0.0062}_{-0.0025}$    | $100\theta_{\text{s,eq}}$   | $0.459^{+0.016}_{-0.010}$       | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$          |
| $\Omega_{\text{m}} h^3$                            | $0.0974^{+0.0034}_{-0.0019}$    | $H(0.15)$                   | $73.2^{+1.3}_{-1.1}$            | $\chi_{\text{CMB}}^2$       | $11936.2 (\nu: 17.3)$     |
| $\sigma_8$   | $0.787^{+0.036}_{-0.043}$       | $D_M(0.15)$                 | $638^{+10}_{-12}$               | $\chi_{\text{Abund}}^2$     | $0.73 (\nu: 0.2)$         |

$$\bar{\chi}_{\text{eff}}^2 = 11951.02; R - 1 = 0.01932$$



### 7.13 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO

| Parameter  | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                                     | 0.022343 | $0.02241^{+0.00031}_{-0.00029}$ | $S_8$                       | 0.8223   | $0.809^{+0.032}_{-0.036}$       | $H(0.38)$                   | 83.00    | $83.4^{+1.5}_{-1.0}$      |
| $\Omega_c h^2$                                     | 0.1191   | $0.1192^{+0.0064}_{-0.0066}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4504   | $0.443^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | 1529.1   | $1522^{+23}_{-30}$        |
| $100\theta_{MC}$                                   | 1.04094  | $1.04081^{+0.00064}_{-0.00070}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6032   | $0.593^{+0.023}_{-0.026}$       | $H(0.51)$                   | 89.71    | $90.2^{+1.5}_{-0.95}$     |
| $\tau$   | 0.0546   | $0.056^{+0.016}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9824   | $0.963^{+0.033}_{-0.041}$       | $D_M(0.51)$                 | 1980.9   | $1971^{+29}_{-38}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | 0.011    | $< 0.561$                       | $r_{\text{drag}} h$         | 99.64    | $99.5^{+1.6}_{-1.6}$            | $H(0.61)$                   | 95.33    | $95.9^{+1.5}_{-0.91}$     |
| $N_{\text{eff}}$                                   | 3.046    | $< 3.36$                        | $\langle d^2 \rangle^{1/2}$ | 2.4294   | $2.427^{+0.040}_{-0.041}$       | $D_M(0.61)$                 | 2305.2   | $2294^{+32}_{-43}$        |
| $\ln(10^{10} A_s)$                                 | 3.0410   | $3.048^{+0.032}_{-0.029}$       | $z_{\text{re}}$             | 7.70     | $7.9^{+1.5}_{-1.4}$             | $H(2.33)$                   | 235.99   | $237.5^{+3.5}_{-2.5}$     |
| $n_s$  | 0.9673   | $0.969^{+0.011}_{-0.010}$       | $10^9 A_s$                  | 2.093    | $2.109^{+0.068}_{-0.061}$       | $D_M(2.33)$                 | 5763     | $5731^{+50}_{-87}$        |
| $y_{\text{cal}}$                                   | 1.00024  | $1.0008^{+0.0049}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | 1.8762   | $1.883^{+0.027}_{-0.024}$       | $f\sigma_8(0.15)$           | 0.4550   | $0.448^{+0.018}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | 235.8    | $243^{+50}_{-50}$               | $D_{40}$                    | 1223.1   | $1222^{+24}_{-26}$              | $\sigma_8(0.15)$            | 0.7466   | $0.733^{+0.030}_{-0.035}$ |
| $A_{143}^{\text{PS}}$                              | 47.5     | $41^{+20}_{-20}$                | $D_{220}$                   | 5717     | $5726^{+75}_{-78}$              | $f\sigma_8(0.38)$           | 0.4735   | $0.466^{+0.018}_{-0.021}$ |
| $A_{217}^{\text{PS}}$                              | 103.5    | $102^{+30}_{-30}$               | $D_{810}$                   | 2535.0   | $2538^{+26}_{-27}$              | $\sigma_8(0.38)$            | 0.6619   | $0.650^{+0.027}_{-0.031}$ |
| $A_{217}^{\text{CIB}}$                             | 39.8     | $40^{+10}_{-10}$                | $D_{1420}$                  | 816.1    | $815.6^{+9.4}_{-9.2}$           | $f\sigma_8(0.51)$           | 0.4722   | $0.465^{+0.018}_{-0.021}$ |
| $A_{143}^{\text{tSZ}}$                             | 4.40     | $< 7.34$                        | $D_{2000}$                  | 230.54   | $229.8^{+3.2}_{-3.4}$           | $\sigma_8(0.51)$            | 0.6194   | $0.608^{+0.026}_{-0.030}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | 0.725    | $0.65^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | 0.9673   | $0.969^{+0.011}_{-0.010}$       | $f\sigma_8(0.61)$           | 0.4672   | $0.460^{+0.018}_{-0.021}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | 0.73     | —                               | $Y_P$                       | 0.24539  | $0.2467^{+0.0029}_{-0.0015}$    | $\sigma_8(0.61)$            | 0.5894   | $0.579^{+0.024}_{-0.028}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | 0.94     | —                               | $Y_P^{\text{BBN}}$          | 0.24671  | $0.2481^{+0.0029}_{-0.0015}$    | $f\sigma_8(2.33)$           | 0.2972   | $0.292^{+0.013}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | 3.4      | —                               | $10^5 D/H$                  | 2.591    | $2.615^{+0.076}_{-0.068}$       | $\sigma_8(2.33)$            | 0.3064   | $0.301^{+0.013}_{-0.015}$ |
| $A_{100}^{\text{dust}}$                            | 1.022    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.796   | $13.72^{+0.12}_{-0.21}$         | $f_{2000}^{143}$            | 29.7     | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | 0.975    | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | 1089.88  | $1090.04^{+0.58}_{-0.54}$       | $f_{2000}^{217}$            | 106.44   | $107.5^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | 0.982    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.66   | $143.8^{+1.3}_{-2.1}$           | $f_{2000}^{143 \times 217}$ | 31.97    | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | 1.019    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04113  | $1.04094^{+0.00071}_{-0.00076}$ | $\chi_{\text{lensing}}^2$   | 8.94     | $9.5 (\nu: 0.5)$          |
| $c_{100}$  | 0.99765  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.895   | $13.81^{+0.12}_{-0.19}$         | $\chi_{\text{small}}^2$     | 396.07   | $397.3 (\nu: 2.1)$        |
| $c_{217}$  | 1.00128  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.82  | $1060.15^{+0.95}_{-0.85}$       | $\chi_{\text{lowl}}^2$      | 22.86    | $22.72 (\nu: 0.4)$        |
| $c_{TE}$   | 0.9964   | $0.9971^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | 147.34   | $146.4^{+1.4}_{-2.1}$           | $\chi_{\text{CamSpec}}^2$   | 11500.0  | $11516.1 (\nu: 16.9)$     |
| $c_{EE}$   | 0.9920   | $0.9934^{+0.0099}_{-0.0099}$    | $k_D$                       | 0.14058  | $0.1413^{+0.0016}_{-0.0012}$    | $\chi_{6\text{DF}}^2$       | 0.030    | $0.073 (\nu: 0.0)$        |
| $H_0$  | 67.63    | $67.9^{+1.5}_{-1.3}$            | $100\theta_D$               | 0.16083  | $0.16102^{+0.00066}_{-0.00054}$ | $\chi_{\text{MGS}}^2$       | 1.22     | $1.18 (\nu: 0.1)$         |
| $\Omega_\Lambda$                                   | 0.6892   | $0.688^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | 3379     | $3338^{+80}_{-110}$             | $\chi_{\text{DR12BAO}}^2$   | 4.42     | $5.2 (\nu: 1.5)$          |
| $\Omega_m$   | 0.3108   | $0.312^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | 0.010315 | $0.01028^{+0.00028}_{-0.00032}$ | $\chi_{\text{prior}}^2$     | 2.1      | $7.8 (\nu: 5.9)$          |
| $\Omega_m h^2$                                     | 0.14216  | $0.1440^{+0.0043}_{-0.0033}$    | $100\theta_{\text{eq}}$     | 0.8175   | $0.826^{+0.023}_{-0.016}$       | $\chi_{\text{CMB}}^2$       | 11927.8  | $11945.6 (\nu: 18.3)$     |
| $\Omega_\nu h^2$                                   | 0.00077  | $0.0024^{+0.0044}_{-0.0021}$    | $100\theta_{s,\text{eq}}$   | 0.4516   | $0.456^{+0.012}_{-0.0084}$      | $\chi_{\text{BAO}}^2$       | 5.67     | $6.5 (\nu: 1.1)$          |
| $\Omega_m h^3$                                     | 0.09614  | $0.0978^{+0.0043}_{-0.0023}$    | $H(0.15)$                   | 72.90    | $73.3^{+1.5}_{-1.2}$            |                             |          |                           |
| $\sigma_8$   | 0.8079   | $0.794^{+0.032}_{-0.037}$       | $D_M(0.15)$                 | 641.1    | $638^{+11}_{-14}$               |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 11935.63$ ;  $\bar{\chi}_{\text{eff}}^2 = 11959.89$ ;  $\Delta\chi_{\text{eff}}^2 = 2.49$ ;  $R - 1 = 0.03604$

$\chi_{\text{eff}}^2$ : BAO - 6DF: 0.03 MGS: 1.22 DR12BAO: 4.42 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.94 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.07 commander\_dx12\_v3.2.29: 22.86 CamSpec like\_10.7HM\_1400\_unified: 11499.95



# 7.14 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18

| Parameter  | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                                     | 0.022368 | $0.02241^{+0.00032}_{-0.00029}$ | $S_8$                       | 0.8213   | $0.809^{+0.032}_{-0.035}$       | $H(0.38)$                   | 83.34    | $83.5^{+1.5}_{-1.0}$      |
| $\Omega_c h^2$                                     | 0.1197   | $0.1192^{+0.0066}_{-0.0065}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4499   | $0.443^{+0.018}_{-0.019}$       | $D_M(0.38)$                 | 1522.2   | $1520^{+24}_{-31}$        |
| $100\theta_{MC}$                                   | 1.04086  | $1.04082^{+0.00064}_{-0.00071}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6034   | $0.593^{+0.023}_{-0.026}$       | $H(0.51)$                   | 90.05    | $90.3^{+1.6}_{-0.97}$     |
| $\tau$   | 0.0548   | $0.057^{+0.016}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9816   | $0.964^{+0.033}_{-0.040}$       | $D_M(0.51)$                 | 1972.3   | $1969^{+29}_{-39}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | 0.000    | $< 0.532$                       | $r_{\text{drag}} h$         | 99.87    | $99.6^{+1.6}_{-1.6}$            | $H(0.61)$                   | 95.67    | $95.9^{+1.6}_{-0.94}$     |
| $N_{\text{eff}}$                                   | 3.093    | $< 3.37$                        | $\langle d^2 \rangle^{1/2}$ | 2.4283   | $2.426^{+0.041}_{-0.041}$       | $D_M(0.61)$                 | 2295.3   | $2292^{+32}_{-44}$        |
| $\ln(10^{10} A_s)$                                 | 3.0433   | $3.049^{+0.032}_{-0.029}$       | $z_{\text{re}}$             | 7.73     | $7.9^{+1.5}_{-1.4}$             | $H(2.33)$                   | 236.54   | $237.4^{+3.6}_{-2.5}$     |
| $n_s$  | 0.9679   | $0.970^{+0.011}_{-0.010}$       | $10^9 A_s$                  | 2.097    | $2.110^{+0.068}_{-0.061}$       | $D_M(2.33)$                 | 5743     | $5729^{+52}_{-90}$        |
| $y_{\text{cal}}$                                   | 1.00049  | $1.0008^{+0.0049}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | 1.8796   | $1.883^{+0.028}_{-0.024}$       | $f\sigma_8(0.15)$           | 0.4547   | $0.448^{+0.017}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | 240.3    | $243^{+50}_{-50}$               | $D_{40}$                    | 1224.1   | $1221^{+24}_{-26}$              | $\sigma_8(0.15)$            | 0.7481   | $0.734^{+0.030}_{-0.034}$ |
| $A_{143}^{\text{PS}}$                              | 40.6     | $41^{+20}_{-20}$                | $D_{220}$                   | 5725     | $5727^{+76}_{-78}$              | $f\sigma_8(0.38)$           | 0.4735   | $0.466^{+0.018}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | 100.4    | $102^{+30}_{-30}$               | $D_{810}$                   | 2535.3   | $2538^{+26}_{-26}$              | $\sigma_8(0.38)$            | 0.6634   | $0.651^{+0.027}_{-0.031}$ |
| $A_{217}^{\text{CIB}}$                             | 44.6     | $40^{+10}_{-10}$                | $D_{1420}$                  | 815.2    | $815.7^{+9.4}_{-9.2}$           | $f\sigma_8(0.51)$           | 0.4724   | $0.465^{+0.018}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | 5.93     | $< 7.29$                        | $D_{2000}$                  | 229.98   | $229.8^{+3.2}_{-3.4}$           | $\sigma_8(0.51)$            | 0.6209   | $0.609^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | 0.577    | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9679   | $0.970^{+0.011}_{-0.010}$       | $f\sigma_8(0.61)$           | 0.4677   | $0.460^{+0.018}_{-0.020}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | 0.78     | —                               | $Y_P$                       | 0.24602  | $0.2468^{+0.0030}_{-0.0015}$    | $\sigma_8(0.61)$            | 0.5909   | $0.580^{+0.024}_{-0.028}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | 0.11     | —                               | $Y_P^{\text{BBN}}$          | 0.24735  | $0.2481^{+0.0030}_{-0.0015}$    | $f\sigma_8(2.33)$           | 0.2980   | $0.293^{+0.012}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | 1.1      | —                               | $10^5 D/H$                  | 2.602    | $2.614^{+0.078}_{-0.068}$       | $\sigma_8(2.33)$            | 0.3074   | $0.302^{+0.013}_{-0.015}$ |
| $A_{100}^{\text{dust}}$                            | 1.005    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.750   | $13.71^{+0.12}_{-0.21}$         | $f_{2000}^{143}$            | 30.9     | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | 0.980    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.95  | $1090.02^{+0.58}_{-0.54}$       | $f_{2000}^{217}$            | 107.29   | $107.5^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | 0.974    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.27   | $143.8^{+1.3}_{-2.2}$           | $f_{2000}^{143 \times 217}$ | 32.61    | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | 1.006    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04102  | $1.04094^{+0.00072}_{-0.00077}$ | $\chi_{\text{lensing}}^2$   | 9.02     | $9.5 (\nu: 0.5)$          |
| $c_{100}$  | 0.99761  | $0.9976^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.858   | $13.81^{+0.13}_{-0.20}$         | $\chi_{\text{small}}^2$     | 396.12   | $397.4 (\nu: 2.2)$        |
| $c_{217}$  | 1.00143  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.93  | $1060.16^{+0.97}_{-0.86}$       | $\chi_{\text{lowl}}^2$      | 22.86    | $22.66 (\nu: 0.4)$        |
| $c_{TE}$   | 0.9965   | $0.9972^{+0.0097}_{-0.0098}$    | $r_{\text{drag}}$           | 146.93   | $146.4^{+1.4}_{-2.2}$           | $\chi_{\text{CamSpec}}^2$   | 11500.0  | $11516.2 (\nu: 17.0)$     |
| $c_{EE}$   | 0.9929   | $0.9934^{+0.0099}_{-0.0099}$    | $k_D$                       | 0.14086  | $0.1413^{+0.0017}_{-0.0013}$    | $\chi_{\text{JLA}}^2$       | 1034.94  | $1035.11 (\nu: 0.1)$      |
| $H_0$  | 67.97    | $68.0^{+1.6}_{-1.3}$            | $100\theta_D$               | 0.16094  | $0.16102^{+0.00067}_{-0.00054}$ | $\chi_{6\text{DF}}^2$       | 0.016    | $0.060 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | 0.6910   | $0.689^{+0.012}_{-0.013}$       | $z_{\text{eq}}$             | 3375     | $3337^{+77}_{-110}$             | $\chi_{\text{MGS}}^2$       | 1.34     | $1.25 (\nu: 0.1)$         |
| $\Omega_m$   | 0.3090   | $0.311^{+0.013}_{-0.012}$       | $k_{\text{eq}}$             | 0.010332 | $0.01028^{+0.00028}_{-0.00032}$ | $\chi_{\text{DR12BAO}}^2$   | 4.09     | $5.0 (\nu: 1.2)$          |
| $\Omega_m h^2$                                     | 0.14275  | $0.1439^{+0.0044}_{-0.0033}$    | $100\theta_{\text{eq}}$     | 0.8182   | $0.826^{+0.022}_{-0.016}$       | $\chi_{\text{prior}}^2$     | 2.3      | $7.8 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | 0.00065  | $0.0023^{+0.0042}_{-0.0020}$    | $100\theta_{s,\text{eq}}$   | 0.4520   | $0.456^{+0.012}_{-0.0081}$      | $\chi_{\text{CMB}}^2$       | 11928.1  | $11945.8 (\nu: 18.5)$     |
| $\Omega_m h^3$                                     | 0.09703  | $0.0979^{+0.0045}_{-0.0024}$    | $H(0.15)$                   | 73.24    | $73.3^{+1.5}_{-1.2}$            | $\chi_{\text{BAO}}^2$       | 5.45     | $6.3 (\nu: 0.8)$          |
| $\sigma_8$   | 0.8093   | $0.795^{+0.032}_{-0.037}$       | $D_M(0.15)$                 | 638.0    | $637^{+11}_{-14}$               |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 12970.74$ ;  $\Delta\chi_{\text{eff}}^2 = 0.26$ ;  $\bar{\chi}_{\text{eff}}^2 = 12994.91$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 2.52$ ;  $R - 1 = 0.03797$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.02 ( $\Delta$  -0.01) MGS: 1.34 ( $\Delta$  0.06) DR12BAO: 4.09 ( $\Delta$  -0.14) CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb.consext8: 9.02 ( $\Delta$  0.06) small\_100x143\_offlike5\_EE\_Aplanck 396.12 ( $\Delta$  0.07) commander\_dx12.v3.2.29: 22.86 ( $\Delta$  0.09) CamSpec like\_10.7HM\_1400\_unified: 11500.05 ( $\Delta$  -0.12) SN - JLA Pantheon18: 1034.94 ( $\Delta$  -0.04)



# 7.15 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Aver15

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02239^{+0.00029}_{-0.00028}$ | $S_8$                       | $0.808^{+0.033}_{-0.036}$       | $H(0.38)$                   | $83.3^{+1.1}_{-0.85}$     |
| $\Omega_c h^2$                                     | $0.1186^{+0.0057}_{-0.0060}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | $1525^{+20}_{-24}$        |
| $100\theta_{MC}$                                   | $1.04085^{+0.00061}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.022}_{-0.026}$       | $H(0.51)$                   | $90.0^{+1.1}_{-0.77}$     |
| $\tau$   | $0.056^{+0.016}_{-0.014}$       | $\sigma_8/h^{0.5}$          | $0.962^{+0.034}_{-0.041}$       | $D_M(0.51)$                 | $1975^{+24}_{-30}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.579$                       | $r_{\text{drag}} h$         | $99.4^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.7^{+1.1}_{-0.73}$     |
| $N_{\text{eff}}$                                   | $< 3.28$                        | $\langle d^2 \rangle^{1/2}$ | $2.429^{+0.040}_{-0.040}$       | $D_M(0.61)$                 | $2298^{+27}_{-33}$        |
| $\ln(10^{10} A_s)$                                 | $3.047^{+0.031}_{-0.029}$       | $z_{\text{re}}$             | $7.9^{+1.5}_{-1.4}$             | $H(2.33)$                   | $237.1^{+2.7}_{-2.1}$     |
| $n_s$  | $0.9684^{+0.0099}_{-0.0095}$    | $10^9 A_s$                  | $2.106^{+0.067}_{-0.060}$       | $D_M(2.33)$                 | $5741^{+40}_{-66}$        |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0051}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.024}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.447^{+0.018}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{40}$                    | $1223^{+24}_{-25}$              | $\sigma_8(0.15)$            | $0.732^{+0.028}_{-0.033}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5726^{+76}_{-78}$              | $f\sigma_8(0.38)$           | $0.465^{+0.018}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2537^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.649^{+0.026}_{-0.030}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.7^{+9.2}_{-9.3}$           | $f\sigma_8(0.51)$           | $0.464^{+0.017}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.30$                        | $D_{2000}$                  | $229.9^{+3.1}_{-3.2}$           | $\sigma_8(0.51)$            | $0.607^{+0.024}_{-0.028}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | $0.9684^{+0.0099}_{-0.0095}$    | $f\sigma_8(0.61)$           | $0.459^{+0.017}_{-0.020}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P$                       | $0.2464^{+0.0021}_{-0.0011}$    | $\sigma_8(0.61)$            | $0.578^{+0.023}_{-0.027}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_P^{\text{BBN}}$          | $0.2477^{+0.0022}_{-0.0011}$    | $f\sigma_8(2.33)$           | $0.292^{+0.012}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.609^{+0.066}_{-0.062}$       | $\sigma_8(2.33)$            | $0.300^{+0.013}_{-0.014}$ |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.743^{+0.093}_{-0.16}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1090.00^{+0.54}_{-0.49}$       | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.0^{+1.1}_{-1.6}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04100^{+0.00063}_{-0.00071}$ | $\chi_{\text{lensing}}^2$   | $9.4 (\nu: 0.5)$          |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.83^{+0.10}_{-0.15}$         | $\chi_{\text{small}}^2$     | $397.3 (\nu: 2.0)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.06^{+0.79}_{-0.76}$       | $\chi_{\text{lowl}}^2$      | $22.83 (\nu: 0.4)$        |
| $c_{TE}$   | $0.9970^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.7}$           | $\chi_{\text{CamSpec}}^2$   | $11515.7 (\nu: 16.2)$     |
| $c_{EE}$   | $0.9930^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Aver15}}^2$    | $0.56 (\nu: 0.1)$         |
| $H_0$  | $67.8^{+1.2}_{-1.1}$            | $100\theta_D$               | $0.16096^{+0.00053}_{-0.00047}$ | $\chi_{\text{6DF}}^2$       | $0.074 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | $0.688^{+0.012}_{-0.013}$       | $z_{\text{eq}}$             | $3336^{+83}_{-110}$             | $\chi_{\text{MGS}}^2$       | $1.16 (\nu: 0.1)$         |
| $\Omega_m$   | $0.312^{+0.013}_{-0.012}$       | $k_{\text{eq}}$             | $0.01026^{+0.00027}_{-0.00031}$ | $\chi_{\text{DR12BAO}}^2$   | $5.3 (\nu: 1.5)$          |
| $\Omega_m h^2$                                     | $0.1436^{+0.0035}_{-0.0029}$    | $100\theta_{\text{eq}}$     | $0.827^{+0.024}_{-0.017}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | $0.0025^{+0.0045}_{-0.0020}$    | $100\theta_{s,\text{eq}}$   | $0.456^{+0.013}_{-0.0087}$      | $\chi_{\text{CMB}}^2$       | $11945.3 (\nu: 17.7)$     |
| $\Omega_m h^3$                                     | $0.0973^{+0.0032}_{-0.0018}$    | $H(0.15)$                   | $73.1^{+1.2}_{-1.0}$            | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 1.1)$          |
| $\sigma_8$   | $0.792^{+0.030}_{-0.036}$       | $D_M(0.15)$                 | $639.4^{+9.6}_{-11}$            |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11960.11; R - 1 = 0.03672$$



**7.16 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Cooke17\_Aver15**

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02238^{+0.00029}_{-0.00028}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.020}$       | $H(0.51)$                   | $90.0^{+1.1}_{-0.76}$     |
| $\Omega_c h^2$                                     | $0.1186^{+0.0055}_{-0.0059}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.022}_{-0.026}$       | $D_M(0.51)$                 | $1975^{+24}_{-29}$        |
| $100\theta_{MC}$                                   | $1.04085^{+0.00061}_{-0.00063}$ | $\sigma_8/h^{0.5}$          | $0.962^{+0.033}_{-0.041}$       | $H(0.61)$                   | $95.7^{+1.1}_{-0.71}$     |
| $\tau$   | $0.056^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$         | $99.4^{+1.6}_{-1.6}$            | $D_M(0.61)$                 | $2298^{+27}_{-33}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.581$                       | $\langle d^2 \rangle^{1/2}$ | $2.429^{+0.040}_{-0.041}$       | $H(2.33)$                   | $237.1^{+2.7}_{-2.1}$     |
| $N_{\text{eff}}$                                   | $< 3.27$                        | $z_{\text{re}}$             | $7.9^{+1.5}_{-1.4}$             | $D_M(2.33)$                 | $5741^{+39}_{-64}$        |
| $\ln(10^{10} A_s)$                                 | $3.047^{+0.031}_{-0.029}$       | $10^9 A_s$                  | $2.105^{+0.066}_{-0.060}$       | $f\sigma_8(0.15)$           | $0.447^{+0.018}_{-0.020}$ |
| $n_s$  | $0.9683^{+0.0098}_{-0.0095}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.024}_{-0.023}$       | $\sigma_8(0.15)$            | $0.732^{+0.028}_{-0.033}$ |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0051}$    | $D_{40}$                    | $1223^{+24}_{-25}$              | $f\sigma_8(0.38)$           | $0.465^{+0.017}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{220}$                   | $5725^{+75}_{-78}$              | $\sigma_8(0.38)$            | $0.649^{+0.025}_{-0.030}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{810}$                   | $2537^{+26}_{-26}$              | $f\sigma_8(0.51)$           | $0.464^{+0.017}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{1420}$                  | $815.7^{+9.2}_{-9.2}$           | $\sigma_8(0.51)$            | $0.607^{+0.024}_{-0.028}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{2000}$                  | $229.9^{+3.1}_{-3.2}$           | $f\sigma_8(0.61)$           | $0.459^{+0.017}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.30$                        | $n_{s,0.002}$               | $0.9683^{+0.0098}_{-0.0095}$    | $\sigma_8(0.61)$            | $0.578^{+0.023}_{-0.027}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | $0.2464^{+0.0021}_{-0.0011}$    | $f\sigma_8(2.33)$           | $0.291^{+0.012}_{-0.014}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P^{\text{BBN}}$          | $0.2477^{+0.0021}_{-0.0011}$    | $\sigma_8(2.33)$            | $0.300^{+0.012}_{-0.014}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $10^5 D/H$                  | $2.609^{+0.062}_{-0.059}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $A^{\text{kSZ}}$                                   | —                               | $\text{Age/Gyr}$            | $13.745^{+0.091}_{-0.15}$       | $f_{2000}^{217}$            | $107.4^{+3.9}_{-3.8}$     |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.00^{+0.51}_{-0.47}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $r_*$                       | $144.0^{+1.1}_{-1.6}$           | $\chi_{\text{lensing}}^2$   | $9.4 (\nu: 0.5)$          |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04100^{+0.00063}_{-0.00069}$ | $\chi_{\text{small}}^2$     | $397.3 (\nu: 2.0)$        |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.02^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.15}$         | $\chi_{\text{lowl}}^2$      | $22.84 (\nu: 0.4)$        |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | $1060.05^{+0.79}_{-0.75}$       | $\chi_{\text{CamSpec}}^2$   | $11515.6 (\nu: 16.1)$     |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.6}$           | $\chi_{\text{Aver15}}^2$    | $0.55 (\nu: 0.1)$         |
| $c_{TE}$   | $0.9970^{+0.0096}_{-0.0097}$    | $k_D$                       | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Cooke17}}^2$   | $0.12 (\nu: 0.0)$         |
| $c_{EE}$   | $0.9930^{+0.0097}_{-0.0097}$    | $100\theta_D$               | $0.16096^{+0.00050}_{-0.00045}$ | $\chi_{6\text{DF}}^2$       | $0.074 (\nu: 0.0)$        |
| $H_0$  | $67.8^{+1.2}_{-1.1}$            | $z_{\text{eq}}$             | $3336^{+83}_{-110}$             | $\chi_{\text{MGS}}^2$       | $1.16 (\nu: 0.1)$         |
| $\Omega_\Lambda$                                   | $0.688^{+0.012}_{-0.012}$       | $k_{\text{eq}}$             | $0.01026^{+0.00026}_{-0.00031}$ | $\chi_{\text{DR12BAO}}^2$   | $5.3 (\nu: 1.5)$          |
| $\Omega_m$   | $0.312^{+0.012}_{-0.012}$       | $100\theta_{\text{eq}}$     | $0.827^{+0.024}_{-0.017}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_m h^2$                                     | $0.1435^{+0.0034}_{-0.0029}$    | $100\theta_{s,\text{eq}}$   | $0.456^{+0.013}_{-0.0087}$      | $\chi_{\text{CMB}}^2$       | $11945.2 (\nu: 17.6)$     |
| $\Omega_\nu h^2$                                   | $0.0025^{+0.0045}_{-0.0020}$    | $H(0.15)$                   | $73.1^{+1.2}_{-0.99}$           | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 1.0)$          |
| $\Omega_m h^3$                                     | $0.0973^{+0.0031}_{-0.0018}$    | $D_M(0.15)$                 | $639.5^{+9.5}_{-11}$            | $\chi_{\text{Abund}}^2$     | $0.67 (\nu: 0.1)$         |
| $\sigma_8$   | $0.792^{+0.030}_{-0.036}$       | $H(0.38)$                   | $83.3^{+1.1}_{-0.84}$           |                             |                           |
| $S_8$  | $0.808^{+0.032}_{-0.036}$       | $D_M(0.38)$                 | $1525^{+20}_{-24}$              |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11960.15; R - 1 = 0.03562$$



# 7.17 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02241^{+0.00031}_{-0.00029}$ | $S_8$                       | $0.810^{+0.032}_{-0.036}$       | $H(0.38)$                   | $83.4^{+1.5}_{-1.0}$      |
| $\Omega_c h^2$                                     | $0.1192^{+0.0065}_{-0.0066}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | $1522^{+24}_{-30}$        |
| $100\theta_{MC}$                                   | $1.04081^{+0.00065}_{-0.00070}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.593^{+0.023}_{-0.026}$       | $H(0.51)$                   | $90.2^{+1.5}_{-0.96}$     |
| $\tau$   | $0.057^{+0.014}_{-0.013}$       | $\sigma_8/h^{0.5}$          | $0.963^{+0.033}_{-0.041}$       | $D_M(0.51)$                 | $1971^{+29}_{-38}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.562$                       | $r_{\text{drag}} h$         | $99.5^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.9^{+1.5}_{-0.92}$     |
| $N_{\text{eff}}$                                   | $< 3.36$                        | $\langle d^2 \rangle^{1/2}$ | $2.428^{+0.040}_{-0.040}$       | $D_M(0.61)$                 | $2293^{+32}_{-43}$        |
| $\ln(10^{10} A_s)$                                 | $3.049^{+0.029}_{-0.028}$       | $z_{\text{re}}$             | $7.9^{+1.3}_{-1.4}$             | $H(2.33)$                   | $237.5^{+3.5}_{-2.5}$     |
| $n_s$  | $0.969^{+0.011}_{-0.010}$       | $10^9 A_s$                  | $2.110^{+0.062}_{-0.058}$       | $D_M(2.33)$                 | $5730^{+51}_{-88}$        |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | $1.883^{+0.027}_{-0.024}$       | $f\sigma_8(0.15)$           | $0.448^{+0.018}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $D_{40}$                    | $1222^{+24}_{-26}$              | $\sigma_8(0.15)$            | $0.734^{+0.030}_{-0.035}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5726^{+76}_{-78}$              | $f\sigma_8(0.38)$           | $0.466^{+0.018}_{-0.021}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2538^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.650^{+0.027}_{-0.031}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.6^{+9.3}_{-9.2}$           | $f\sigma_8(0.51)$           | $0.465^{+0.018}_{-0.021}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.34$                        | $D_{2000}$                  | $229.8^{+3.2}_{-3.4}$           | $\sigma_8(0.51)$            | $0.609^{+0.026}_{-0.029}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | $0.969^{+0.011}_{-0.010}$       | $f\sigma_8(0.61)$           | $0.460^{+0.018}_{-0.021}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_{\text{P}}$              | $0.2468^{+0.0029}_{-0.0015}$    | $\sigma_8(0.61)$            | $0.579^{+0.024}_{-0.028}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2481^{+0.0029}_{-0.0015}$    | $f\sigma_8(2.33)$           | $0.292^{+0.013}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 \text{D}/\text{H}$    | $2.614^{+0.077}_{-0.068}$       | $\sigma_8(2.33)$            | $0.301^{+0.013}_{-0.015}$ |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.72^{+0.12}_{-0.21}$         | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1090.04^{+0.58}_{-0.54}$       | $f_{2000}^{217}$            | $107.5^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $143.8^{+1.3}_{-2.1}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04094^{+0.00071}_{-0.00076}$ | $\chi_{\text{lensing}}^2$   | $9.46 (\nu: 0.5)$         |
| $c_{100}$  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.81^{+0.13}_{-0.19}$         | $\chi_{\text{small}}^2$     | $397.3 (\nu: 2.1)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.15^{+0.95}_{-0.86}$       | $\chi_{\text{lowl}}^2$      | $22.72 (\nu: 0.4)$        |
| $c_{TE}$   | $0.9971^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | $146.4^{+1.4}_{-2.2}$           | $\chi_{\text{CamSpec}}^2$   | $11516.0 (\nu: 16.9)$     |
| $c_{EE}$   | $0.9933^{+0.0099}_{-0.0099}$    | $k_{\text{D}}$              | $0.1413^{+0.0016}_{-0.0012}$    | $\chi_{6\text{DF}}^2$       | $0.071 (\nu: 0.0)$        |
| $H_0$  | $67.9^{+1.5}_{-1.3}$            | $100\theta_{\text{D}}$      | $0.16102^{+0.00066}_{-0.00054}$ | $\chi_{\text{MGS}}^2$       | $1.19 (\nu: 0.1)$         |
| $\Omega_{\Lambda}$                                 | $0.688^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3338^{+80}_{-110}$             | $\chi_{\text{DR12BAO}}^2$   | $5.2 (\nu: 1.5)$          |
| $\Omega_{\text{m}}$                                | $0.312^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01028^{+0.00028}_{-0.00033}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$          |
| $\Omega_{\text{m}} h^2$                            | $0.1440^{+0.0043}_{-0.0034}$    | $100\theta_{\text{eq}}$     | $0.826^{+0.023}_{-0.016}$       | $\chi_{\text{CMB}}^2$       | $11945.5 (\nu: 18.3)$     |
| $\Omega_{\nu} h^2$                                 | $0.0024^{+0.0044}_{-0.0021}$    | $100\theta_{\text{s,eq}}$   | $0.456^{+0.012}_{-0.0084}$      | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 1.0)$          |
| $\Omega_{\text{m}} h^3$                            | $0.0979^{+0.0043}_{-0.0024}$    | $H(0.15)$                   | $73.3^{+1.5}_{-1.2}$            |                             |                           |
| $\sigma_8$   | $0.794^{+0.032}_{-0.037}$       | $D_M(0.15)$                 | $638^{+11}_{-14}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11959.80; \Delta\bar{\chi}_{\text{eff}}^2 = 2.54; R - 1 = 0.03599$$



7.18 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02242^{+0.00032}_{-0.00029}$ | $S_8$                       | $0.809^{+0.032}_{-0.035}$       | $H(0.38)$                   | $83.5^{+1.5}_{-1.0}$      |
| $\Omega_c h^2$                                     | $0.1192^{+0.0066}_{-0.0066}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.019}$       | $D_M(0.38)$                 | $1520^{+24}_{-31}$        |
| $100\theta_{MC}$                                   | $1.04082^{+0.00064}_{-0.00072}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.594^{+0.023}_{-0.026}$       | $H(0.51)$                   | $90.3^{+1.6}_{-0.97}$     |
| $\tau$   | $0.057^{+0.014}_{-0.013}$       | $\sigma_8/h^{0.5}$          | $0.964^{+0.033}_{-0.040}$       | $D_M(0.51)$                 | $1969^{+29}_{-39}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.534$                       | $r_{\text{drag}} h$         | $99.6^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.9^{+1.6}_{-0.94}$     |
| $N_{\text{eff}}$                                   | $< 3.37$                        | $\langle d^2 \rangle^{1/2}$ | $2.426^{+0.040}_{-0.041}$       | $D_M(0.61)$                 | $2291^{+32}_{-44}$        |
| $\ln(10^{10} A_s)$                                 | $3.050^{+0.030}_{-0.028}$       | $z_{\text{re}}$             | $8.0^{+1.3}_{-1.4}$             | $H(2.33)$                   | $237.4^{+3.6}_{-2.5}$     |
| $n_s$  | $0.970^{+0.011}_{-0.010}$       | $10^9 A_s$                  | $2.111^{+0.063}_{-0.058}$       | $D_M(2.33)$                 | $5728^{+52}_{-91}$        |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | $1.883^{+0.028}_{-0.024}$       | $f\sigma_8(0.15)$           | $0.448^{+0.017}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $243^{+50}_{-50}$               | $D_{40}$                    | $1221^{+24}_{-26}$              | $\sigma_8(0.15)$            | $0.735^{+0.030}_{-0.034}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5727^{+76}_{-78}$              | $f\sigma_8(0.38)$           | $0.466^{+0.018}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2538^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.651^{+0.027}_{-0.031}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.7^{+9.2}_{-9.2}$           | $f\sigma_8(0.51)$           | $0.465^{+0.018}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.29$                        | $D_{2000}$                  | $229.8^{+3.2}_{-3.4}$           | $\sigma_8(0.51)$            | $0.610^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.970^{+0.011}_{-0.010}$       | $f\sigma_8(0.61)$           | $0.460^{+0.018}_{-0.020}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P$                       | $0.2468^{+0.0030}_{-0.0015}$    | $\sigma_8(0.61)$            | $0.580^{+0.024}_{-0.028}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_P^{\text{BBN}}$          | $0.2481^{+0.0030}_{-0.0015}$    | $f\sigma_8(2.33)$           | $0.293^{+0.012}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.614^{+0.079}_{-0.069}$       | $\sigma_8(2.33)$            | $0.302^{+0.013}_{-0.015}$ |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.71^{+0.12}_{-0.22}$         | $f_{2000}^{143}$            | $31^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | $1090.02^{+0.58}_{-0.54}$       | $f_{2000}^{217}$            | $107.4^{+4.0}_{-3.9}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $143.8^{+1.4}_{-2.2}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04094^{+0.00072}_{-0.00077}$ | $\chi_{\text{lensing}}^2$   | $9.5 (\nu: 0.5)$          |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.81^{+0.13}_{-0.20}$         | $\chi_{\text{small}}^2$     | $397.4 (\nu: 2.2)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.17^{+0.98}_{-0.86}$       | $\chi_{\text{lowl}}^2$      | $22.66 (\nu: 0.4)$        |
| $c_{TE}$   | $0.9971^{+0.0097}_{-0.0097}$    | $r_{\text{drag}}$           | $146.4^{+1.4}_{-2.2}$           | $\chi_{\text{CamSpec}}^2$   | $11516.1 (\nu: 17.0)$     |
| $c_{EE}$   | $0.993^{+0.010}_{-0.010}$       | $k_D$                       | $0.1413^{+0.0017}_{-0.0013}$    | $\chi_{\text{JLA}}^2$       | $1035.11 (\nu: 0.1)$      |
| $H_0$  | $68.0^{+1.6}_{-1.3}$            | $100\theta_D$               | $0.16102^{+0.00067}_{-0.00054}$ | $\chi_{\text{6DF}}^2$       | $0.059 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | $0.689^{+0.012}_{-0.013}$       | $z_{\text{eq}}$             | $3337^{+77}_{-110}$             | $\chi_{\text{MGS}}^2$       | $1.25 (\nu: 0.1)$         |
| $\Omega_m$   | $0.311^{+0.013}_{-0.012}$       | $k_{\text{eq}}$             | $0.01028^{+0.00028}_{-0.00032}$ | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$          |
| $\Omega_m h^2$                                     | $0.1439^{+0.0044}_{-0.0033}$    | $100\theta_{\text{eq}}$     | $0.826^{+0.022}_{-0.016}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | $0.0023^{+0.0042}_{-0.0020}$    | $100\theta_{s,\text{eq}}$   | $0.456^{+0.012}_{-0.0081}$      | $\chi_{\text{CMB}}^2$       | $11945.7 (\nu: 18.5)$     |
| $\Omega_m h^3$                                     | $0.0979^{+0.0045}_{-0.0024}$    | $H(0.15)$                   | $73.3^{+1.5}_{-1.2}$            | $\chi_{\text{BAO}}^2$       | $6.3 (\nu: 0.8)$          |
| $\sigma_8$   | $0.795^{+0.031}_{-0.037}$       | $D_M(0.15)$                 | $637^{+11}_{-14}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 12994.82; \Delta\bar{\chi}_{\text{eff}}^2 = 2.57; R - 1 = 0.03782$$



7.19 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Aver15\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02239^{+0.00029}_{-0.00029}$ | $S_8$                       | $0.809^{+0.033}_{-0.036}$       | $H(0.38)$                   | $83.3^{+1.1}_{-0.85}$     |
| $\Omega_c h^2$                                     | $0.1186^{+0.0057}_{-0.0060}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.020}$       | $D_M(0.38)$                 | $1525^{+20}_{-24}$        |
| $100\theta_{MC}$                                   | $1.04085^{+0.00061}_{-0.00064}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.022}_{-0.026}$       | $H(0.51)$                   | $90.0^{+1.1}_{-0.78}$     |
| $\tau$   | $0.057^{+0.014}_{-0.013}$       | $\sigma_8/h^{0.5}$          | $0.962^{+0.033}_{-0.041}$       | $D_M(0.51)$                 | $1975^{+24}_{-30}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.581$                       | $r_{\text{drag}} h$         | $99.5^{+1.6}_{-1.6}$            | $H(0.61)$                   | $95.7^{+1.2}_{-0.73}$     |
| $N_{\text{eff}}$                                   | $< 3.28$                        | $\langle d^2 \rangle^{1/2}$ | $2.429^{+0.040}_{-0.040}$       | $D_M(0.61)$                 | $2298^{+27}_{-34}$        |
| $\ln(10^{10} A_s)$                                 | $3.048^{+0.029}_{-0.027}$       | $z_{\text{re}}$             | $7.9^{+1.3}_{-1.4}$             | $H(2.33)$                   | $237.1^{+2.7}_{-2.1}$     |
| $n_s$  | $0.9685^{+0.0099}_{-0.0095}$    | $10^9 A_s$                  | $2.108^{+0.060}_{-0.056}$       | $D_M(2.33)$                 | $5740^{+40}_{-66}$        |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0051}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.024}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.447^{+0.018}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{40}$                    | $1223^{+24}_{-25}$              | $\sigma_8(0.15)$            | $0.732^{+0.028}_{-0.033}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{220}$                   | $5726^{+76}_{-78}$              | $f\sigma_8(0.38)$           | $0.465^{+0.018}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{810}$                   | $2537^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.649^{+0.025}_{-0.030}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{1420}$                  | $815.7^{+9.2}_{-9.3}$           | $f\sigma_8(0.51)$           | $0.464^{+0.017}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.30$                        | $D_{2000}$                  | $229.9^{+3.1}_{-3.2}$           | $\sigma_8(0.51)$            | $0.607^{+0.024}_{-0.028}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | $0.9685^{+0.0099}_{-0.0095}$    | $f\sigma_8(0.61)$           | $0.459^{+0.017}_{-0.020}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P$                       | $0.2464^{+0.0022}_{-0.0011}$    | $\sigma_8(0.61)$            | $0.578^{+0.023}_{-0.027}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $Y_P^{\text{BBN}}$          | $0.2477^{+0.0022}_{-0.0011}$    | $f\sigma_8(2.33)$           | $0.292^{+0.012}_{-0.014}$ |
| $A^{\text{kSZ}}$                                   | —                               | $10^5 D/H$                  | $2.609^{+0.066}_{-0.062}$       | $\sigma_8(2.33)$            | $0.301^{+0.012}_{-0.014}$ |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | $13.743^{+0.094}_{-0.16}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1090.00^{+0.54}_{-0.49}$       | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.8}$     |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.0^{+1.1}_{-1.6}$           | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.02^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04099^{+0.00063}_{-0.00071}$ | $\chi_{\text{lensing}}^2$   | $9.41 (\nu: 0.5)$         |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.83^{+0.10}_{-0.15}$         | $\chi_{\text{small}}^2$     | $397.3 (\nu: 2.1)$        |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1060.07^{+0.79}_{-0.77}$       | $\chi_{\text{lowl}}^2$      | $22.83 (\nu: 0.4)$        |
| $c_{TE}$   | $0.9970^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.7}$           | $\chi_{\text{CamSpec}}^2$   | $11515.7 (\nu: 16.2)$     |
| $c_{EE}$   | $0.9930^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Aver15}}^2$    | $0.57 (\nu: 0.1)$         |
| $H_0$  | $67.8^{+1.2}_{-1.1}$            | $100\theta_D$               | $0.16096^{+0.00054}_{-0.00047}$ | $\chi_{\text{6DF}}^2$       | $0.072 (\nu: 0.0)$        |
| $\Omega_\Lambda$                                   | $0.688^{+0.012}_{-0.013}$       | $z_{\text{eq}}$             | $3336^{+83}_{-110}$             | $\chi_{\text{MGS}}^2$       | $1.17 (\nu: 0.1)$         |
| $\Omega_m$   | $0.312^{+0.013}_{-0.012}$       | $k_{\text{eq}}$             | $0.01026^{+0.00027}_{-0.00031}$ | $\chi_{\text{DR12BAO}}^2$   | $5.2 (\nu: 1.5)$          |
| $\Omega_m h^2$                                     | $0.1436^{+0.0035}_{-0.0029}$    | $100\theta_{\text{eq}}$     | $0.827^{+0.024}_{-0.017}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_\nu h^2$                                   | $0.0025^{+0.0044}_{-0.0020}$    | $100\theta_{s,\text{eq}}$   | $0.456^{+0.013}_{-0.0087}$      | $\chi_{\text{CMB}}^2$       | $11945.2 (\nu: 17.6)$     |
| $\Omega_m h^3$                                     | $0.0973^{+0.0032}_{-0.0018}$    | $H(0.15)$                   | $73.1^{+1.2}_{-1.0}$            | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 1.0)$          |
| $\sigma_8$   | $0.793^{+0.030}_{-0.036}$       | $D_M(0.15)$                 | $639.3^{+9.7}_{-11}$            |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11960.01; R - 1 = 0.03614$$



## 7.20 base\_nnu\_meffsterile\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Cooke17\_Aver15\_zre6p5

| Parameter  | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                                     | $0.02239^{+0.00029}_{-0.00028}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.018}_{-0.020}$       | $H(0.51)$                   | $90.0^{+1.1}_{-0.76}$     |
| $\Omega_c h^2$                                     | $0.1186^{+0.0055}_{-0.0060}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.592^{+0.022}_{-0.026}$       | $D_M(0.51)$                 | $1975^{+24}_{-29}$        |
| $100\theta_{MC}$                                   | $1.04085^{+0.00061}_{-0.00063}$ | $\sigma_8/h^{0.5}$          | $0.962^{+0.033}_{-0.041}$       | $H(0.61)$                   | $95.7^{+1.1}_{-0.72}$     |
| $\tau$   | $0.057^{+0.014}_{-0.013}$       | $r_{\text{drag}} h$         | $99.4^{+1.6}_{-1.6}$            | $D_M(0.61)$                 | $2298^{+27}_{-33}$        |
| $m_{\nu, \text{sterile}}^{\text{eff}} [\text{eV}]$ | $< 0.584$                       | $\langle d^2 \rangle^{1/2}$ | $2.430^{+0.040}_{-0.040}$       | $H(2.33)$                   | $237.1^{+2.7}_{-2.1}$     |
| $N_{\text{eff}}$                                   | $< 3.27$                        | $z_{\text{re}}$             | $7.9^{+1.3}_{-1.4}$             | $D_M(2.33)$                 | $5741^{+39}_{-65}$        |
| $\ln(10^{10} A_s)$                                 | $3.048^{+0.028}_{-0.027}$       | $10^9 A_s$                  | $2.107^{+0.060}_{-0.056}$       | $f\sigma_8(0.15)$           | $0.447^{+0.018}_{-0.020}$ |
| $n_s$  | $0.9684^{+0.0098}_{-0.0094}$    | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.024}_{-0.023}$       | $\sigma_8(0.15)$            | $0.732^{+0.028}_{-0.033}$ |
| $y_{\text{cal}}$                                   | $1.0008^{+0.0049}_{-0.0051}$    | $D_{40}$                    | $1223^{+24}_{-25}$              | $f\sigma_8(0.38)$           | $0.465^{+0.017}_{-0.020}$ |
| $A_{100}^{\text{PS}}$                              | $242^{+50}_{-50}$               | $D_{220}$                   | $5725^{+75}_{-78}$              | $\sigma_8(0.38)$            | $0.649^{+0.025}_{-0.030}$ |
| $A_{143}^{\text{PS}}$                              | $41^{+20}_{-20}$                | $D_{810}$                   | $2537^{+26}_{-26}$              | $f\sigma_8(0.51)$           | $0.464^{+0.017}_{-0.020}$ |
| $A_{217}^{\text{PS}}$                              | $102^{+30}_{-30}$               | $D_{1420}$                  | $815.7^{+9.1}_{-9.2}$           | $\sigma_8(0.51)$            | $0.607^{+0.024}_{-0.028}$ |
| $A_{217}^{\text{CIB}}$                             | $40^{+10}_{-10}$                | $D_{2000}$                  | $229.9^{+3.1}_{-3.2}$           | $f\sigma_8(0.61)$           | $0.459^{+0.017}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$                             | $< 7.30$                        | $n_{s,0.002}$               | $0.9684^{+0.0098}_{-0.0094}$    | $\sigma_8(0.61)$            | $0.578^{+0.023}_{-0.027}$ |
| $r_{143 \times 217}^{\text{PS}}$                   | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | $0.2464^{+0.0021}_{-0.0011}$    | $f\sigma_8(2.33)$           | $0.292^{+0.012}_{-0.014}$ |
| $r_{143 \times 217}^{\text{CIB}}$                  | —                               | $Y_P^{\text{BBN}}$          | $0.2477^{+0.0021}_{-0.0011}$    | $\sigma_8(2.33)$            | $0.300^{+0.012}_{-0.014}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$               | —                               | $10^5 D/H$                  | $2.609^{+0.062}_{-0.059}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $A^{\text{kSZ}}$                                   | —                               | Age/Gyr                     | $13.744^{+0.092}_{-0.15}$       | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.8}$     |
| $A_{100}^{\text{dust}}$                            | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.00^{+0.51}_{-0.47}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $A_{143}^{\text{dust}}$                            | $0.96^{+0.34}_{-0.34}$          | $r_*$                       | $144.0^{+1.1}_{-1.6}$           | $\chi_{\text{lensing}}^2$   | $9.40 (\nu: 0.5)$         |
| $A_{217}^{\text{dust}}$                            | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.04100^{+0.00063}_{-0.00069}$ | $\chi_{\text{small}}^2$     | $397.3 (\nu: 2.1)$        |
| $A_{143 \times 217}^{\text{dust}}$                 | $1.02^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $13.84^{+0.10}_{-0.15}$         | $\chi_{\text{lowl}}^2$      | $22.84 (\nu: 0.4)$        |
| $c_{100}$  | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1060.05^{+0.79}_{-0.76}$       | $\chi_{\text{CamSpec}}^2$   | $11515.6 (\nu: 16.1)$     |
| $c_{217}$  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $146.7^{+1.1}_{-1.6}$           | $\chi_{\text{Aver15}}^2$    | $0.56 (\nu: 0.1)$         |
| $c_{TE}$   | $0.9970^{+0.0096}_{-0.0097}$    | $k_D$                       | $0.1411^{+0.0013}_{-0.0010}$    | $\chi_{\text{Cooke17}}^2$   | $0.12 (\nu: 0.0)$         |
| $c_{EE}$   | $0.9930^{+0.0097}_{-0.0097}$    | $100\theta_D$               | $0.16096^{+0.00050}_{-0.00045}$ | $\chi_{6\text{DF}}^2$       | $0.073 (\nu: 0.0)$        |
| $H_0$  | $67.8^{+1.2}_{-1.1}$            | $z_{\text{eq}}$             | $3336^{+83}_{-110}$             | $\chi_{\text{MGS}}^2$       | $1.16 (\nu: 0.1)$         |
| $\Omega_\Lambda$                                   | $0.688^{+0.012}_{-0.012}$       | $k_{\text{eq}}$             | $0.01026^{+0.00026}_{-0.00031}$ | $\chi_{\text{DR12BAO}}^2$   | $5.3 (\nu: 1.5)$          |
| $\Omega_m$   | $0.312^{+0.012}_{-0.012}$       | $100\theta_{\text{eq}}$     | $0.827^{+0.024}_{-0.017}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$          |
| $\Omega_m h^2$                                     | $0.1435^{+0.0034}_{-0.0029}$    | $100\theta_{s,\text{eq}}$   | $0.456^{+0.013}_{-0.0087}$      | $\chi_{\text{CMB}}^2$       | $11945.1 (\nu: 17.5)$     |
| $\Omega_\nu h^2$                                   | $0.0025^{+0.0044}_{-0.0020}$    | $H(0.15)$                   | $73.1^{+1.2}_{-1.0}$            | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 1.0)$          |
| $\Omega_m h^3$                                     | $0.0973^{+0.0031}_{-0.0018}$    | $D_M(0.15)$                 | $639.4^{+9.5}_{-11}$            | $\chi_{\text{Abund}}^2$     | $0.67 (\nu: 0.1)$         |
| $\sigma_8$   | $0.792^{+0.030}_{-0.036}$       | $H(0.38)$                   | $83.3^{+1.1}_{-0.84}$           |                             |                           |
| $S_8$  | $0.808^{+0.032}_{-0.036}$       | $D_M(0.38)$                 | $1525^{+20}_{-24}$              |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11960.05; R - 1 = 0.03510$$



## 8 nnu+mnu

### 8.1 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                           | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.02206  | $0.02190^{+0.00072}_{-0.00077}$ | $\sigma_8$                          | 0.820    | $0.776^{+0.066}_{-0.10}$        | $100\theta_{\text{eq}}$     | 0.8085   | $0.804^{+0.026}_{-0.026}$ |
| $\Omega_c h^2$                       | 0.1191   | $0.1190^{+0.0081}_{-0.0075}$    | $S_8$                               | 0.843    | $0.835^{+0.050}_{-0.052}$       | $100\theta_{\text{s,eq}}$   | 0.4471   | $0.445^{+0.013}_{-0.013}$ |
| $100\theta_{\text{MC}}$              | 1.04106  | $1.0409^{+0.0012}_{-0.0012}$    | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | 0.4619   | $0.457^{+0.028}_{-0.029}$       | $H(0.15)$                   | 72.0     | $69.8^{+6.2}_{-6.9}$      |
| $\tau$                               | 0.0516   | $0.051^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | 0.6153   | $0.596^{+0.039}_{-0.051}$       | $D_{\text{M}}(0.15)$        | 650      | $675^{+80}_{-60}$         |
| $\Sigma m_\nu$ [eV]                  | 0.001    | < 0.708                         | $\sigma_8/h^{0.5}$                  | 1.004    | $0.969^{+0.061}_{-0.087}$       | $H(0.38)$                   | 82.1     | $80.3^{+5.4}_{-6.2}$      |
| $N_{\text{eff}}$                     | 2.93     | $2.88^{+0.60}_{-0.56}$          | $r_{\text{drag}} h$                 | 98.8     | $95.4^{+7.3}_{-9.6}$            | $D_{\text{M}}(0.38)$        | 1548     | $1599^{+160}_{-140}$      |
| $\ln(10^{10} A_{\text{s}})$          | 3.0333   | $3.030^{+0.042}_{-0.042}$       | $\langle d^2 \rangle^{1/2}$         | 2.466    | $2.460^{+0.095}_{-0.095}$       | $H(0.51)$                   | 88.8     | $87.3^{+5.2}_{-5.6}$      |
| $n_{\text{s}}$                       | 0.9589   | $0.954^{+0.028}_{-0.030}$       | $z_{\text{re}}$                     | 7.43     | $7.4^{+1.7}_{-1.7}$             | $D_{\text{M}}(0.51)$        | 2005     | $2065^{+190}_{-170}$      |
| $y_{\text{cal}}$                     | 0.99999  | $1.0004^{+0.0049}_{-0.0050}$    | $10^9 A_{\text{s}}$                 | 2.077    | $2.071^{+0.088}_{-0.085}$       | $H(0.61)$                   | 94.5     | $93.1^{+5.0}_{-5.3}$      |
| $A_{100}^{\text{PS}}$                | 238      | $241^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$      | 1.8731   | $1.871^{+0.046}_{-0.046}$       | $D_{\text{M}}(0.61)$        | 2332     | $2398^{+210}_{-190}$      |
| $A_{143}^{\text{PS}}$                | 39.2     | $40^{+20}_{-20}$                | $D_{40}$                            | 1235.8   | $1240^{+45}_{-44}$              | $H(2.33)$                   | 234.9    | $235.7^{+7.5}_{-7.2}$     |
| $A_{217}^{\text{PS}}$                | 100.4    | $102^{+30}_{-30}$               | $D_{220}$                           | 5701     | $5700^{+82}_{-82}$              | $D_{\text{M}}(2.33)$        | 5811     | $5892^{+320}_{-300}$      |
| $A_{217}^{\text{CIB}}$               | 43.8     | $40^{+20}_{-10}$                | $D_{810}$                           | 2530.1   | $2532^{+29}_{-29}$              | $f\sigma_8(0.15)$           | 0.4652   | $0.460^{+0.026}_{-0.028}$ |
| $A_{143}^{\text{tSZ}}$               | 5.44     | < 7.40                          | $D_{1420}$                          | 813.7    | $815^{+10}_{-10}$               | $\sigma_8(0.15)$            | 0.757    | $0.714^{+0.064}_{-0.10}$  |
| $r_{143 \times 217}^{\text{PS}}$     | 0.593    | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                          | 229.96   | $229.9^{+4.6}_{-4.6}$           | $f\sigma_8(0.38)$           | 0.4822   | $0.470^{+0.029}_{-0.036}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.72     | —                               | $n_{\text{s},0.002}$                | 0.9589   | $0.954^{+0.028}_{-0.030}$       | $\sigma_8(0.38)$            | 0.670    | $0.630^{+0.061}_{-0.096}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.13     | —                               | $Y_{\text{P}}$                      | 0.2438   | $0.2428^{+0.0082}_{-0.0082}$    | $f\sigma_8(0.51)$           | 0.4800   | $0.464^{+0.030}_{-0.042}$ |
| $A^{\text{kSZ}}$                     | 1.9      | —                               | $Y_{\text{P}}^{\text{BBN}}$         | 0.2451   | $0.2441^{+0.0082}_{-0.0082}$    | $\sigma_8(0.51)$            | 0.626    | $0.588^{+0.059}_{-0.092}$ |
| $A_{100}^{\text{dust}}$              | 1.001    | $1.01^{+0.39}_{-0.39}$          | $10^5 \text{D}/\text{H}$            | 2.605    | $2.61^{+0.14}_{-0.14}$          | $f\sigma_8(0.61)$           | 0.4744   | $0.457^{+0.031}_{-0.045}$ |
| $A_{143}^{\text{dust}}$              | 0.978    | $0.97^{+0.34}_{-0.35}$          | Age/Gyr                             | 13.91    | $14.10^{+0.75}_{-0.72}$         | $\sigma_8(0.61)$            | 0.596    | $0.559^{+0.057}_{-0.089}$ |
| $A_{217}^{\text{dust}}$              | 0.957    | $0.97^{+0.20}_{-0.20}$          | $z_*$                               | 1090.12  | $1090.3^{+1.1}_{-1.0}$          | $f\sigma_8(2.33)$           | 0.2992   | $0.282^{+0.028}_{-0.043}$ |
| $A_{143 \times 217}^{\text{dust}}$   | 0.996    | $1.03^{+0.32}_{-0.31}$          | $r_*$                               | 145.5    | $145.9^{+5.2}_{-5.2}$           | $\sigma_8(2.33)$            | 0.3087   | $0.289^{+0.032}_{-0.049}$ |
| $c_{100}$                            | 0.99751  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                       | 1.04130  | $1.0413^{+0.0015}_{-0.0014}$    | $f_{2000}^{143}$            | 30.3     | $30^{+7}_{-7}$            |
| $c_{217}$                            | 1.00118  | $1.0012^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | 13.972   | $14.01^{+0.48}_{-0.49}$         | $f_{2000}^{217}$            | 106.89   | $107.3^{+5.0}_{-4.9}$     |
| $H_0$                                | 66.7     | $64.2^{+6.6}_{-7.6}$            | $z_{\text{drag}}$                   | 1059.06  | $1058.6^{+2.4}_{-2.5}$          | $f_{2000}^{143 \times 217}$ | 32.3     | $33^{+5}_{-5}$            |
| $\Omega_{\Lambda}$                   | 0.682    | $0.649^{+0.067}_{-0.096}$       | $r_{\text{drag}}$                   | 148.3    | $148.8^{+5.4}_{-5.4}$           | $\chi_{\text{simall}}^2$    | 395.79   | $396.9 (\nu: 1.4)$        |
| $\Omega_{\text{m}}$                  | 0.318    | $0.351^{+0.096}_{-0.067}$       | $k_{\text{D}}$                      | 0.13982  | $0.1395^{+0.0039}_{-0.0037}$    | $\chi_{\text{lowl}}^2$      | 24.32    | $25.0 (\nu: 3.3)$         |
| $\Omega_{\text{m}} h^2$              | 0.1411   | $0.1431^{+0.0092}_{-0.0089}$    | $100\theta_{\text{D}}$              | 0.16082  | $0.1608^{+0.0014}_{-0.0013}$    | $\chi_{\text{CamSpec}}^2$   | 7048.9   | $7064.2 (\nu: 18.1)$      |
| $\Omega_{\nu} h^2$                   | 0.00001  | < 0.00690                       | $z_{\text{eq}}$                     | 3424     | $3447^{+150}_{-140}$            | $\chi_{\text{prior}}^2$     | 2.1      | $7.6 (\nu: 6.1)$          |
| $\Omega_{\text{m}} h^3$              | 0.0941   | $0.092^{+0.012}_{-0.012}$       | $k_{\text{eq}}$                     | 0.010371 | $0.01040^{+0.00033}_{-0.00032}$ | $\chi_{\text{CMB}}^2$       | 7469.0   | $7486.0 (\nu: 18.0)$      |

Best-fit  $\chi_{\text{eff}}^2 = 7471.08$ ;  $\Delta\chi_{\text{eff}}^2 = -0.66$ ;  $\bar{\chi}_{\text{eff}}^2 = 7493.68$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 2.14$ ;  $R - 1 = 0.00504$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.79 ( $\Delta$  -0.04) commander\_dx12\_v3\_2\_29: 24.32 ( $\Delta$  0.92) CamSpec like\_10.7HM: 7048.88 ( $\Delta$  -1.46)



## 8.2 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.02204  | $0.02187^{+0.00069}_{-0.00076}$ | $S_8$                       | 0.8351   | $0.840^{+0.034}_{-0.033}$       | $H(0.15)$                   | 71.8     | $69.5^{+5.5}_{-6.5}$      |
| $\Omega_c h^2$                       | 0.1176   | $0.1184^{+0.0079}_{-0.0073}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4574   | $0.460^{+0.019}_{-0.018}$       | $D_M(0.15)$                 | 651      | $677^{+70}_{-60}$         |
| $100\theta_{MC}$                     | 1.04112  | $1.0410^{+0.0012}_{-0.0012}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6103   | $0.599^{+0.025}_{-0.030}$       | $H(0.38)$                   | 81.9     | $80.0^{+5.1}_{-5.6}$      |
| $\tau$                               | 0.0506   | $0.051^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | 0.9982   | $0.975^{+0.039}_{-0.052}$       | $D_M(0.38)$                 | 1552     | $1605^{+140}_{-130}$      |
| $\Sigma m_\nu$ [eV]                  | 0.002    | < 0.555                         | $r_{\text{drag}} h$         | 99.1     | $95.4^{+6.6}_{-8.5}$            | $H(0.51)$                   | 88.6     | $87.0^{+4.9}_{-5.2}$      |
| $N_{\text{eff}}$                     | 2.88     | $2.82^{+0.58}_{-0.52}$          | $\langle d^2 \rangle^{1/2}$ | 2.457    | $2.470^{+0.081}_{-0.070}$       | $D_M(0.51)$                 | 2010     | $2073^{+170}_{-160}$      |
| $\ln(10^{10} A_s)$                   | 3.0281   | $3.030^{+0.041}_{-0.040}$       | $z_{\text{re}}$             | 7.30     | $7.4^{+1.6}_{-1.7}$             | $H(0.61)$                   | 94.14    | $92.8^{+4.8}_{-4.9}$      |
| $n_s$                                | 0.9579   | $0.952^{+0.027}_{-0.028}$       | $10^9 A_s$                  | 2.066    | $2.070^{+0.086}_{-0.082}$       | $D_M(0.61)$                 | 2339     | $2407^{+190}_{-170}$      |
| $y_{\text{cal}}$                     | 1.00019  | $1.0004^{+0.0049}_{-0.0051}$    | $10^9 A_s e^{-2\tau}$       | 1.8670   | $1.869^{+0.045}_{-0.045}$       | $H(2.33)$                   | 233.8    | $234.9^{+7.4}_{-7.0}$     |
| $A_{100}^{\text{PS}}$                | 237      | $240^{+50}_{-50}$               | $D_{40}$                    | 1235.9   | $1245^{+42}_{-40}$              | $D_M(2.33)$                 | 5833     | $5912^{+310}_{-280}$      |
| $A_{143}^{\text{PS}}$                | 37.9     | $40^{+20}_{-20}$                | $D_{220}$                   | 5706     | $5700^{+81}_{-81}$              | $f\sigma_8(0.15)$           | 0.4609   | $0.462^{+0.016}_{-0.016}$ |
| $A_{217}^{\text{PS}}$                | 100.5    | $102^{+30}_{-30}$               | $D_{810}$                   | 2529.6   | $2532^{+29}_{-29}$              | $\sigma_8(0.15)$            | 0.752    | $0.717^{+0.056}_{-0.075}$ |
| $A_{217}^{\text{CIB}}$               | 43.8     | $40^{+20}_{-10}$                | $D_{1420}$                  | 814.3    | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4782   | $0.472^{+0.018}_{-0.020}$ |
| $A_{143}^{\text{tSZ}}$               | 5.73     | < 7.45                          | $D_{2000}$                  | 230.32   | $230.3^{+4.5}_{-4.4}$           | $\sigma_8(0.38)$            | 0.666    | $0.633^{+0.054}_{-0.072}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.594    | $0.66^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | 0.9579   | $0.952^{+0.027}_{-0.028}$       | $f\sigma_8(0.51)$           | 0.4763   | $0.467^{+0.021}_{-0.026}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.70     | —                               | $Y_{\text{P}}$              | 0.2430   | $0.2420^{+0.0080}_{-0.0077}$    | $\sigma_8(0.51)$            | 0.623    | $0.591^{+0.052}_{-0.070}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.08     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2443   | $0.2433^{+0.0080}_{-0.0077}$    | $f\sigma_8(0.61)$           | 0.4709   | $0.459^{+0.023}_{-0.030}$ |
| $A^{\text{kSZ}}$                     | 1.4      | —                               | $10^5 D/H$                  | 2.589    | $2.60^{+0.14}_{-0.13}$          | $\sigma_8(0.61)$            | 0.592    | $0.561^{+0.050}_{-0.068}$ |
| $A_{100}^{\text{dust}}$              | 1.009    | $1.00^{+0.39}_{-0.39}$          | Age/Gyr                     | 13.96    | $14.15^{+0.72}_{-0.66}$         | $f\sigma_8(2.33)$           | 0.2976   | $0.283^{+0.025}_{-0.033}$ |
| $A_{143}^{\text{dust}}$              | 0.970    | $0.97^{+0.34}_{-0.35}$          | $z_*$                       | 1089.96  | $1090.2^{+1.1}_{-1.0}$          | $\sigma_8(2.33)$            | 0.3071   | $0.290^{+0.029}_{-0.038}$ |
| $A_{217}^{\text{dust}}$              | 0.962    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 146.2    | $146.4^{+4.9}_{-5.1}$           | $f_{2000}^{143}$            | 29.9     | $30^{+7}_{-7}$            |
| $A_{143 \times 217}^{\text{dust}}$   | 1.011    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04142  | $1.0414^{+0.0015}_{-0.0014}$    | $f_{2000}^{217}$            | 106.59   | $106.9^{+4.9}_{-4.9}$     |
| $c_{100}$                            | 0.99757  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 14.035   | $14.06^{+0.46}_{-0.48}$         | $f_{2000}^{143 \times 217}$ | 32.0     | $32^{+5}_{-5}$            |
| $c_{217}$                            | 1.00119  | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\text{drag}}$           | 1058.87  | $1058.5^{+2.3}_{-2.3}$          | $\chi_{\text{lensing}}^2$   | 8.77     | 9.2 ( $\nu$ : 0.6)        |
| $H_0$                                | 66.5     | $63.9^{+6.1}_{-6.9}$            | $r_{\text{drag}}$           | 149.0    | $149.3^{+5.2}_{-5.3}$           | $\chi_{\text{small}}^2$     | 395.68   | 396.9 ( $\nu$ : 1.4)      |
| $\Omega_\Lambda$                     | 0.684    | $0.649^{+0.061}_{-0.084}$       | $k_{\text{D}}$              | 0.13931  | $0.1391^{+0.0039}_{-0.0036}$    | $\chi_{\text{lowl}}^2$      | 24.30    | 25.4 ( $\nu$ : 3.1)       |
| $\Omega_m$                           | 0.316    | $0.351^{+0.084}_{-0.061}$       | $100\theta_{\text{D}}$      | 0.16068  | $0.1606^{+0.0013}_{-0.0013}$    | $\chi_{\text{CamSpec}}^2$   | 7049.2   | 7063.1 ( $\nu$ : 15.5)    |
| $\Omega_m h^2$                       | 0.1397   | $0.1422^{+0.0089}_{-0.0086}$    | $z_{\text{eq}}$             | 3415     | $3459^{+140}_{-120}$            | $\chi_{\text{prior}}^2$     | 2.0      | 7.6 ( $\nu$ : 6.0)        |
| $\Omega_\nu h^2$                     | 0.00002  | < 0.00539                       | $k_{\text{eq}}$             | 0.010304 | $0.01039^{+0.00032}_{-0.00029}$ | $\chi_{\text{CMB}}^2$       | 7477.9   | 7494.7 ( $\nu$ : 17.9)    |
| $\Omega_m h^3$                       | 0.0930   | $0.091^{+0.012}_{-0.011}$       | $100\theta_{\text{eq}}$     | 0.8102   | $0.802^{+0.023}_{-0.025}$       |                             |          |                           |
| $\sigma_8$                           | 0.814    | $0.780^{+0.056}_{-0.075}$       | $100\theta_{s,\text{eq}}$   | 0.4480   | $0.444^{+0.012}_{-0.013}$       |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 7479.93$ ;  $\Delta\chi_{\text{eff}}^2 = -0.75$ ;  $\bar{\chi}_{\text{eff}}^2 = 7502.27$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 2.03$ ;  $R - 1 = 0.00874$

$\chi_{\text{eff}}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 8.77 ( $\Delta$  -0.14) small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.68 ( $\Delta$  -0.19) commander\_dx12\_v3\_2\_29: 24.30 ( $\Delta$  0.88) CamSpec like\_10.7HM: 7049.15 ( $\Delta$  -1.03)



### 8.3 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022207 | $0.02216^{+0.00046}_{-0.00046}$ | $\Omega_m h^3$                 | 0.0934   | $0.0930^{+0.0092}_{-0.0085}$    | $100\theta_{\text{eq}}$     | 0.8125   | $0.811^{+0.015}_{-0.015}$    |
| $\Omega_c h^2$                       | 0.1173   | $0.1178^{+0.0069}_{-0.0066}$    | $\sigma_8$                     | 0.815    | $0.789^{+0.048}_{-0.063}$       | $100\theta_{\text{s,eq}}$   | 0.4491   | $0.4485^{+0.0077}_{-0.0076}$ |
| $100\theta_{\text{MC}}$              | 1.04115  | $1.04106^{+0.00095}_{-0.00095}$ | $S_8$                          | 0.8299   | $0.823^{+0.035}_{-0.036}$       | $H(0.15)$                   | 72.19    | $71.2^{+3.7}_{-4.2}$         |
| $\tau$                               | 0.0522   | $0.052^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.5}$      | 0.4546   | $0.451^{+0.019}_{-0.020}$       | $D_{\text{M}}(0.15)$        | 647.5    | $659^{+41}_{-38}$            |
| $\Sigma m_\nu [\text{eV}]$           | 0.001    | $< 0.396$                       | $\sigma_8 \Omega_m^{0.25}$     | 0.6086   | $0.596^{+0.029}_{-0.033}$       | $H(0.38)$                   | 82.20    | $81.4^{+3.6}_{-3.8}$         |
| $N_{\text{eff}}$                     | 2.893    | $2.90^{+0.46}_{-0.44}$          | $\sigma_8/h^{0.5}$             | 0.996    | $0.972^{+0.044}_{-0.056}$       | $D_{\text{M}}(0.38)$        | 1544     | $1567^{+88}_{-83}$           |
| $\ln(10^{10} A_s)$                   | 3.0320   | $3.032^{+0.039}_{-0.038}$       | $r_{\text{drag}} h$            | 99.62    | $97.8^{+4.2}_{-5.0}$            | $H(0.51)$                   | 88.85    | $88.2^{+3.5}_{-3.6}$         |
| $n_s$                                | 0.9615   | $0.960^{+0.019}_{-0.019}$       | $\langle d^2 \rangle^{1/2}$    | 2.448    | $2.437^{+0.062}_{-0.062}$       | $D_{\text{M}}(0.51)$        | 2000     | $2027^{+110}_{-100}$         |
| $y_{\text{cal}}$                     | 1.0005   | $1.0005^{+0.0050}_{-0.0052}$    | $z_{\text{re}}$                | 7.43     | $7.4^{+1.6}_{-1.6}$             | $H(0.61)$                   | 94.42    | $93.9^{+3.5}_{-3.5}$         |
| $A_{100}^{\text{PS}}$                | 227.1    | $237^{+50}_{-50}$               | $10^9 A_s$                     | 2.074    | $2.074^{+0.081}_{-0.077}$       | $D_{\text{M}}(0.61)$        | 2328     | $2357^{+120}_{-120}$         |
| $A_{143}^{\text{PS}}$                | 44.4     | $38^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | 1.8684   | $1.868^{+0.040}_{-0.039}$       | $H(2.33)$                   | 233.8    | $234.8^{+6.3}_{-6.1}$        |
| $A_{217}^{\text{PS}}$                | 105.7    | $103^{+30}_{-30}$               | $D_{40}$                       | 1230.8   | $1233^{+32}_{-32}$              | $D_{\text{M}}(2.33)$        | 5818     | $5846^{+210}_{-200}$         |
| $A_{217}^{\text{CIB}}$               | 41.2     | $39^{+10}_{-10}$                | $D_{220}$                      | 5717     | $5717^{+77}_{-81}$              | $f\sigma_8(0.15)$           | 0.4584   | $0.455^{+0.018}_{-0.019}$    |
| $A_{143}^{\text{tSZ}}$               | 6.46     | $< 7.53$                        | $D_{810}$                      | 2534.3   | $2533^{+28}_{-29}$              | $\sigma_8(0.15)$            | 0.753    | $0.727^{+0.046}_{-0.061}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.695    | $0.66^{+0.26}_{-0.26}$          | $D_{1420}$                     | 817.4    | $816.5^{+9.9}_{-10}$            | $f\sigma_8(0.38)$           | 0.4767   | $0.469^{+0.021}_{-0.023}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.82     | —                               | $D_{2000}$                     | 231.57   | $230.9^{+4.1}_{-4.3}$           | $\sigma_8(0.38)$            | 0.667    | $0.643^{+0.043}_{-0.057}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.58     | —                               | $n_{\text{s},0.002}$           | 0.9615   | $0.960^{+0.019}_{-0.019}$       | $f\sigma_8(0.51)$           | 0.4753   | $0.466^{+0.022}_{-0.026}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}$                 | 0.2433   | $0.2433^{+0.0062}_{-0.0062}$    | $\sigma_8(0.51)$            | 0.6242   | $0.602^{+0.041}_{-0.055}$    |
| $A_{100}^{\text{dust}}$              | 1.002    | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.2446   | $0.2446^{+0.0063}_{-0.0063}$    | $f\sigma_8(0.61)$           | 0.4702   | $0.460^{+0.022}_{-0.027}$    |
| $A_{143}^{\text{dust}}$              | 0.970    | $0.96^{+0.34}_{-0.34}$          | $10^5 \text{D}/\text{H}$       | 2.563    | $2.57^{+0.12}_{-0.11}$          | $\sigma_8(0.61)$            | 0.5939   | $0.572^{+0.039}_{-0.053}$    |
| $A_{217}^{\text{dust}}$              | 0.984    | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | 13.928   | $13.99^{+0.51}_{-0.48}$         | $f\sigma_8(2.33)$           | 0.2985   | $0.289^{+0.019}_{-0.025}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.005    | $1.02^{+0.32}_{-0.31}$          | $z_*$                          | 1089.73  | $1089.85^{+0.86}_{-0.81}$       | $\sigma_8(2.33)$            | 0.3082   | $0.297^{+0.022}_{-0.029}$    |
| $c_{100}$                            | 0.99775  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                          | 146.04   | $145.9^{+4.2}_{-4.2}$           | $f_{2000}^{143}$            | 28.4     | $29^{+7}_{-7}$               |
| $c_{217}$                            | 1.00114  | $1.0010^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | 1.04142  | $1.0414^{+0.0012}_{-0.0012}$    | $f_{2000}^{217}$            | 105.61   | $106.3^{+4.6}_{-4.5}$        |
| $c_{TE}$                             | 0.9954   | $0.996^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 14.023   | $14.01^{+0.39}_{-0.39}$         | $f_{2000}^{143 \times 217}$ | 30.84    | $31^{+5}_{-5}$               |
| $c_{EE}$                             | 0.9902   | $0.990^{+0.011}_{-0.011}$       | $z_{\text{drag}}$              | 1059.25  | $1059.2^{+1.7}_{-1.7}$          | $\chi_{\text{small}}^2$     | 395.79   | $396.9 (\nu: 1.4)$           |
| $H_0$                                | 66.96    | $65.8^{+4.1}_{-4.3}$            | $r_{\text{drag}}$              | 148.78   | $148.7^{+4.4}_{-4.4}$           | $\chi_{\text{lowl}}^2$      | 23.66    | $23.9 (\nu: 1.2)$            |
| $\Omega_\Lambda$                     | 0.6888   | $0.672^{+0.036}_{-0.044}$       | $k_{\text{D}}$                 | 0.13956  | $0.1396^{+0.0031}_{-0.0030}$    | $\chi_{\text{CamSpec}}^2$   | 11498.0  | $11515.4 (\nu: 18.9)$        |
| $\Omega_{\text{m}}$                  | 0.3112   | $0.328^{+0.044}_{-0.036}$       | $100\theta_{\text{D}}$         | 0.16052  | $0.1606^{+0.0011}_{-0.0010}$    | $\chi_{\text{prior}}^2$     | 2.0      | $8.0 (\nu: 6.2)$             |
| $\Omega_{\text{m}} h^2$              | 0.1395   | $0.1413^{+0.0078}_{-0.0072}$    | $z_{\text{eq}}$                | 3404     | $3411^{+81}_{-79}$              | $\chi_{\text{CMB}}^2$       | 11917.5  | $11936.2 (\nu: 19.2)$        |
| $\Omega_\nu h^2$                     | 0.00001  | $< 0.00402$                     | $k_{\text{eq}}$                | 0.010283 | $0.01031^{+0.00026}_{-0.00025}$ |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11919.53$ ;  $\Delta\chi_{\text{eff}}^2 = -1.23$ ;  $\bar{\chi}_{\text{eff}}^2 = 11944.15$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 1.69$ ;  $R - 1 = 0.00883$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.79 ( $\Delta$  -0.11) commander\_dx12\_v3\_2\_29: 23.66 ( $\Delta$  0.66) CamSpec like\_10.7HM\_1400\_unified: 11498.05 ( $\Delta$  -1.60)



#### 8.4 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022166 | $0.02215^{+0.00045}_{-0.00044}$ | $\Omega_m h^3$                 | 0.0921   | $0.0926^{+0.0088}_{-0.0083}$    | $100\theta_{\text{eq}}$     | 0.8111   | $0.810^{+0.014}_{-0.014}$    |
| $\Omega_c h^2$                       | 0.1163   | $0.1175^{+0.0067}_{-0.0064}$    | $\sigma_8$                     | 0.8108   | $0.795^{+0.036}_{-0.042}$       | $100\theta_{\text{s,eq}}$   | 0.4484   | $0.4479^{+0.0073}_{-0.0073}$ |
| $100\theta_{\text{MC}}$              | 1.04128  | $1.04111^{+0.00093}_{-0.00093}$ | $S_8$                          | 0.8283   | $0.828^{+0.026}_{-0.025}$       | $H(0.15)$                   | 71.73    | $71.1^{+3.5}_{-3.7}$         |
| $\tau$                               | 0.0509   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.5}$      | 0.4537   | $0.453^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.15)$        | 651.8    | $659^{+36}_{-35}$            |
| $\Sigma m_\nu [\text{eV}]$           | 0.000    | $< 0.288$                       | $\sigma_8 \Omega_m^{0.25}$     | 0.6065   | $0.600^{+0.019}_{-0.020}$       | $H(0.38)$                   | 81.72    | $81.4^{+3.4}_{-3.4}$         |
| $N_{\text{eff}}$                     | 2.823    | $2.87^{+0.45}_{-0.43}$          | $\sigma_8/h^{0.5}$             | 0.9942   | $0.980^{+0.028}_{-0.034}$       | $D_{\text{M}}(0.38)$        | 1554     | $1567^{+82}_{-74}$           |
| $\ln(10^{10} A_s)$                   | 3.0266   | $3.034^{+0.037}_{-0.035}$       | $r_{\text{drag}} h$            | 99.40    | $98.0^{+3.7}_{-4.3}$            | $H(0.51)$                   | 88.36    | $88.1^{+3.4}_{-3.3}$         |
| $n_s$                                | 0.9585   | $0.958^{+0.018}_{-0.018}$       | $\langle d^2 \rangle^{1/2}$    | 2.4498   | $2.447^{+0.050}_{-0.050}$       | $D_{\text{M}}(0.51)$        | 2013     | $2028^{+100}_{-91}$          |
| $y_{\text{cal}}$                     | 1.0005   | $1.0006^{+0.0050}_{-0.0053}$    | $z_{\text{re}}$                | 7.28     | $7.5^{+1.6}_{-1.6}$             | $H(0.61)$                   | 93.91    | $93.8^{+3.4}_{-3.3}$         |
| $A_{100}^{\text{PS}}$                | 226.9    | $236^{+50}_{-50}$               | $10^9 A_s$                     | 2.063    | $2.077^{+0.079}_{-0.073}$       | $D_{\text{M}}(0.61)$        | 2342     | $2358^{+110}_{-100}$         |
| $A_{143}^{\text{PS}}$                | 45.0     | $37^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | 1.8630   | $1.868^{+0.039}_{-0.038}$       | $H(2.33)$                   | 232.9    | $234.3^{+6.1}_{-6.0}$        |
| $A_{217}^{\text{PS}}$                | 105.5    | $103^{+30}_{-30}$               | $D_{40}$                       | 1234.8   | $1237^{+31}_{-30}$              | $D_{\text{M}}(2.33)$        | 5848     | $5854^{+200}_{-200}$         |
| $A_{217}^{\text{CIB}}$               | 41.1     | $39^{+10}_{-10}$                | $D_{220}$                      | 5720     | $5719^{+76}_{-82}$              | $f\sigma_8(0.15)$           | 0.4574   | $0.457^{+0.013}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | 6.43     | $< 7.46$                        | $D_{810}$                      | 2532.9   | $2534^{+28}_{-29}$              | $\sigma_8(0.15)$            | 0.7489   | $0.733^{+0.035}_{-0.042}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.713    | $0.67^{+0.26}_{-0.26}$          | $D_{1420}$                     | 817.6    | $817^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4752   | $0.472^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.83     | —                               | $D_{2000}$                     | 231.86   | $231.2^{+4.1}_{-4.2}$           | $\sigma_8(0.38)$            | 0.6635   | $0.649^{+0.033}_{-0.040}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.66     | —                               | $n_{\text{s},0.002}$           | 0.9585   | $0.958^{+0.018}_{-0.018}$       | $f\sigma_8(0.51)$           | 0.4735   | $0.469^{+0.015}_{-0.015}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $Y_{\text{P}}$                 | 0.2423   | $0.2429^{+0.0061}_{-0.0061}$    | $\sigma_8(0.51)$            | 0.6207   | $0.607^{+0.032}_{-0.038}$    |
| $A_{100}^{\text{dust}}$              | 1.006    | $1.00^{+0.39}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.2436   | $0.2442^{+0.0062}_{-0.0062}$    | $f\sigma_8(0.61)$           | 0.4683   | $0.463^{+0.015}_{-0.017}$    |
| $A_{143}^{\text{dust}}$              | 0.977    | $0.95^{+0.34}_{-0.34}$          | $10^5 \text{D}/\text{H}$       | 2.546    | $2.57^{+0.11}_{-0.11}$          | $\sigma_8(0.61)$            | 0.5905   | $0.577^{+0.031}_{-0.037}$    |
| $A_{217}^{\text{dust}}$              | 0.982    | $0.98^{+0.20}_{-0.21}$          | $\text{Age}/\text{Gyr}$        | 14.000   | $14.01^{+0.48}_{-0.47}$         | $f\sigma_8(2.33)$           | 0.2967   | $0.291^{+0.015}_{-0.018}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.005    | $1.02^{+0.31}_{-0.32}$          | $z_*$                          | 1089.63  | $1089.81^{+0.82}_{-0.79}$       | $\sigma_8(2.33)$            | 0.3063   | $0.299^{+0.018}_{-0.020}$    |
| $c_{100}$                            | 0.99776  | $0.9976^{+0.0021}_{-0.0021}$    | $r_*$                          | 146.71   | $146.2^{+4.2}_{-4.1}$           | $f_{2000}^{143}$            | 28.1     | $28^{+7}_{-7}$               |
| $c_{217}$                            | 1.00115  | $1.0010^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | 1.04160  | $1.0415^{+0.0012}_{-0.0012}$    | $f_{2000}^{217}$            | 105.39   | $106.0^{+4.6}_{-4.5}$        |
| $c_{TE}$                             | 0.9951   | $0.9957^{+0.010}_{-0.0099}$     | $D_{\text{M}}(z_*)/\text{Gpc}$ | 14.085   | $14.04^{+0.39}_{-0.38}$         | $f_{2000}^{143 \times 217}$ | 30.63    | $31^{+5}_{-5}$               |
| $c_{EE}$                             | 0.9894   | $0.990^{+0.011}_{-0.011}$       | $z_{\text{drag}}$              | 1059.02  | $1059.1^{+1.6}_{-1.6}$          | $\chi_{\text{lensing}}^2$   | 8.57     | $9.19 (\nu: 0.4)$            |
| $H_0$                                | 66.50    | $65.8^{+3.6}_{-4.0}$            | $r_{\text{drag}}$              | 149.47   | $149.0^{+4.3}_{-4.3}$           | $\chi_{\text{small}}^2$     | 395.68   | $397.0 (\nu: 1.5)$           |
| $\Omega_\Lambda$                     | 0.6869   | $0.674^{+0.031}_{-0.037}$       | $k_{\text{D}}$                 | 0.13909  | $0.1395^{+0.0031}_{-0.0030}$    | $\chi_{\text{lowl}}^2$      | 24.10    | $24.2 (\nu: 1.1)$            |
| $\Omega_{\text{m}}$                  | 0.3131   | $0.326^{+0.037}_{-0.031}$       | $100\theta_{\text{D}}$         | 0.16036  | $0.1605^{+0.0010}_{-0.0010}$    | $\chi_{\text{CamSpec}}^2$   | 11497.8  | $11514.2 (\nu: 16.6)$        |
| $\Omega_{\text{m}} h^2$              | 0.1385   | $0.1407^{+0.0075}_{-0.0070}$    | $z_{\text{eq}}$                | 3412     | $3417^{+78}_{-75}$              | $\chi_{\text{prior}}^2$     | 2.1      | $8.0 (\nu: 6.1)$             |
| $\Omega_\nu h^2$                     | 0.00000  | $< 0.00293$                     | $k_{\text{eq}}$                | 0.010255 | $0.01030^{+0.00024}_{-0.00023}$ | $\chi_{\text{CMB}}^2$       | 11926.1  | $11944.6 (\nu: 18.9)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11928.16$ ;  $\Delta\chi_{\text{eff}}^2 = -1.50$ ;  $\bar{\chi}_{\text{eff}}^2 = 11952.59$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 1.14$ ;  $R - 1 = 0.01252$

$\chi_{\text{eff}}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consect8: 8.57 ( $\Delta$  -0.26) small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.68 ( $\Delta$  -0.19) commander\_dx12\_v3\_2\_29: 24.10 ( $\Delta$  0.88) CamSpec like\_10.7HM\_1400.unified: 11497.75 ( $\Delta$  -1.90)



## 8.5 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022176 | $0.02224^{+0.00046}_{-0.00047}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4540   | $0.450^{+0.019}_{-0.020}$       | $H(0.38)$                   | 83.24    | $83.2^{+3.0}_{-3.1}$      |
| $\Omega_c h^2$              | 0.1195   | $0.1196^{+0.0081}_{-0.0078}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6101   | $0.603^{+0.024}_{-0.026}$       | $D_M(0.38)$                 | 1523     | $1525^{+62}_{-58}$        |
| $100\theta_{MC}$            | 1.04098  | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9945   | $0.982^{+0.034}_{-0.038}$       | $H(0.51)$                   | 89.91    | $90.0^{+3.2}_{-3.2}$      |
| $\tau$                      | 0.0520   | $0.054^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 100.22   | $99.9^{+2.0}_{-2.1}$            | $D_M(0.51)$                 | 1974     | $1975^{+79}_{-74}$        |
| $\Sigma m_\nu$ [eV]         | 0.000    | $< 0.177$                       | $\langle d^2 \rangle^{1/2}$ | 2.438    | $2.422^{+0.063}_{-0.066}$       | $H(0.61)$                   | 95.49    | $95.6^{+3.3}_{-3.3}$      |
| $N_{eff}$                   | 3.051    | $3.09^{+0.49}_{-0.48}$          | $z_{re}$                    | 7.47     | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2297     | $2299^{+90}_{-85}$        |
| $\ln(10^{10} A_s)$          | 3.0359   | $3.040^{+0.039}_{-0.040}$       | $10^9 A_s$                  | 2.082    | $2.090^{+0.083}_{-0.081}$       | $H(2.33)$                   | 235.7    | $236.3^{+7.1}_{-7.1}$     |
| $n_s$                       | 0.9659   | $0.969^{+0.018}_{-0.018}$       | $10^9 A_s e^{-2\tau}$       | 1.8764   | $1.877^{+0.042}_{-0.045}$       | $D_M(2.33)$                 | 5755     | $5751^{+200}_{-190}$      |
| $y_{cal}$                   | 1.00023  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{40}$                    | 1224.3   | $1221^{+30}_{-30}$              | $f\sigma_8(0.15)$           | 0.4582   | $0.455^{+0.019}_{-0.019}$ |
| $A_{100}^{PS}$              | 243      | $243^{+50}_{-50}$               | $D_{220}$                   | 5705     | $5709^{+80}_{-79}$              | $\sigma_8(0.15)$            | 0.7581   | $0.748^{+0.030}_{-0.035}$ |
| $A_{143}^{PS}$              | 39.7     | $41^{+20}_{-20}$                | $D_{810}$                   | 2531.3   | $2534^{+28}_{-28}$              | $f\sigma_8(0.38)$           | 0.4777   | $0.473^{+0.018}_{-0.019}$ |
| $A_{217}^{PS}$              | 98.0     | $101^{+30}_{-30}$               | $D_{1420}$                  | 813.6    | $815^{+11}_{-11}$               | $\sigma_8(0.38)$            | 0.6723   | $0.663^{+0.027}_{-0.031}$ |
| $A_{217}^{CIB}$             | 45.0     | $41^{+20}_{-10}$                | $D_{2000}$                  | 229.42   | $229.7^{+4.7}_{-4.5}$           | $f\sigma_8(0.51)$           | 0.4768   | $0.472^{+0.018}_{-0.019}$ |
| $A_{143}^{tSZ}$             | 5.21     | $< 7.38$                        | $n_{s,0.002}$               | 0.9659   | $0.969^{+0.018}_{-0.018}$       | $\sigma_8(0.51)$            | 0.6293   | $0.620^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{PS}$   | 0.582    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.2454   | $0.2458^{+0.0065}_{-0.0066}$    | $f\sigma_8(0.61)$           | 0.4722   | $0.467^{+0.017}_{-0.019}$ |
| $r_{143 \times 217}^{CIB}$  | 0.71     | —                               | $Y_P^{BBN}$                 | 0.2467   | $0.2472^{+0.0065}_{-0.0067}$    | $\sigma_8(0.61)$            | 0.5988   | $0.590^{+0.024}_{-0.028}$ |
| $\xi^{tSZ \times CIB}$      | 0.09     | —                               | $10^5 D/H$                  | 2.624    | $2.62^{+0.14}_{-0.14}$          | $f\sigma_8(2.33)$           | 0.3012   | $0.298^{+0.012}_{-0.013}$ |
| $A^{kSZ}$                   | 2.3      | —                               | Age/Gyr                     | 13.779   | $13.77^{+0.47}_{-0.45}$         | $\sigma_8(2.33)$            | 0.3111   | $0.307^{+0.013}_{-0.014}$ |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | 1090.12  | $1090.1^{+1.0}_{-0.99}$         | $f_{2000}^{143}$            | 31.1     | $31^{+7}_{-7}$            |
| $A_{143}^{dust}$            | 0.979    | $0.98^{+0.34}_{-0.35}$          | $r_*$                       | 144.70   | $144.5^{+4.7}_{-4.5}$           | $f_{2000}^{217}$            | 107.59   | $107.6^{+4.8}_{-4.9}$     |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | 1.04115  | $1.0412^{+0.0014}_{-0.0014}$    | $f_{2000}^{143 \times 217}$ | 33.1     | $33^{+5}_{-5}$            |
| $A_{143 \times 217}^{dust}$ | 1.023    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.898   | $13.88^{+0.44}_{-0.42}$         | $\chi_{simall}^2$           | 395.81   | $397.0 (\nu: 1.5)$        |
| $c_{100}$                   | 0.99757  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1059.44  | $1059.6^{+1.7}_{-1.8}$          | $\chi_{lowl}^2$             | 23.10    | $22.8 (\nu: 0.8)$         |
| $c_{217}$                   | 1.00164  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | 147.43   | $147.2^{+4.9}_{-4.6}$           | $\chi_{CamSpec}^2$          | 7050.2   | $7064.9 (\nu: 17.1)$      |
| $H_0$                       | 67.98    | $67.9^{+2.9}_{-2.9}$            | $k_D$                       | 0.14033  | $0.1405^{+0.0034}_{-0.0035}$    | $\chi_{6DF}^2$              | 0.003    | $0.060 (\nu: 0.0)$        |
| $\Omega_\Lambda$            | 0.6935   | $0.691^{+0.016}_{-0.017}$       | $100\theta_D$               | 0.16108  | $0.1611^{+0.0012}_{-0.0012}$    | $\chi_{MGS}^2$              | 1.54     | $1.44 (\nu: 0.2)$         |
| $\Omega_m$                  | 0.3065   | $0.309^{+0.017}_{-0.016}$       | $z_{eq}$                    | 3382     | $3371^{+67}_{-68}$              | $\chi_{DR12BAO}^2$          | 3.66     | $4.7 (\nu: 1.4)$          |
| $\Omega_m h^2$              | 0.1416   | $0.1425^{+0.0085}_{-0.0083}$    | $k_{eq}$                    | 0.010327 | $0.01031^{+0.00030}_{-0.00030}$ | $\chi_{prior}^2$            | 2.4      | $7.7 (\nu: 6.1)$          |
| $\Omega_\nu h^2$            | 0.00000  | $< 0.00188$                     | $100\theta_{eq}$            | 0.8163   | $0.819^{+0.013}_{-0.012}$       | $\chi_{BAO}^2$              | 5.20     | $6.2 (\nu: 1.0)$          |
| $\Omega_m h^3$              | 0.0963   | $0.0968^{+0.0095}_{-0.0092}$    | $100\theta_{s,eq}$          | 0.4511   | $0.4523^{+0.0066}_{-0.0064}$    | $\chi_{CMB}^2$              | 7469.1   | $7484.7 (\nu: 16.3)$      |
| $\sigma_8$                  | 0.8200   | $0.809^{+0.032}_{-0.037}$       | $H(0.15)$                   | 73.21    | $73.2^{+2.9}_{-2.9}$            |                             |          |                           |
| $S_8$                       | 0.8289   | $0.821^{+0.035}_{-0.037}$       | $D_M(0.15)$                 | 638.1    | $639^{+27}_{-25}$               |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7476.70$ ;  $\bar{\chi}_{eff}^2 = 7498.64$ ;  $\Delta\bar{\chi}_{eff}^2 = 1.09$ ;  $R - 1 = 0.00711$

$\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.54 DR12BAO: 3.66 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.81 commander\_dx12\_v3.2.29: 23.10 CamSpec like\_10.7HM: 7050.23



## 8.6 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022227 | $0.02226^{+0.00045}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4538   | $0.449^{+0.019}_{-0.020}$       | $H(0.38)$                   | 83.49    | $83.4^{+3.0}_{-3.0}$      |
| $\Omega_c h^2$              | 0.1197   | $0.1197^{+0.0080}_{-0.0078}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6107   | $0.603^{+0.023}_{-0.026}$       | $D_M(0.38)$                 | 1518     | $1521^{+60}_{-56}$        |
| $100\theta_{MC}$            | 1.04101  | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9950   | $0.981^{+0.033}_{-0.038}$       | $H(0.51)$                   | 90.16    | $90.1^{+3.1}_{-3.1}$      |
| $\tau$                      | 0.0532   | $0.054^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 100.44   | $100.1^{+1.9}_{-1.9}$           | $D_M(0.51)$                 | 1967     | $1971^{+76}_{-71}$        |
| $\Sigma m_\nu$ [eV]         | 0.000    | $< 0.172$                       | $\langle d^2 \rangle^{1/2}$ | 2.435    | $2.420^{+0.061}_{-0.064}$       | $H(0.61)$                   | 95.74    | $95.7^{+3.2}_{-3.2}$      |
| $N_{eff}$                   | 3.079    | $3.10^{+0.49}_{-0.47}$          | $z_{re}$                    | 7.59     | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2290     | $2294^{+87}_{-82}$        |
| $\ln(10^{10} A_s)$          | 3.0394   | $3.040^{+0.039}_{-0.039}$       | $10^9 A_s$                  | 2.089    | $2.092^{+0.083}_{-0.081}$       | $H(2.33)$                   | 236.0    | $236.4^{+7.1}_{-7.0}$     |
| $n_s$                       | 0.9682   | $0.969^{+0.017}_{-0.018}$       | $10^9 A_s e^{-2\tau}$       | 1.8785   | $1.878^{+0.042}_{-0.044}$       | $D_M(2.33)$                 | 5741     | $5744^{+190}_{-190}$      |
| $y_{cal}$                   | 1.0004   | $1.0005^{+0.0050}_{-0.0050}$    | $D_{40}$                    | 1220.8   | $1220^{+31}_{-29}$              | $f\sigma_8(0.15)$           | 0.4582   | $0.454^{+0.018}_{-0.019}$ |
| $A_{100}^{PS}$              | 238      | $243^{+50}_{-50}$               | $D_{220}$                   | 5704     | $5709^{+81}_{-79}$              | $\sigma_8(0.15)$            | 0.7601   | $0.748^{+0.030}_{-0.034}$ |
| $A_{143}^{PS}$              | 39.6     | $41^{+20}_{-20}$                | $D_{810}$                   | 2533.4   | $2534^{+28}_{-28}$              | $f\sigma_8(0.38)$           | 0.4781   | $0.473^{+0.018}_{-0.019}$ |
| $A_{217}^{PS}$              | 100.6    | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.6    | $815^{+11}_{-11}$               | $\sigma_8(0.38)$            | 0.6743   | $0.664^{+0.026}_{-0.031}$ |
| $A_{217}^{CIB}$             | 45.5     | $41^{+20}_{-10}$                | $D_{2000}$                  | 229.76   | $229.6^{+4.6}_{-4.5}$           | $f\sigma_8(0.51)$           | 0.4774   | $0.472^{+0.018}_{-0.019}$ |
| $A_{143}^{tSZ}$             | 6.22     | $< 7.31$                        | $n_{s,0.002}$               | 0.9682   | $0.969^{+0.017}_{-0.018}$       | $\sigma_8(0.51)$            | 0.6312   | $0.621^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{PS}$   | 0.571    | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | 0.2458   | $0.2460^{+0.0064}_{-0.0065}$    | $f\sigma_8(0.61)$           | 0.4729   | $0.468^{+0.017}_{-0.019}$ |
| $r_{143 \times 217}^{CIB}$  | 0.77     | —                               | $Y_P^{BBN}$                 | 0.2471   | $0.2474^{+0.0064}_{-0.0065}$    | $\sigma_8(0.61)$            | 0.6007   | $0.591^{+0.024}_{-0.028}$ |
| $\xi^{tSZ \times CIB}$      | 0.02     | —                               | $10^5 D/H$                  | 2.624    | $2.63^{+0.14}_{-0.13}$          | $f\sigma_8(2.33)$           | 0.3022   | $0.298^{+0.012}_{-0.013}$ |
| $A^{kSZ}$                   | 0.5      | —                               | Age/Gyr                     | 13.746   | $13.75^{+0.46}_{-0.44}$         | $\sigma_8(2.33)$            | 0.3123   | $0.308^{+0.013}_{-0.014}$ |
| $A_{100}^{dust}$            | 1.014    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1090.10  | $1090.1^{+1.0}_{-0.97}$         | $f_{2000}^{143}$            | 30.9     | $31^{+7}_{-7}$            |
| $A_{143}^{dust}$            | 0.990    | $0.98^{+0.34}_{-0.35}$          | $r_*$                       | 144.45   | $144.4^{+4.6}_{-4.4}$           | $f_{2000}^{217}$            | 107.43   | $107.6^{+4.8}_{-4.8}$     |
| $A_{217}^{dust}$            | 0.963    | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | 1.04115  | $1.0411^{+0.0014}_{-0.0014}$    | $f_{2000}^{143 \times 217}$ | 32.8     | $33^{+5}_{-5}$            |
| $A_{143 \times 217}^{dust}$ | 1.000    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.875   | $13.87^{+0.43}_{-0.41}$         | $\chi_{simall}^2$           | 395.87   | $397.0 (\nu: 1.5)$        |
| $c_{100}$                   | 0.99755  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1059.59  | $1059.7^{+1.7}_{-1.7}$          | $\chi_{lowl}^2$             | 22.77    | $22.7 (\nu: 0.7)$         |
| $c_{217}$                   | 1.00139  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | 147.17   | $147.1^{+4.8}_{-4.6}$           | $\chi_{CamSpec}^2$          | 7050.7   | $7065.1 (\nu: 16.9)$      |
| $H_0$                       | 68.25    | $68.1^{+2.8}_{-2.8}$            | $k_D$                       | 0.14055  | $0.1406^{+0.0034}_{-0.0034}$    | $\chi_{JLA}^2$              | 1034.80  | $1035.02 (\nu: 0.1)$      |
| $\Omega_\Lambda$            | 0.6952   | $0.692^{+0.015}_{-0.016}$       | $100\theta_D$               | 0.16111  | $0.1611^{+0.0012}_{-0.0012}$    | $\chi_{6DF}^2$              | 0.000    | $0.048 (\nu: 0.0)$        |
| $\Omega_m$                  | 0.3048   | $0.308^{+0.016}_{-0.015}$       | $z_{eq}$                    | 3377     | $3367^{+64}_{-64}$              | $\chi_{MGS}^2$              | 1.68     | $1.52 (\nu: 0.2)$         |
| $\Omega_m h^2$              | 0.1420   | $0.1426^{+0.0085}_{-0.0082}$    | $k_{eq}$                    | 0.010331 | $0.01031^{+0.00030}_{-0.00029}$ | $\chi_{DR12BAO}^2$          | 3.50     | $4.4 (\nu: 1.0)$          |
| $\Omega_\nu h^2$            | 0.00000  | $< 0.00183$                     | $100\theta_{eq}$            | 0.8174   | $0.819^{+0.012}_{-0.012}$       | $\chi_{prior}^2$            | 2.1      | $7.7 (\nu: 6.1)$          |
| $\Omega_m h^3$              | 0.0969   | $0.0971^{+0.0094}_{-0.0090}$    | $100\theta_{s,eq}$          | 0.4516   | $0.4527^{+0.0063}_{-0.0061}$    | $\chi_{BAO}^2$              | 5.18     | $6.0 (\nu: 0.6)$          |
| $\sigma_8$                  | 0.8220   | $0.809^{+0.032}_{-0.037}$       | $H(0.15)$                   | 73.47    | $73.3^{+2.8}_{-2.8}$            | $\chi_{CMB}^2$              | 7469.3   | $7484.8 (\nu: 16.3)$      |
| $S_8$                       | 0.8285   | $0.820^{+0.035}_{-0.036}$       | $D_M(0.15)$                 | 635.7    | $638^{+26}_{-24}$               |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 8511.44$ ;  $\bar{\chi}_{eff}^2 = 8533.53$ ;  $R - 1 = 0.00839$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.68 DR12BAO: 3.50 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 commander\_dx12\_v3.2.29: 22.77 CamSpec like\_10.7HM: 7050.67  
SN - JLA Pantheon18: 1034.80



## 8.7 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Aver15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022168 | $0.02221^{+0.00043}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4537   | $0.449^{+0.019}_{-0.020}$       | $H(0.38)$                   | 82.82    | $82.8^{+2.4}_{-2.4}$      |
| $\Omega_c h^2$              | 0.1184   | $0.1185^{+0.0064}_{-0.0062}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6092   | $0.602^{+0.022}_{-0.026}$       | $D_M(0.38)$                 | 1531.1   | $1532^{+49}_{-47}$        |
| $100\theta_{MC}$            | 1.04116  | $1.0411^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$          | 0.9949   | $0.981^{+0.033}_{-0.037}$       | $H(0.51)$                   | 89.47    | $89.5^{+2.5}_{-2.5}$      |
| $\tau$                      | 0.0531   | $0.054^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 100.10   | $99.8^{+2.0}_{-2.0}$            | $D_M(0.51)$                 | 1984     | $1985^{+62}_{-60}$        |
| $\Sigma m_\nu$ [eV]         | 0.001    | $< 0.167$                       | $\langle d^2 \rangle^{1/2}$ | 2.441    | $2.425^{+0.062}_{-0.065}$       | $H(0.61)$                   | 95.04    | $95.1^{+2.5}_{-2.5}$      |
| $N_{eff}$                   | 2.982    | $3.02^{+0.37}_{-0.36}$          | $z_{re}$                    | 7.56     | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2309     | $2310^{+71}_{-68}$        |
| $\ln(10^{10} A_s)$          | 3.0354   | $3.037^{+0.036}_{-0.037}$       | $10^9 A_s$                  | 2.081    | $2.084^{+0.077}_{-0.076}$       | $H(2.33)$                   | 234.8    | $235.3^{+5.5}_{-5.5}$     |
| $n_s$                       | 0.9643   | $0.966^{+0.014}_{-0.015}$       | $10^9 A_s e^{-2\tau}$       | 1.8713   | $1.873^{+0.036}_{-0.037}$       | $D_M(2.33)$                 | 5782     | $5777^{+150}_{-150}$      |
| $y_{cal}$                   | 1.00029  | $1.0005^{+0.0049}_{-0.0050}$    | $D_{40}$                    | 1226.0   | $1223^{+28}_{-29}$              | $f\sigma_8(0.15)$           | 0.4578   | $0.454^{+0.018}_{-0.019}$ |
| $A_{100}^{PS}$              | 238.2    | $241^{+50}_{-50}$               | $D_{220}$                   | 5705     | $5709^{+80}_{-79}$              | $\sigma_8(0.15)$            | 0.7561   | $0.745^{+0.028}_{-0.031}$ |
| $A_{143}^{PS}$              | 38.0     | $40^{+20}_{-20}$                | $D_{810}$                   | 2531.0   | $2533^{+28}_{-28}$              | $f\sigma_8(0.38)$           | 0.4770   | $0.472^{+0.017}_{-0.019}$ |
| $A_{217}^{PS}$              | 99.4     | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.7    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6705   | $0.661^{+0.025}_{-0.028}$ |
| $A_{217}^{CIB}$             | 44.4     | $41^{+20}_{-10}$                | $D_{2000}$                  | 230.15   | $230.1^{+4.2}_{-4.1}$           | $f\sigma_8(0.51)$           | 0.4760   | $0.471^{+0.016}_{-0.019}$ |
| $A_{143}^{tSZ}$             | 5.35     | $< 7.35$                        | $n_{s,0.002}$               | 0.9643   | $0.966^{+0.014}_{-0.015}$       | $\sigma_8(0.51)$            | 0.6275   | $0.619^{+0.024}_{-0.026}$ |
| $r_{143 \times 217}^{PS}$   | 0.573    | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | 0.2445   | $0.2449^{+0.0049}_{-0.0050}$    | $f\sigma_8(0.61)$           | 0.4713   | $0.466^{+0.016}_{-0.018}$ |
| $r_{143 \times 217}^{CIB}$  | 0.70     | —                               | $Y_P^{BBN}$                 | 0.2458   | $0.2463^{+0.0050}_{-0.0051}$    | $\sigma_8(0.61)$            | 0.5971   | $0.589^{+0.023}_{-0.025}$ |
| $\xi^{tSZ \times CIB}$      | 0.05     | —                               | $10^5 D/H$                  | 2.602    | $2.61^{+0.12}_{-0.11}$          | $f\sigma_8(2.33)$           | 0.3002   | $0.297^{+0.011}_{-0.011}$ |
| $A^{kSZ}$                   | 1.8      | —                               | Age/Gyr                     | 13.842   | $13.83^{+0.36}_{-0.35}$         | $\sigma_8(2.33)$            | 0.3102   | $0.306^{+0.012}_{-0.013}$ |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | 1089.97  | $1089.97^{+0.85}_{-0.84}$       | $f_{2000}^{143}$            | 30.3     | $30^{+7}_{-7}$            |
| $A_{143}^{dust}$            | 0.981    | $0.98^{+0.35}_{-0.35}$          | $r_*$                       | 145.33   | $145.1^{+3.7}_{-3.5}$           | $f_{2000}^{217}$            | 106.91   | $107.2^{+4.5}_{-4.5}$     |
| $A_{217}^{dust}$            | 0.956    | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | 1.04137  | $1.0413^{+0.0012}_{-0.0012}$    | $f_{2000}^{143 \times 217}$ | 32.24    | $33^{+5}_{-5}$            |
| $A_{143 \times 217}^{dust}$ | 1.003    | $1.03^{+0.32}_{-0.33}$          | $D_M(z_*)/\text{Gpc}$       | 13.956   | $13.94^{+0.34}_{-0.33}$         | $\chi_{simall}^2$           | 395.88   | $397.0 (\nu: 1.5)$        |
| $c_{100}$                   | 0.99744  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1059.28  | $1059.4^{+1.5}_{-1.5}$          | $\chi_{lowl}^2$             | 23.28    | $23.0 (\nu: 0.7)$         |
| $c_{217}$                   | 1.00128  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | 148.08   | $147.8^{+3.8}_{-3.6}$           | $\chi_{CamSpec}^2$          | 7050.0   | $7064.4 (\nu: 16.3)$      |
| $H_0$                       | 67.60    | $67.5^{+2.3}_{-2.3}$            | $k_D$                       | 0.13992  | $0.1401^{+0.0027}_{-0.0027}$    | $\chi_{Aver15}^2$           | 0.05     | $0.52 (\nu: 0.3)$         |
| $\Omega_\Lambda$            | 0.6924   | $0.690^{+0.016}_{-0.016}$       | $100\theta_D$               | 0.16089  | $0.16096^{+0.00098}_{-0.00097}$ | $\chi_{6DF}^2$              | 0.006    | $0.063 (\nu: 0.0)$        |
| $\Omega_m$                  | 0.3076   | $0.310^{+0.016}_{-0.016}$       | $z_{eq}$                    | 3388     | $3375^{+64}_{-65}$              | $\chi_{MGS}^2$              | 1.47     | $1.38 (\nu: 0.2)$         |
| $\Omega_m h^2$              | 0.1406   | $0.1414^{+0.0067}_{-0.0065}$    | $k_{eq}$                    | 0.010296 | $0.01028^{+0.00026}_{-0.00026}$ | $\chi_{DR12BAO}^2$          | 3.76     | $4.8 (\nu: 1.5)$          |
| $\Omega_\nu h^2$            | 0.00001  | $< 0.00176$                     | $100\theta_{eq}$            | 0.8154   | $0.818^{+0.013}_{-0.012}$       | $\chi_{prior}^2$            | 2.2      | $7.7 (\nu: 6.0)$          |
| $\Omega_m h^3$              | 0.0950   | $0.0955^{+0.0072}_{-0.0069}$    | $100\theta_{s,eq}$          | 0.4506   | $0.4519^{+0.0064}_{-0.0061}$    | $\chi_{BAO}^2$              | 5.23     | $6.2 (\nu: 1.0)$          |
| $\sigma_8$                  | 0.8180   | $0.806^{+0.031}_{-0.033}$       | $H(0.15)$                   | 72.82    | $72.8^{+2.3}_{-2.3}$            | $\chi_{CMB}^2$              | 7469.2   | $7484.4 (\nu: 15.7)$      |
| $S_8$                       | 0.8283   | $0.820^{+0.034}_{-0.037}$       | $D_M(0.15)$                 | 641.6    | $642^{+22}_{-21}$               |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7476.67$ ;  $\bar{\chi}_{eff}^2 = 7498.80$ ;  $R - 1 = 0.00899$

$\chi_{eff}^2$ : Abund - Yp\_Aver2015: 0.05 BAO - 6DF: 0.01 MGS: 1.47 DR12BAO: 3.76 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.88 commander\_dx12\_v3.2.29: 23.28 CamSpec like\_10.7HM: 7050.02



## 8.8 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022178 | $0.02220^{+0.00043}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6102   | $0.602^{+0.023}_{-0.024}$       | $H(0.51)$                   | 89.46    | $89.6^{+2.3}_{-2.3}$      |
| $\Omega_c h^2$              | 0.1185   | $0.1186^{+0.0058}_{-0.0057}$    | $\sigma_8/h^{0.5}$          | 0.9962   | $0.982^{+0.033}_{-0.037}$       | $D_M(0.51)$                 | 1985     | $1984^{+59}_{-56}$        |
| $100\theta_{MC}$            | 1.04111  | $1.04107^{+0.00098}_{-0.00099}$ | $r_{drag}h$                 | 99.99    | $99.8^{+2.0}_{-2.0}$            | $H(0.61)$                   | 95.03    | $95.2^{+2.4}_{-2.4}$      |
| $\tau$                      | 0.0530   | $0.053^{+0.016}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.445    | $2.425^{+0.062}_{-0.065}$       | $D_M(0.61)$                 | 2310     | $2309^{+67}_{-64}$        |
| $\Sigma m_\nu$ [eV]         | 0.002    | < 0.166                         | $z_{re}$                    | 7.55     | $7.6^{+1.6}_{-1.7}$             | $H(2.33)$                   | 234.9    | $235.4^{+5.1}_{-5.1}$     |
| $N_{eff}$                   | 2.983    | $3.03^{+0.33}_{-0.33}$          | $10^9 A_s$                  | 2.084    | $2.085^{+0.075}_{-0.075}$       | $D_M(2.33)$                 | 5782     | $5774^{+140}_{-140}$      |
| $\ln(10^{10} A_s)$          | 3.0367   | $3.037^{+0.036}_{-0.036}$       | $10^9 A_s e^{-2\tau}$       | 1.8742   | $1.873^{+0.034}_{-0.035}$       | $f\sigma_8(0.15)$           | 0.4588   | $0.454^{+0.017}_{-0.019}$ |
| $n_s$                       | 0.9642   | $0.967^{+0.014}_{-0.014}$       | $D_{40}$                    | 1227.8   | $1223^{+28}_{-28}$              | $\sigma_8(0.15)$            | 0.7568   | $0.746^{+0.028}_{-0.030}$ |
| $y_{cal}$                   | 1.00061  | $1.0005^{+0.0049}_{-0.0050}$    | $D_{220}$                   | 5712     | $5709^{+80}_{-78}$              | $f\sigma_8(0.38)$           | 0.4779   | $0.473^{+0.016}_{-0.018}$ |
| $A_{100}^{PS}$              | 233.9    | $242^{+50}_{-50}$               | $D_{810}$                   | 2534.3   | $2533^{+28}_{-28}$              | $\sigma_8(0.38)$            | 0.6710   | $0.661^{+0.025}_{-0.027}$ |
| $A_{143}^{PS}$              | 45.4     | $40^{+20}_{-20}$                | $D_{1420}$                  | 815.8    | $815^{+10}_{-10}$               | $f\sigma_8(0.51)$           | 0.4768   | $0.471^{+0.016}_{-0.018}$ |
| $A_{217}^{PS}$              | 103.4    | $101^{+30}_{-30}$               | $D_{2000}$                  | 230.50   | $230.0^{+4.0}_{-3.8}$           | $\sigma_8(0.51)$            | 0.6280   | $0.619^{+0.023}_{-0.025}$ |
| $A_{217}^{CIB}$             | 41.7     | $41^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9642   | $0.967^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | 0.4719   | $0.467^{+0.015}_{-0.018}$ |
| $A_{143}^{tSZ}$             | 5.45     | < 7.33                          | $Y_P$                       | 0.24448  | $0.2450^{+0.0045}_{-0.0046}$    | $\sigma_8(0.61)$            | 0.5975   | $0.589^{+0.022}_{-0.024}$ |
| $r_{143 \times 217}^{PS}$   | 0.695    | $0.65^{+0.26}_{-0.26}$          | $Y_P^{BBN}$                 | 0.24580  | $0.2464^{+0.0045}_{-0.0046}$    | $f\sigma_8(2.33)$           | 0.3004   | $0.297^{+0.011}_{-0.011}$ |
| $r_{143 \times 217}^{CIB}$  | 0.76     | —                               | $10^5 D/H$                  | 2.600    | $2.610^{+0.098}_{-0.097}$       | $\sigma_8(2.33)$            | 0.3103   | $0.306^{+0.012}_{-0.012}$ |
| $\xi^{tSZ \times CIB}$      | 0.63     | —                               | Age/Gyr                     | 13.842   | $13.82^{+0.34}_{-0.33}$         | $f_{2000}^{143}$            | 29.9     | $30^{+6}_{-6}$            |
| $A^{kSZ}$                   | 2.1      | —                               | $z_*$                       | 1089.97  | $1089.99^{+0.73}_{-0.73}$       | $f_{2000}^{217}$            | 106.81   | $107.3^{+4.3}_{-4.3}$     |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.39}_{-0.38}$          | $r_*$                       | 145.28   | $145.0^{+3.3}_{-3.2}$           | $f_{2000}^{143 \times 217}$ | 32.23    | $33^{+5}_{-5}$            |
| $A_{143}^{dust}$            | 0.984    | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$               | 1.04132  | $1.0413^{+0.0011}_{-0.0011}$    | $\chi_{small}^2$            | 395.86   | $397.0 (\nu: 1.4)$        |
| $A_{217}^{dust}$            | 0.975    | $0.97^{+0.21}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.952   | $13.93^{+0.31}_{-0.30}$         | $\chi_{lowl}^2$             | 23.35    | $23.0 (\nu: 0.7)$         |
| $A_{143 \times 217}^{dust}$ | 1.017    | $1.03^{+0.32}_{-0.33}$          | $z_{drag}$                  | 1059.32  | $1059.4^{+1.4}_{-1.4}$          | $\chi_{CamSpec}^2$          | 7050.2   | $7064.2 (\nu: 15.9)$      |
| $c_{100}$                   | 0.99769  | $0.9975^{+0.0021}_{-0.0021}$    | $r_{drag}$                  | 148.02   | $147.8^{+3.5}_{-3.3}$           | $\chi_{Aver15}^2$           | 0.05     | $0.47 (\nu: 0.2)$         |
| $c_{217}$                   | 1.00127  | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | 0.13998  | $0.1401^{+0.0025}_{-0.0026}$    | $\chi_{Cooke17}^2$          | 0.04     | $0.29 (\nu: 0.1)$         |
| $H_0$                       | 67.55    | $67.6^{+2.3}_{-2.2}$            | $100\theta_D$               | 0.16086  | $0.16098^{+0.00082}_{-0.00083}$ | $\chi_{6DF}^2$              | 0.010    | $0.063 (\nu: 0.0)$        |
| $\Omega_\Lambda$            | 0.6916   | $0.690^{+0.016}_{-0.016}$       | $z_{eq}$                    | 3391     | $3375^{+64}_{-65}$              | $\chi_{MGS}^2$              | 1.41     | $1.39 (\nu: 0.2)$         |
| $\Omega_m$                  | 0.3084   | $0.310^{+0.016}_{-0.016}$       | $k_{eq}$                    | 0.010306 | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{DR12BAO}^2$          | 3.89     | $4.8 (\nu: 1.5)$          |
| $\Omega_m h^2$              | 0.1407   | $0.1415^{+0.0061}_{-0.0061}$    | $100\theta_{eq}$            | 0.8148   | $0.818^{+0.012}_{-0.012}$       | $\chi_{prior}^2$            | 2.0      | $7.7 (\nu: 5.9)$          |
| $\Omega_\nu h^2$            | 0.00002  | < 0.00176                       | $100\theta_{s,eq}$          | 0.4503   | $0.4519^{+0.0064}_{-0.0060}$    | $\chi_{BAO}^2$              | 5.30     | $6.2 (\nu: 1.0)$          |
| $\Omega_m h^3$              | 0.0951   | $0.0956^{+0.0067}_{-0.0065}$    | $H(0.15)$                   | 72.78    | $72.8^{+2.2}_{-2.2}$            | $\chi_{CMB}^2$              | 7469.4   | $7484.2 (\nu: 15.3)$      |
| $\sigma_8$                  | 0.8188   | $0.807^{+0.030}_{-0.033}$       | $D_M(0.15)$                 | 642.0    | $642^{+21}_{-20}$               | $\chi_{Abund}^2$            | 0.09     | $0.76 (\nu: 0.4)$         |
| $S_8$                       | 0.8302   | $0.820^{+0.034}_{-0.036}$       | $H(0.38)$                   | 82.80    | $82.9^{+2.2}_{-2.3}$            |                             |          |                           |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4547   | $0.449^{+0.019}_{-0.020}$       | $D_M(0.38)$                 | 1531.9   | $1531^{+47}_{-45}$              |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7476.77$ ;  $\bar{\chi}_{eff}^2 = 7498.82$ ;  $R - 1 = 0.00839$

$\chi_{eff}^2$ : Abund - Yp\_Aver2015: 0.05 D\_Cooke2017: 0.04 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.88 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.86 commander\_dx12\_v3\_2\_29: 23.35 CamSpec like\_10.7HM: 7050.16



## 8.9 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02227^{+0.00044}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.019}_{-0.020}$       | $H(0.38)$                   | $83.4^{+3.0}_{-2.9}$      |
| $\Omega_c h^2$                       | $0.1197^{+0.0080}_{-0.0077}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.023}_{-0.026}$       | $D_M(0.38)$                 | $1521^{+60}_{-56}$        |
| $100\theta_{MC}$                     | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | $0.982^{+0.033}_{-0.038}$       | $H(0.51)$                   | $90.1^{+3.1}_{-3.1}$      |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$         | $100.1^{+1.9}_{-1.9}$           | $D_M(0.51)$                 | $1971^{+76}_{-71}$        |
| $\Sigma m_\nu [\text{eV}]$           | $< 0.174$                       | $\langle d^2 \rangle^{1/2}$ | $2.423^{+0.060}_{-0.063}$       | $H(0.61)$                   | $95.7^{+3.2}_{-3.2}$      |
| $N_{\text{eff}}$                     | $3.10^{+0.48}_{-0.46}$          | $z_{\text{re}}$             | $< 8.99$                        | $D_M(0.61)$                 | $2294^{+87}_{-81}$        |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.037}_{-0.033}$       | $10^9 A_s$                  | $2.098^{+0.074}_{-0.071}$       | $H(2.33)$                   | $236.4^{+7.0}_{-7.0}$     |
| $n_s$                                | $0.970^{+0.017}_{-0.017}$       | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.041}_{-0.044}$       | $D_M(2.33)$                 | $5742^{+190}_{-180}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0050}$    | $D_{40}$                    | $1220^{+31}_{-30}$              | $f\sigma_8(0.15)$           | $0.455^{+0.018}_{-0.019}$ |
| $A_{100}^{\text{PS}}$                | $243^{+50}_{-50}$               | $D_{220}$                   | $5709^{+81}_{-78}$              | $\sigma_8(0.15)$            | $0.749^{+0.029}_{-0.034}$ |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{810}$                   | $2534^{+28}_{-28}$              | $f\sigma_8(0.38)$           | $0.474^{+0.018}_{-0.019}$ |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-11}$               | $\sigma_8(0.38)$            | $0.665^{+0.026}_{-0.030}$ |
| $A_{217}^{\text{CIB}}$               | $41^{+20}_{-10}$                | $D_{2000}$                  | $229.6^{+4.6}_{-4.5}$           | $f\sigma_8(0.51)$           | $0.473^{+0.017}_{-0.019}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.30$                        | $n_{s,0.002}$               | $0.970^{+0.017}_{-0.017}$       | $\sigma_8(0.51)$            | $0.622^{+0.025}_{-0.029}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.26}_{-0.25}$          | $Y_P$                       | $0.2461^{+0.0063}_{-0.0064}$    | $f\sigma_8(0.61)$           | $0.468^{+0.017}_{-0.018}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P^{\text{BBN}}$          | $0.2474^{+0.0064}_{-0.0064}$    | $\sigma_8(0.61)$            | $0.592^{+0.024}_{-0.027}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$    | $2.63^{+0.14}_{-0.13}$          | $f\sigma_8(2.33)$           | $0.299^{+0.011}_{-0.012}$ |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$     | $13.75^{+0.46}_{-0.44}$         | $\sigma_8(2.33)$            | $0.308^{+0.012}_{-0.014}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.1^{+1.0}_{-0.97}$         | $f_{2000}^{143}$            | $31^{+7}_{-7}$            |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.35}$          | $r_*$                       | $144.4^{+4.6}_{-4.4}$           | $f_{2000}^{217}$            | $107.6^{+4.8}_{-4.8}$     |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | $1.0411^{+0.0014}_{-0.0014}$    | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.87^{+0.43}_{-0.41}$         | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.6)$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.7^{+1.7}_{-1.8}$          | $\chi_{\text{lowl}}^2$      | $22.7 (\nu: 0.7)$         |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $147.1^{+4.7}_{-4.6}$           | $\chi_{\text{CamSpec}}^2$   | $7064.9 (\nu: 16.7)$      |
| $H_0$                                | $68.1^{+2.7}_{-2.8}$            | $k_D$                       | $0.1406^{+0.0033}_{-0.0034}$    | $\chi_{\text{JLA}}^2$       | $1035.02 (\nu: 0.1)$      |
| $\Omega_\Lambda$                     | $0.692^{+0.015}_{-0.016}$       | $100\theta_D$               | $0.1611^{+0.0012}_{-0.0012}$    | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$        |
| $\Omega_m$                           | $0.308^{+0.016}_{-0.015}$       | $z_{\text{eq}}$             | $3366^{+65}_{-64}$              | $\chi_{\text{MGS}}^2$       | $1.54 (\nu: 0.2)$         |
| $\Omega_m h^2$                       | $0.1426^{+0.0084}_{-0.0082}$    | $k_{\text{eq}}$             | $0.01031^{+0.00030}_{-0.00030}$ | $\chi_{\text{DR12BAO}}^2$   | $4.4 (\nu: 0.9)$          |
| $\Omega_\nu h^2$                     | $< 0.00185$                     | $100\theta_{\text{eq}}$     | $0.820^{+0.012}_{-0.012}$       | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 6.1)$          |
| $\Omega_m h^3$                       | $0.0972^{+0.0094}_{-0.0089}$    | $100\theta_{s,\text{eq}}$   | $0.4528^{+0.0063}_{-0.0061}$    | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.6)$          |
| $\sigma_8$                           | $0.810^{+0.031}_{-0.036}$       | $H(0.15)$                   | $73.3^{+2.8}_{-2.8}$            | $\chi_{\text{CMB}}^2$       | $7484.6 (\nu: 15.9)$      |
| $S_8$                                | $0.821^{+0.034}_{-0.037}$       | $D_M(0.15)$                 | $637^{+26}_{-24}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 8533.27; R - 1 = 0.00802$$



## 8.10 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.022242 | $0.02230^{+0.00038}_{-0.00038}$ | $\sigma_8$                  | 0.8138   | $0.806^{+0.028}_{-0.032}$       | $H(0.15)$                   | 72.47    | $72.7^{+2.6}_{-2.5}$      |
| $\Omega_c h^2$                       | 0.1169   | $0.1181^{+0.0068}_{-0.0065}$    | $S_8$                       | 0.8240   | $0.819^{+0.029}_{-0.030}$       | $D_M(0.15)$                 | 644.7    | $643^{+24}_{-23}$         |
| $100\theta_{MC}$                     | 1.04122  | $1.04106^{+0.00095}_{-0.00091}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4513   | $0.449^{+0.016}_{-0.016}$       | $H(0.38)$                   | 82.42    | $82.7^{+2.7}_{-2.6}$      |
| $\tau$                               | 0.0531   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6060   | $0.601^{+0.020}_{-0.022}$       | $D_M(0.38)$                 | 1539     | $1534^{+54}_{-53}$        |
| $\Sigma m_\nu$ [eV]                  | 0.002    | $< 0.155$                       | $\sigma_8/h^{0.5}$          | 0.9922   | $0.981^{+0.028}_{-0.031}$       | $H(0.51)$                   | 89.04    | $89.4^{+2.8}_{-2.7}$      |
| $N_{\text{eff}}$                     | 2.904    | $2.99^{+0.42}_{-0.40}$          | $r_{\text{drag}} h$         | 100.10   | $99.8^{+1.9}_{-1.9}$            | $D_M(0.51)$                 | 1994     | $1988^{+68}_{-67}$        |
| $\ln(10^{10} A_s)$                   | 3.0327   | $3.036^{+0.038}_{-0.037}$       | $\langle d^2 \rangle^{1/2}$ | 2.439    | $2.426^{+0.055}_{-0.057}$       | $H(0.61)$                   | 94.58    | $95.0^{+2.9}_{-2.8}$      |
| $n_s$                                | 0.9633   | $0.966^{+0.015}_{-0.015}$       | $z_{\text{re}}$             | 7.51     | $7.5^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2320     | $2313^{+77}_{-76}$        |
| $y_{\text{cal}}$                     | 1.00041  | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | 2.075    | $2.082^{+0.080}_{-0.075}$       | $H(2.33)$                   | 233.6    | $235.1^{+6.1}_{-5.8}$     |
| $A_{100}^{\text{PS}}$                | 226.8    | $238^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8662   | $1.872^{+0.038}_{-0.039}$       | $D_M(2.33)$                 | 5810     | $5784^{+170}_{-170}$      |
| $A_{143}^{\text{PS}}$                | 47.3     | $38^{+20}_{-20}$                | $D_{40}$                    | 1227.0   | $1226^{+28}_{-28}$              | $f\sigma_8(0.15)$           | 0.4555   | $0.453^{+0.015}_{-0.016}$ |
| $A_{217}^{\text{PS}}$                | 105.8    | $102^{+30}_{-30}$               | $D_{220}$                   | 5716     | $5721^{+77}_{-76}$              | $\sigma_8(0.15)$            | 0.7522   | $0.745^{+0.026}_{-0.030}$ |
| $A_{217}^{\text{CIB}}$               | 40.9     | $39^{+10}_{-10}$                | $D_{810}$                   | 2533.4   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4746   | $0.472^{+0.015}_{-0.016}$ |
| $A_{143}^{\text{tSZ}}$               | 6.33     | $< 7.51$                        | $D_{1420}$                  | 817.5    | $816.4^{+9.7}_{-9.9}$           | $\sigma_8(0.38)$            | 0.6670   | $0.660^{+0.024}_{-0.027}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.725    | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | 231.58   | $230.7^{+4.1}_{-4.1}$           | $f\sigma_8(0.51)$           | 0.4736   | $0.471^{+0.015}_{-0.016}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.85     | —                               | $n_{s,0.002}$               | 0.9633   | $0.966^{+0.015}_{-0.015}$       | $\sigma_8(0.51)$            | 0.6243   | $0.618^{+0.022}_{-0.025}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.76     | —                               | $Y_{\text{P}}$              | 0.2434   | $0.2446^{+0.0056}_{-0.0056}$    | $f\sigma_8(0.61)$           | 0.4689   | $0.466^{+0.015}_{-0.016}$ |
| $A^{\text{kSZ}}$                     | 0.2      | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2447   | $0.2459^{+0.0056}_{-0.0056}$    | $\sigma_8(0.61)$            | 0.5941   | $0.588^{+0.021}_{-0.024}$ |
| $A_{100}^{\text{dust}}$              | 1.019    | $1.01^{+0.39}_{-0.38}$          | $10^5 D/H$                  | 2.560    | $2.58^{+0.11}_{-0.11}$          | $f\sigma_8(2.33)$           | 0.2987   | $0.297^{+0.011}_{-0.011}$ |
| $A_{143}^{\text{dust}}$              | 0.984    | $0.96^{+0.35}_{-0.35}$          | Age/Gyr                     | 13.910   | $13.85^{+0.40}_{-0.40}$         | $\sigma_8(2.33)$            | 0.3086   | $0.306^{+0.012}_{-0.013}$ |
| $A_{217}^{\text{dust}}$              | 0.988    | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | 1089.67  | $1089.79^{+0.81}_{-0.81}$       | $f_{2000}^{143}$            | 28.5     | $29^{+7}_{-6}$            |
| $A_{143 \times 217}^{\text{dust}}$   | 1.012    | $1.02^{+0.32}_{-0.31}$          | $r_*$                       | 146.06   | $145.3^{+3.9}_{-3.9}$           | $f_{2000}^{217}$            | 105.56   | $106.5^{+4.5}_{-4.4}$     |
| $c_{100}$                            | 0.99774  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04148  | $1.0413^{+0.0012}_{-0.0011}$    | $f_{2000}^{143 \times 217}$ | 30.91    | $32^{+5}_{-5}$            |
| $c_{217}$                            | 1.00116  | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 14.024   | $13.95^{+0.36}_{-0.36}$         | $\chi_{\text{small}}^2$     | 395.84   | $396.9 (\nu: 1.5)$        |
| $c_{TE}$                             | 0.9957   | $0.997^{+0.010}_{-0.0098}$      | $z_{\text{drag}}$           | 1059.28  | $1059.6^{+1.5}_{-1.5}$          | $\chi_{\text{lowl}}^2$      | 23.33    | $23.1 (\nu: 0.7)$         |
| $c_{EE}$                             | 0.9908   | $0.992^{+0.011}_{-0.011}$       | $r_{\text{drag}}$           | 148.79   | $148.0^{+4.1}_{-4.0}$           | $\chi_{\text{CamSpec}}^2$   | 11498.5  | $11515.1 (\nu: 18.1)$     |
| $H_0$                                | 67.27    | $67.4^{+2.6}_{-2.5}$            | $k_{\text{D}}$              | 0.13954  | $0.1401^{+0.0029}_{-0.0029}$    | $\chi_{6\text{DF}}^2$       | 0.006    | $0.059 (\nu: 0.0)$        |
| $\Omega_\Lambda$                     | 0.6924   | $0.690^{+0.015}_{-0.015}$       | $100\theta_{\text{D}}$      | 0.16054  | $0.16073^{+0.00099}_{-0.00098}$ | $\chi_{\text{MGS}}^2$       | 1.47     | $1.36 (\nu: 0.1)$         |
| $\Omega_{\text{m}}$                  | 0.3076   | $0.310^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | 3391     | $3380^{+56}_{-56}$              | $\chi_{\text{DR12BAO}}^2$   | 3.77     | $4.8 (\nu: 1.3)$          |
| $\Omega_{\text{m}} h^2$              | 0.1392   | $0.1411^{+0.0072}_{-0.0069}$    | $k_{\text{eq}}$             | 0.010249 | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | 2.0      | $7.8 (\nu: 5.9)$          |
| $\Omega_\nu h^2$                     | 0.00002  | $< 0.00163$                     | $100\theta_{\text{eq}}$     | 0.8151   | $0.817^{+0.011}_{-0.011}$       | $\chi_{\text{BAO}}^2$       | 5.25     | $6.2 (\nu: 0.9)$          |
| $\Omega_{\text{m}} h^3$              | 0.0936   | $0.0952^{+0.0081}_{-0.0076}$    | $100\theta_{s,\text{eq}}$   | 0.4504   | $0.4514^{+0.0055}_{-0.0053}$    | $\chi_{\text{CMB}}^2$       | 11917.7  | $11935.2 (\nu: 17.8)$     |

Best-fit  $\chi_{\text{eff}}^2 = 11924.95$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.25$ ;  $\Delta\chi_{\text{eff}}^2 = 0.97$ ;  $R - 1 = 0.00978$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 MGS: 1.47 DR12BAO: 3.77 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.84 commander\_dx12\_v3\_2\_29: 23.33 CamSpec like\_10.7HM\_1400\_unified: 11498.54



# 8.11 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.022281 | $0.02232^{+0.00037}_{-0.00037}$ | $S_8$                       | 0.8234   | $0.818^{+0.028}_{-0.029}$       | $H(0.38)$                   | 82.67    | $82.9^{+2.6}_{-2.6}$      |
| $\Omega_c h^2$                       | 0.1174   | $0.1183^{+0.0069}_{-0.0065}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4510   | $0.448^{+0.015}_{-0.016}$       | $D_M(0.38)$                 | 1533     | $1531^{+52}_{-51}$        |
| $100\theta_{MC}$                     | 1.04116  | $1.04105^{+0.00096}_{-0.00090}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6061   | $0.601^{+0.019}_{-0.021}$       | $H(0.51)$                   | 89.30    | $89.6^{+2.8}_{-2.6}$      |
| $\tau$                               | 0.0525   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9914   | $0.981^{+0.028}_{-0.030}$       | $D_M(0.51)$                 | 1987     | $1984^{+66}_{-65}$        |
| $\Sigma m_\nu$ [eV]                  | 0.000    | < 0.148                         | $r_{\text{drag}} h$         | 100.22   | $99.9^{+1.8}_{-1.8}$            | $H(0.61)$                   | 94.84    | $95.1^{+2.8}_{-2.7}$      |
| $N_{\text{eff}}$                     | 2.938    | $3.01^{+0.42}_{-0.39}$          | $\langle d^2 \rangle^{1/2}$ | 2.436    | $2.424^{+0.054}_{-0.055}$       | $D_M(0.61)$                 | 2313     | $2309^{+76}_{-75}$        |
| $\ln(10^{10} A_s)$                   | 3.0329   | $3.037^{+0.038}_{-0.036}$       | $z_{\text{re}}$             | 7.45     | $7.6^{+1.6}_{-1.6}$             | $H(2.33)$                   | 234.1    | $235.2^{+6.1}_{-5.8}$     |
| $n_s$                                | 0.9640   | $0.966^{+0.015}_{-0.015}$       | $10^9 A_s$                  | 2.076    | $2.084^{+0.080}_{-0.074}$       | $D_M(2.33)$                 | 5794     | $5776^{+170}_{-160}$      |
| $y_{\text{cal}}$                     | 1.00039  | $1.0006^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8689   | $1.872^{+0.038}_{-0.038}$       | $f\sigma_8(0.15)$           | 0.4552   | $0.453^{+0.015}_{-0.015}$ |
| $A_{100}^{\text{PS}}$                | 229.2    | $239^{+50}_{-50}$               | $D_{40}$                    | 1226.8   | $1225^{+28}_{-27}$              | $\sigma_8(0.15)$            | 0.7531   | $0.746^{+0.026}_{-0.029}$ |
| $A_{143}^{\text{PS}}$                | 43.1     | $39^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5722^{+77}_{-76}$              | $f\sigma_8(0.38)$           | 0.4746   | $0.472^{+0.015}_{-0.016}$ |
| $A_{217}^{\text{PS}}$                | 104.4    | $102^{+30}_{-30}$               | $D_{810}$                   | 2533.7   | $2534^{+27}_{-27}$              | $\sigma_8(0.38)$            | 0.6679   | $0.661^{+0.023}_{-0.026}$ |
| $A_{217}^{\text{CIB}}$               | 42.2     | $40^{+10}_{-10}$                | $D_{1420}$                  | 817.1    | $816.3^{+9.6}_{-9.9}$           | $f\sigma_8(0.51)$           | 0.4737   | $0.471^{+0.015}_{-0.016}$ |
| $A_{143}^{\text{tSZ}}$               | 6.53     | < 7.50                          | $D_{2000}$                  | 231.29   | $230.7^{+4.1}_{-4.1}$           | $\sigma_8(0.51)$            | 0.6251   | $0.619^{+0.022}_{-0.025}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.675    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9640   | $0.966^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | 0.4691   | $0.466^{+0.015}_{-0.015}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.80     | —                               | $Y_P$                       | 0.2439   | $0.2448^{+0.0056}_{-0.0055}$    | $\sigma_8(0.61)$            | 0.5949   | $0.589^{+0.021}_{-0.024}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.45     | —                               | $Y_P^{\text{BBN}}$          | 0.2452   | $0.2461^{+0.0056}_{-0.0055}$    | $f\sigma_8(2.33)$           | 0.2992   | $0.297^{+0.010}_{-0.011}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.565    | $2.58^{+0.11}_{-0.11}$          | $\sigma_8(2.33)$            | 0.3091   | $0.306^{+0.011}_{-0.012}$ |
| $A_{100}^{\text{dust}}$              | 1.009    | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                     | 13.873   | $13.83^{+0.39}_{-0.39}$         | $f_{2000}^{143}$            | 28.8     | $29^{+7}_{-7}$            |
| $A_{143}^{\text{dust}}$              | 0.974    | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | 1089.70  | $1089.79^{+0.81}_{-0.81}$       | $f_{2000}^{217}$            | 105.86   | $106.6^{+4.4}_{-4.4}$     |
| $A_{217}^{\text{dust}}$              | 0.980    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 145.72   | $145.2^{+3.9}_{-3.9}$           | $f_{2000}^{143 \times 217}$ | 31.17    | $32^{+5}_{-5}$            |
| $A_{143 \times 217}^{\text{dust}}$   | 1.011    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04140  | $1.0413^{+0.0012}_{-0.0011}$    | $\chi_{\text{small}}^2$     | 395.79   | $397.0 (\nu: 1.5)$        |
| $c_{100}$                            | 0.99775  | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 13.993   | $13.94^{+0.36}_{-0.36}$         | $\chi_{\text{lowl}}^2$      | 23.28    | $23.0 (\nu: 0.7)$         |
| $c_{217}$                            | 1.00120  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.44  | $1059.6^{+1.5}_{-1.5}$          | $\chi_{\text{CamSpec}}^2$   | 11498.6  | $11515.2 (\nu: 18.1)$     |
| $c_{TE}$                             | 0.9957   | $0.9966^{+0.010}_{-0.0098}$     | $r_{\text{drag}}$           | 148.43   | $147.9^{+4.0}_{-4.0}$           | $\chi_{\text{JLA}}^2$       | 1034.85  | $1035.05 (\nu: 0.1)$      |
| $c_{EE}$                             | 0.9909   | $0.992^{+0.011}_{-0.011}$       | $k_D$                       | 0.13981  | $0.1402^{+0.0030}_{-0.0028}$    | $\chi_{6\text{DF}}^2$       | 0.003    | $0.047 (\nu: 0.0)$        |
| $H_0$                                | 67.52    | $67.6^{+2.5}_{-2.4}$            | $100\theta_D$               | 0.16059  | $0.16076^{+0.00099}_{-0.00098}$ | $\chi_{\text{MGS}}^2$       | 1.54     | $1.44 (\nu: 0.1)$         |
| $\Omega_\Lambda$                     | 0.6935   | $0.691^{+0.014}_{-0.015}$       | $z_{\text{eq}}$             | 3388     | $3377^{+54}_{-54}$              | $\chi_{\text{DR12BAO}}^2$   | 3.67     | $4.5 (\nu: 0.9)$          |
| $\Omega_m$                           | 0.3065   | $0.309^{+0.015}_{-0.014}$       | $k_{\text{eq}}$             | 0.010265 | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | 2.0      | $7.9 (\nu: 6.0)$          |
| $\Omega_m h^2$                       | 0.1397   | $0.1412^{+0.0072}_{-0.0068}$    | $100\theta_{\text{eq}}$     | 0.8156   | $0.818^{+0.010}_{-0.010}$       | $\chi_{\text{BAO}}^2$       | 5.21     | $6.0 (\nu: 0.6)$          |
| $\Omega_\nu h^2$                     | 0.00000  | < 0.00156                       | $100\theta_{s,\text{eq}}$   | 0.4507   | $0.4518^{+0.0053}_{-0.0052}$    | $\chi_{\text{CMB}}^2$       | 11917.7  | $11935.2 (\nu: 17.9)$     |
| $\Omega_m h^3$                       | 0.0943   | $0.0955^{+0.0082}_{-0.0075}$    | $H(0.15)$                   | 72.71    | $72.8^{+2.5}_{-2.5}$            |                             |          |                           |
| $\sigma_8$                           | 0.8146   | $0.807^{+0.027}_{-0.031}$       | $D_M(0.15)$                 | 642.5    | $642^{+23}_{-23}$               |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 12959.81$ ;  $\bar{\chi}_{\text{eff}}^2 = 12984.10$ ;  $R - 1 = 0.01027$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.54 DR12BAO: 3.67 CMB - simall\_100x143.offlike5\_EE\_Aplanck\_B: 395.79 commander\_dx12\_v3\_2\_29: 23.28 CamSpec like\_10.7HM\_1400\_unified: 11498.65 SN - JLA Pantheon18: 1034.85



## 8.12 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                  |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|-----------------------------|
| $\Omega_b h^2$                       | 0.022260 | $0.02228^{+0.00035}_{-0.00036}$ | $S_8$                       | 0.8258   | $0.819^{+0.029}_{-0.029}$       | $H(0.38)$                   | 82.46    | $82.6^{+2.2}_{-2.1}$        |
| $\Omega_c h^2$                       | 0.1173   | $0.1177^{+0.0057}_{-0.0054}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4523   | $0.448^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | 1538.1   | $1537^{+45}_{-45}$          |
| $100\theta_{MC}$                     | 1.04116  | $1.04111^{+0.00086}_{-0.00082}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6070   | $0.601^{+0.019}_{-0.021}$       | $H(0.51)$                   | 89.09    | $89.2^{+2.3}_{-2.2}$        |
| $\tau$                               | 0.0529   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9931   | $0.981^{+0.028}_{-0.031}$       | $D_M(0.51)$                 | 1993     | $1991^{+56}_{-57}$          |
| $\Sigma m_\nu$ [eV]                  | 0.003    | $< 0.150$                       | $r_{\text{drag}} h$         | 99.99    | $99.7^{+1.8}_{-1.8}$            | $H(0.61)$                   | 94.64    | $94.8^{+2.4}_{-2.3}$        |
| $N_{\text{eff}}$                     | 2.915    | $2.97^{+0.34}_{-0.32}$          | $\langle d^2 \rangle^{1/2}$ | 2.442    | $2.427^{+0.054}_{-0.055}$       | $D_M(0.61)$                 | 2320     | $2317^{+64}_{-65}$          |
| $\ln(10^{10} A_s)$                   | 3.0333   | $3.035^{+0.036}_{-0.035}$       | $z_{\text{re}}$             | 7.49     | $7.5^{+1.6}_{-1.6}$             | $H(2.33)$                   | 233.90   | $234.7^{+5.0}_{-4.9}$       |
| $n_s$                                | 0.9630   | $0.965^{+0.013}_{-0.013}$       | $10^9 A_s$                  | 2.077    | $2.080^{+0.075}_{-0.071}$       | $D_M(2.33)$                 | 5806     | $5794^{+140}_{-140}$        |
| $y_{\text{cal}}$                     | 1.00043  | $1.0006^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8682   | $1.870^{+0.033}_{-0.034}$       | $f\sigma_8(0.15)$           | 0.4564   | $0.453^{+0.015}_{-0.015}$   |
| $A_{100}^{\text{PS}}$                | 227.9    | $238^{+50}_{-50}$               | $D_{40}$                    | 1228.6   | $1226^{+27}_{-26}$              | $\sigma_8(0.15)$            | 0.7529   | $0.744^{+0.025}_{-0.027}$   |
| $A_{143}^{\text{PS}}$                | 44.6     | $38^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5721^{+78}_{-77}$              | $f\sigma_8(0.38)$           | 0.4754   | $0.471^{+0.014}_{-0.015}$   |
| $A_{217}^{\text{PS}}$                | 104.8    | $102^{+30}_{-30}$               | $D_{810}$                   | 2534.0   | $2533^{+27}_{-27}$              | $\sigma_8(0.38)$            | 0.6675   | $0.659^{+0.023}_{-0.024}$   |
| $A_{217}^{\text{CIB}}$               | 41.7     | $39^{+10}_{-10}$                | $D_{1420}$                  | 817.4    | $816.6^{+9.5}_{-9.8}$           | $f\sigma_8(0.51)$           | 0.4743   | $0.470^{+0.014}_{-0.015}$   |
| $A_{143}^{\text{tSZ}}$               | 6.48     | $< 7.52$                        | $D_{2000}$                  | 231.51   | $230.9^{+3.8}_{-3.8}$           | $\sigma_8(0.51)$            | 0.6248   | $0.617^{+0.022}_{-0.023}$   |
| $r_{143 \times 217}^{\text{PS}}$     | 0.700    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9630   | $0.965^{+0.013}_{-0.013}$       | $f\sigma_8(0.61)$           | 0.4695   | $0.465^{+0.014}_{-0.015}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.82     | —                               | $Y_{\text{P}}$              | 0.24358  | $0.2443^{+0.0046}_{-0.0045}$    | $\sigma_8(0.61)$            | 0.5945   | $0.587^{+0.021}_{-0.022}$   |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.59     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.24490  | $0.2456^{+0.0046}_{-0.0045}$    | $f\sigma_8(2.33)$           | 0.2989   | $0.2961^{+0.0095}_{-0.011}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.561    | $2.575^{+0.097}_{-0.096}$       | $\sigma_8(2.33)$            | 0.3087   | $0.305^{+0.010}_{-0.012}$   |
| $A_{100}^{\text{dust}}$              | 1.007    | $1.01^{+0.39}_{-0.39}$          | $\text{Age/Gyr}$            | 13.899   | $13.87^{+0.32}_{-0.33}$         | $f_{2000}^{143}$            | 28.5     | $29^{+6}_{-6}$              |
| $A_{143}^{\text{dust}}$              | 0.973    | $0.96^{+0.34}_{-0.35}$          | $z_*$                       | 1089.68  | $1089.75^{+0.72}_{-0.71}$       | $f_{2000}^{217}$            | 105.58   | $106.4^{+4.3}_{-4.2}$       |
| $A_{217}^{\text{dust}}$              | 0.981    | $0.98^{+0.21}_{-0.20}$          | $r_*$                       | 145.90   | $145.5^{+3.2}_{-3.2}$           | $f_{2000}^{143 \times 217}$ | 30.92    | $32^{+5}_{-5}$              |
| $A_{143 \times 217}^{\text{dust}}$   | 1.006    | $1.02^{+0.31}_{-0.31}$          | $100\theta_*$               | 1.04141  | $1.0414^{+0.0010}_{-0.00099}$   | $\chi_{\text{small}}^2$     | 395.83   | $396.9 (\nu: 1.5)$          |
| $c_{100}$                            | 0.99779  | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 14.010   | $13.97^{+0.30}_{-0.30}$         | $\chi_{\text{lowl}}^2$      | 23.45    | $23.2 (\nu: 0.6)$           |
| $c_{217}$                            | 1.00120  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.36  | $1059.5^{+1.3}_{-1.3}$          | $\chi_{\text{CamSpec}}^2$   | 11498.3  | $11514.7 (\nu: 17.3)$       |
| $c_{TE}$                             | 0.9955   | $0.9963^{+0.010}_{-0.0097}$     | $r_{\text{drag}}$           | 148.62   | $148.2^{+3.4}_{-3.3}$           | $\chi_{\text{Aver15}}^2$    | 0.00     | $0.37 (\nu: 0.1)$           |
| $c_{EE}$                             | 0.9906   | $0.992^{+0.011}_{-0.011}$       | $k_{\text{D}}$              | 0.13968  | $0.1399^{+0.0024}_{-0.0024}$    | $\chi_{6\text{DF}}^2$       | 0.010    | $0.060 (\nu: 0.0)$          |
| $H_0$                                | 67.28    | $67.3^{+2.2}_{-2.1}$            | $100\theta_{\text{D}}$      | 0.16053  | $0.16068^{+0.00084}_{-0.00083}$ | $\chi_{\text{MGS}}^2$       | 1.41     | $1.33 (\nu: 0.1)$           |
| $\Omega_\Lambda$                     | 0.6917   | $0.689^{+0.014}_{-0.015}$       | $z_{\text{eq}}$             | 3394     | $3382^{+53}_{-54}$              | $\chi_{\text{DR12BAO}}^2$   | 3.90     | $4.8 (\nu: 1.3)$            |
| $\Omega_{\text{m}}$                  | 0.3083   | $0.311^{+0.015}_{-0.014}$       | $k_{\text{eq}}$             | 0.010268 | $0.01027^{+0.00022}_{-0.00021}$ | $\chi_{\text{prior}}^2$     | 2.0      | $7.8 (\nu: 5.9)$            |
| $\Omega_{\text{m}} h^2$              | 0.1396   | $0.1406^{+0.0060}_{-0.0057}$    | $100\theta_{\text{eq}}$     | 0.8144   | $0.817^{+0.010}_{-0.010}$       | $\chi_{\text{BAO}}^2$       | 5.31     | $6.2 (\nu: 0.9)$            |
| $\Omega_\nu h^2$                     | 0.00003  | $< 0.00158$                     | $100\theta_{\text{s,eq}}$   | 0.4501   | $0.4513^{+0.0052}_{-0.0051}$    | $\chi_{\text{CMB}}^2$       | 11917.6  | $11934.8 (\nu: 17.2)$       |
| $\Omega_{\text{m}} h^3$              | 0.0939   | $0.0947^{+0.0066}_{-0.0062}$    | $H(0.15)$                   | 72.48    | $72.5^{+2.2}_{-2.1}$            |                             |          |                             |
| $\sigma_8$                           | 0.8146   | $0.805^{+0.027}_{-0.029}$       | $D_M(0.15)$                 | 644.6    | $644^{+20}_{-20}$               |                             |          |                             |

Best-fit  $\chi_{\text{eff}}^2 = 11924.93$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.22$ ;  $R - 1 = 0.01005$

$\chi_{\text{eff}}^2$ : Abund - Yp\_Aver2015: 0.00 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.90 CMB - simall\_100x143.offlike5\_EE\_Aplanck\_B: 395.83 commander\_dx12\_v3.2.29: 23.45 CamSpec like\_10.7HM.1400\_unified: 11498.32



### 8.13 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Cooke17\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                  |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|-----------------------------|
| $\Omega_b h^2$                       | 0.022251 | $0.02228^{+0.00035}_{-0.00036}$ | $S_8$                       | 0.8282   | $0.820^{+0.028}_{-0.029}$       | $H(0.38)$                   | 82.70    | $82.7^{+2.1}_{-2.1}$        |
| $\Omega_c h^2$                       | 0.1181   | $0.1182^{+0.0053}_{-0.0051}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4536   | $0.449^{+0.015}_{-0.016}$       | $D_M(0.38)$                 | 1533.6   | $1535^{+44}_{-43}$          |
| $100\theta_{MC}$                     | 1.04108  | $1.04105^{+0.00081}_{-0.00077}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6088   | $0.601^{+0.019}_{-0.020}$       | $H(0.51)$                   | 89.35    | $89.4^{+2.2}_{-2.1}$        |
| $\tau$                               | 0.0531   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9946   | $0.981^{+0.028}_{-0.031}$       | $D_M(0.51)$                 | 1987     | $1988^{+55}_{-54}$          |
| $\Sigma m_\nu$ [eV]                  | 0.003    | < 0.151                         | $r_{\text{drag}} h$         | 99.99    | $99.7^{+1.8}_{-1.8}$            | $H(0.61)$                   | 94.92    | $95.0^{+2.2}_{-2.2}$        |
| $N_{\text{eff}}$                     | 2.959    | $2.99^{+0.31}_{-0.30}$          | $\langle d^2 \rangle^{1/2}$ | 2.442    | $2.427^{+0.054}_{-0.056}$       | $D_M(0.61)$                 | 2313     | $2313^{+63}_{-62}$          |
| $\ln(10^{10} A_s)$                   | 3.0355   | $3.036^{+0.036}_{-0.034}$       | $z_{\text{re}}$             | 7.53     | $7.5^{+1.6}_{-1.6}$             | $H(2.33)$                   | 234.58   | $235.1^{+4.6}_{-4.5}$       |
| $n_s$                                | 0.9642   | $0.965^{+0.013}_{-0.013}$       | $10^9 A_s$                  | 2.081    | $2.082^{+0.075}_{-0.071}$       | $D_M(2.33)$                 | 5789     | $5784^{+130}_{-130}$        |
| $y_{\text{cal}}$                     | 1.00034  | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8715   | $1.872^{+0.032}_{-0.032}$       | $f\sigma_8(0.15)$           | 0.4578   | $0.454^{+0.015}_{-0.015}$   |
| $A_{100}^{\text{PS}}$                | 229.6    | $239^{+50}_{-50}$               | $D_{40}$                    | 1226.9   | $1226^{+27}_{-26}$              | $\sigma_8(0.15)$            | 0.7552   | $0.745^{+0.025}_{-0.027}$   |
| $A_{143}^{\text{PS}}$                | 44.4     | $39^{+20}_{-20}$                | $D_{220}$                   | 5715     | $5720^{+78}_{-76}$              | $f\sigma_8(0.38)$           | 0.4768   | $0.472^{+0.014}_{-0.015}$   |
| $A_{217}^{\text{PS}}$                | 103.9    | $102^{+30}_{-30}$               | $D_{810}$                   | 2533.7   | $2534^{+27}_{-27}$              | $\sigma_8(0.38)$            | 0.6695   | $0.660^{+0.023}_{-0.024}$   |
| $A_{217}^{\text{CIB}}$               | 42.7     | $39^{+10}_{-10}$                | $D_{1420}$                  | 816.5    | $816.2^{+9.4}_{-9.6}$           | $f\sigma_8(0.51)$           | 0.4757   | $0.471^{+0.014}_{-0.015}$   |
| $A_{143}^{\text{tSZ}}$               | 6.51     | < 7.49                          | $D_{2000}$                  | 231.02   | $230.6^{+3.6}_{-3.6}$           | $\sigma_8(0.51)$            | 0.6266   | $0.618^{+0.021}_{-0.023}$   |
| $r_{143 \times 217}^{\text{PS}}$     | 0.676    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9642   | $0.965^{+0.013}_{-0.013}$       | $f\sigma_8(0.61)$           | 0.4709   | $0.466^{+0.013}_{-0.015}$   |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.83     | —                               | $Y_{\text{P}}$              | 0.24418  | $0.2446^{+0.0043}_{-0.0043}$    | $\sigma_8(0.61)$            | 0.5963   | $0.588^{+0.020}_{-0.022}$   |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.49     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.24550  | $0.2459^{+0.0043}_{-0.0043}$    | $f\sigma_8(2.33)$           | 0.2998   | $0.2965^{+0.0097}_{-0.010}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.578    | $2.584^{+0.087}_{-0.085}$       | $\sigma_8(2.33)$            | 0.3097   | $0.306^{+0.011}_{-0.011}$   |
| $A_{100}^{\text{dust}}$              | 1.008    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.859   | $13.85^{+0.31}_{-0.31}$         | $f_{2000}^{143}$            | 29.1     | $29^{+6}_{-6}$              |
| $A_{143}^{\text{dust}}$              | 0.974    | $0.96^{+0.34}_{-0.35}$          | $z_*$                       | 1089.81  | $1089.81^{+0.65}_{-0.64}$       | $f_{2000}^{217}$            | 106.06   | $106.6^{+4.2}_{-4.1}$       |
| $A_{217}^{\text{dust}}$              | 0.978    | $0.98^{+0.21}_{-0.20}$          | $r_*$                       | 145.46   | $145.3^{+3.0}_{-3.0}$           | $f_{2000}^{143 \times 217}$ | 31.41    | $32^{+4}_{-4}$              |
| $A_{143 \times 217}^{\text{dust}}$   | 1.000    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04130  | $1.04128^{+0.00097}_{-0.00092}$ | $\chi_{\text{small}}^2$     | 395.85   | $396.9 (\nu: 1.4)$          |
| $c_{100}$                            | 0.99775  | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | 13.970   | $13.95^{+0.28}_{-0.28}$         | $\chi_{\text{lowl}}^2$      | 23.31    | $23.1 (\nu: 0.6)$           |
| $c_{217}$                            | 1.00127  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.44  | $1059.6^{+1.3}_{-1.3}$          | $\chi_{\text{CamSpec}}^2$   | 11498.5  | $11514.7 (\nu: 17.2)$       |
| $c_{TE}$                             | 0.9960   | $0.9966^{+0.010}_{-0.0097}$     | $r_{\text{drag}}$           | 148.18   | $148.0^{+3.1}_{-3.1}$           | $\chi_{\text{Aver15}}^2$    | 0.02     | $0.36 (\nu: 0.1)$           |
| $c_{EE}$                             | 0.9914   | $0.992^{+0.010}_{-0.010}$       | $k_{\text{D}}$              | 0.13996  | $0.1401^{+0.0023}_{-0.0023}$    | $\chi_{\text{Cooke17}}^2$   | 0.18     | $0.35 (\nu: 0.1)$           |
| $H_0$                                | 67.48    | $67.4^{+2.1}_{-2.1}$            | $100\theta_{\text{D}}$      | 0.16068  | $0.16075^{+0.00075}_{-0.00073}$ | $\chi_{6\text{DF}}^2$       | 0.010    | $0.059 (\nu: 0.0)$          |
| $\Omega_\Lambda$                     | 0.6917   | $0.689^{+0.014}_{-0.015}$       | $z_{\text{eq}}$             | 3393     | $3381^{+54}_{-54}$              | $\chi_{\text{MGS}}^2$       | 1.41     | $1.33 (\nu: 0.1)$           |
| $\Omega_{\text{m}}$                  | 0.3083   | $0.311^{+0.015}_{-0.014}$       | $k_{\text{eq}}$             | 0.010295 | $0.01028^{+0.00021}_{-0.00021}$ | $\chi_{\text{DR12BAO}}^2$   | 3.90     | $4.8 (\nu: 1.3)$            |
| $\Omega_{\text{m}} h^2$              | 0.1404   | $0.1411^{+0.0056}_{-0.0054}$    | $100\theta_{\text{eq}}$     | 0.8146   | $0.817^{+0.010}_{-0.010}$       | $\chi_{\text{prior}}^2$     | 2.0      | $7.8 (\nu: 5.9)$            |
| $\Omega_\nu h^2$                     | 0.00004  | < 0.00160                       | $100\theta_{\text{s,eq}}$   | 0.4502   | $0.4514^{+0.0052}_{-0.0051}$    | $\chi_{\text{BAO}}^2$       | 5.32     | $6.2 (\nu: 0.9)$            |
| $\Omega_{\text{m}} h^3$              | 0.0947   | $0.0951^{+0.0062}_{-0.0059}$    | $H(0.15)$                   | 72.70    | $72.7^{+2.1}_{-2.1}$            | $\chi_{\text{CMB}}^2$       | 11917.6  | $11934.7 (\nu: 17.0)$       |
| $\sigma_8$                           | 0.8170   | $0.806^{+0.027}_{-0.029}$       | $D_M(0.15)$                 | 642.7    | $643^{+19}_{-19}$               | $\chi_{\text{Abund}}^2$     | 0.20     | $0.71 (\nu: 0.2)$           |

Best-fit  $\chi_{\text{eff}}^2 = 11925.20$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.45$ ;  $R - 1 = 0.01051$

$\chi_{\text{eff}}^2$ : Abund - Yp\_Aver2015: 0.02 D\_Cooke2017: 0.18 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.90 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12.v3.2.29: 23.31 CamSpec like\_10.7HM.1400\_unified: 11498.48



8.14 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02232^{+0.00037}_{-0.00037}$ | $S_8$                       | $0.819^{+0.028}_{-0.029}$       | $H(0.38)$                   | $82.9^{+2.6}_{-2.6}$      |
| $\Omega_c h^2$                       | $0.1183^{+0.0069}_{-0.0066}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.015}_{-0.016}$       | $D_M(0.38)$                 | $1531^{+53}_{-51}$        |
| $100\theta_{MC}$                     | $1.04105^{+0.00096}_{-0.00090}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.019}_{-0.021}$       | $H(0.51)$                   | $89.6^{+2.7}_{-2.7}$      |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.982^{+0.027}_{-0.030}$       | $D_M(0.51)$                 | $1983^{+67}_{-65}$        |
| $\Sigma m_\nu$ [eV]                  | $< 0.149$                       | $r_{\text{drag}} h$         | $99.9^{+1.8}_{-1.8}$            | $H(0.61)$                   | $95.2^{+2.8}_{-2.8}$      |
| $N_{\text{eff}}$                     | $3.01^{+0.42}_{-0.40}$          | $\langle d^2 \rangle^{1/2}$ | $2.427^{+0.052}_{-0.053}$       | $D_M(0.61)$                 | $2308^{+76}_{-75}$        |
| $\ln(10^{10} A_s)$                   | $3.039^{+0.034}_{-0.032}$       | $z_{\text{re}}$             | $< 8.92$                        | $H(2.33)$                   | $235.2^{+6.1}_{-5.8}$     |
| $n_s$                                | $0.966^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.090^{+0.071}_{-0.067}$       | $D_M(2.33)$                 | $5775^{+170}_{-160}$      |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | $1.872^{+0.038}_{-0.039}$       | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$ |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                    | $1224^{+28}_{-28}$              | $\sigma_8(0.15)$            | $0.747^{+0.025}_{-0.029}$ |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5722^{+77}_{-77}$              | $f\sigma_8(0.38)$           | $0.472^{+0.015}_{-0.015}$ |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                   | $2534^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.662^{+0.023}_{-0.026}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $816.3^{+9.7}_{-10}$            | $f\sigma_8(0.51)$           | $0.471^{+0.014}_{-0.015}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.50$                        | $D_{2000}$                  | $230.7^{+4.1}_{-4.1}$           | $\sigma_8(0.51)$            | $0.620^{+0.021}_{-0.024}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | $0.966^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | $0.467^{+0.014}_{-0.015}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$              | $0.2449^{+0.0056}_{-0.0055}$    | $\sigma_8(0.61)$            | $0.590^{+0.021}_{-0.023}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$ | $0.2462^{+0.0056}_{-0.0055}$    | $f\sigma_8(2.33)$           | $0.297^{+0.010}_{-0.011}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D/H}$           | $2.58^{+0.11}_{-0.11}$          | $\sigma_8(2.33)$            | $0.307^{+0.011}_{-0.012}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $\text{Age/Gyr}$            | $13.83^{+0.40}_{-0.39}$         | $f_{2000}^{143}$            | $29^{+7}_{-6}$            |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | $1089.79^{+0.81}_{-0.81}$       | $f_{2000}^{217}$            | $106.5^{+4.5}_{-4.4}$     |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $145.1^{+3.9}_{-3.9}$           | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.0413^{+0.0012}_{-0.0011}$    | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.6)$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.94^{+0.36}_{-0.36}$         | $\chi_{\text{lowl}}^2$      | $23.0 (\nu: 0.7)$         |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.7^{+1.5}_{-1.5}$          | $\chi_{\text{CamSpec}}^2$   | $11515.1 (\nu: 17.9)$     |
| $c_{TE}$                             | $0.9965^{+0.010}_{-0.0098}$     | $r_{\text{drag}}$           | $147.8^{+4.1}_{-4.0}$           | $\chi_{\text{JLA}}^2$       | $1035.04 (\nu: 0.1)$      |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.011}$       | $k_{\text{D}}$              | $0.1402^{+0.0029}_{-0.0029}$    | $\chi_{6\text{DF}}^2$       | $0.046 (\nu: 0.0)$        |
| $H_0$                                | $67.6^{+2.5}_{-2.4}$            | $100\theta_{\text{D}}$      | $0.1608^{+0.0010}_{-0.00099}$   | $\chi_{\text{MGS}}^2$       | $1.45 (\nu: 0.1)$         |
| $\Omega_\Lambda$                     | $0.691^{+0.014}_{-0.015}$       | $z_{\text{eq}}$             | $3376^{+54}_{-54}$              | $\chi_{\text{DR12BAO}}^2$   | $4.5 (\nu: 0.9)$          |
| $\Omega_m$                           | $0.309^{+0.015}_{-0.014}$       | $k_{\text{eq}}$             | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.0)$          |
| $\Omega_m h^2$                       | $0.1412^{+0.0072}_{-0.0069}$    | $100\theta_{\text{eq}}$     | $0.818^{+0.010}_{-0.010}$       | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.6)$          |
| $\Omega_\nu h^2$                     | $< 0.00157$                     | $100\theta_{s,\text{eq}}$   | $0.4518^{+0.0053}_{-0.0051}$    | $\chi_{\text{CMB}}^2$       | $11935.0 (\nu: 17.5)$     |
| $\Omega_m h^3$                       | $0.0955^{+0.0082}_{-0.0076}$    | $H(0.15)$                   | $72.9^{+2.5}_{-2.5}$            |                             |                           |
| $\sigma_8$                           | $0.808^{+0.027}_{-0.031}$       | $D_M(0.15)$                 | $641^{+23}_{-22}$               |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 12983.89; R - 1 = 0.01046$$



## 8.15 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.022197 | $0.02221^{+0.00045}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4546   | $0.452^{+0.014}_{-0.014}$       | $H(0.38)$                   | 83.07    | $83.0^{+3.0}_{-2.9}$      |
| $\Omega_c h^2$                       | 0.1191   | $0.1191^{+0.0076}_{-0.0072}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6104   | $0.606^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | 1527     | $1530^{+60}_{-59}$        |
| $100\theta_{MC}$                     | 1.04103  | $1.0410^{+0.0012}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9955   | $0.987^{+0.021}_{-0.024}$       | $H(0.51)$                   | 89.74    | $89.7^{+3.2}_{-3.0}$      |
| $\tau$                               | 0.0530   | $0.055^{+0.016}_{-0.014}$       | $r_{\text{drag}} h$         | 100.10   | $99.8^{+2.0}_{-2.0}$            | $D_M(0.51)$                 | 1978     | $1982^{+76}_{-75}$        |
| $\Sigma m_\nu$ [eV]                  | 0.003    | $< 0.135$                       | $\langle d^2 \rangle^{1/2}$ | 2.4429   | $2.434^{+0.047}_{-0.047}$       | $H(0.61)$                   | 95.32    | $95.3^{+3.2}_{-3.1}$      |
| $N_{\text{eff}}$                     | 3.024    | $3.04^{+0.47}_{-0.45}$          | $z_{\text{re}}$             | 7.56     | $7.7^{+1.5}_{-1.5}$             | $D_M(0.61)$                 | 2302     | $2306^{+87}_{-86}$        |
| $\ln(10^{10} A_s)$                   | 3.0373   | $3.041^{+0.037}_{-0.035}$       | $10^9 A_s$                  | 2.085    | $2.093^{+0.078}_{-0.072}$       | $H(2.33)$                   | 235.4    | $235.7^{+6.8}_{-6.6}$     |
| $n_s$                                | 0.9647   | $0.966^{+0.017}_{-0.017}$       | $10^9 A_s e^{-2\tau}$       | 1.8752   | $1.876^{+0.040}_{-0.041}$       | $D_M(2.33)$                 | 5765     | $5768^{+190}_{-190}$      |
| $y_{\text{cal}}$                     | 1.00039  | $1.0006^{+0.0048}_{-0.0048}$    | $D_{40}$                    | 1227.0   | $1225^{+29}_{-29}$              | $f\sigma_8(0.15)$           | 0.4588   | $0.457^{+0.013}_{-0.013}$ |
| $A_{100}^{\text{PS}}$                | 243.8    | $242^{+50}_{-50}$               | $D_{220}$                   | 5710     | $5713^{+77}_{-79}$              | $\sigma_8(0.15)$            | 0.7578   | $0.750^{+0.024}_{-0.024}$ |
| $A_{143}^{\text{PS}}$                | 37.1     | $40^{+20}_{-20}$                | $D_{810}$                   | 2531.6   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4781   | $0.475^{+0.013}_{-0.013}$ |
| $A_{217}^{\text{PS}}$                | 99.5     | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.0    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6719   | $0.665^{+0.022}_{-0.022}$ |
| $A_{217}^{\text{CIB}}$               | 42.6     | $41^{+10}_{-10}$                | $D_{2000}$                  | 229.75   | $230.0^{+4.5}_{-4.5}$           | $f\sigma_8(0.51)$           | 0.4770   | $0.474^{+0.013}_{-0.013}$ |
| $A_{143}^{\text{tSZ}}$               | 4.28     | $< 7.39$                        | $n_{s,0.002}$               | 0.9647   | $0.966^{+0.017}_{-0.017}$       | $\sigma_8(0.51)$            | 0.6289   | $0.623^{+0.021}_{-0.021}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.542    | $0.65^{+0.26}_{-0.25}$          | $Y_{\text{P}}$              | 0.2450   | $0.2452^{+0.0063}_{-0.0062}$    | $f\sigma_8(0.61)$           | 0.4723   | $0.469^{+0.013}_{-0.013}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.66     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2464   | $0.2465^{+0.0063}_{-0.0063}$    | $\sigma_8(0.61)$            | 0.5984   | $0.592^{+0.020}_{-0.020}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.00     | —                               | $10^5 D/H$                  | 2.611    | $2.61^{+0.14}_{-0.13}$          | $f\sigma_8(2.33)$           | 0.3010   | $0.299^{+0.010}_{-0.010}$ |
| $A^{\text{kSZ}}$                     | 3.7      | —                               | Age/Gyr                     | 13.802   | $13.81^{+0.45}_{-0.44}$         | $\sigma_8(2.33)$            | 0.3109   | $0.308^{+0.011}_{-0.011}$ |
| $A_{100}^{\text{dust}}$              | 0.999    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1090.04  | $1090.03^{+0.96}_{-0.92}$       | $f_{2000}^{143}$            | 30.8     | $30^{+7}_{-7}$            |
| $A_{143}^{\text{dust}}$              | 0.977    | $0.97^{+0.34}_{-0.35}$          | $r_*$                       | 144.90   | $144.9^{+4.4}_{-4.4}$           | $f_{2000}^{217}$            | 107.42   | $107.3^{+4.8}_{-4.6}$     |
| $A_{217}^{\text{dust}}$              | 0.974    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04122  | $1.0412^{+0.0014}_{-0.0013}$    | $f_{2000}^{143 \times 217}$ | 32.6     | $33^{+5}_{-5}$            |
| $A_{143 \times 217}^{\text{dust}}$   | 1.009    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.916   | $13.91^{+0.41}_{-0.41}$         | $\chi_{\text{lensing}}^2$   | 8.90     | $9.51 (\nu: 0.4)$         |
| $c_{100}$                            | 0.99736  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.44  | $1059.5^{+1.7}_{-1.7}$          | $\chi_{\text{small}}^2$     | 395.85   | $397.1 (\nu: 1.7)$        |
| $c_{217}$                            | 1.00127  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | 147.63   | $147.6^{+4.6}_{-4.5}$           | $\chi_{\text{lowl}}^2$      | 23.31    | $23.2 (\nu: 0.8)$         |
| $H_0$                                | 67.80    | $67.6^{+2.9}_{-2.8}$            | $k_{\text{D}}$              | 0.14025  | $0.1403^{+0.0033}_{-0.0032}$    | $\chi_{\text{CamSpec}}^2$   | 7049.9   | $7063.7 (\nu: 14.8)$      |
| $\Omega_\Lambda$                     | 0.6925   | $0.690^{+0.016}_{-0.016}$       | $100\theta_{\text{D}}$      | 0.16096  | $0.1610^{+0.0012}_{-0.0011}$    | $\chi_{6\text{DF}}^2$       | 0.006    | $0.062 (\nu: 0.0)$        |
| $\Omega_m$                           | 0.3075   | $0.310^{+0.016}_{-0.016}$       | $z_{\text{eq}}$             | 3387     | $3380^{+60}_{-60}$              | $\chi_{\text{MGS}}^2$       | 1.47     | $1.38 (\nu: 0.2)$         |
| $\Omega_m h^2$                       | 0.1414   | $0.1419^{+0.0082}_{-0.0077}$    | $k_{\text{eq}}$             | 0.010324 | $0.01031^{+0.00027}_{-0.00027}$ | $\chi_{\text{DR12BAO}}^2$   | 3.77     | $4.8 (\nu: 1.4)$          |
| $\Omega_\nu h^2$                     | 0.00003  | $< 0.00144$                     | $100\theta_{\text{eq}}$     | 0.8155   | $0.817^{+0.011}_{-0.011}$       | $\chi_{\text{prior}}^2$     | 2.3      | $7.6 (\nu: 5.9)$          |
| $\Omega_m h^3$                       | 0.0959   | $0.0960^{+0.0093}_{-0.0086}$    | $100\theta_{s,\text{eq}}$   | 0.4506   | $0.4515^{+0.0058}_{-0.0057}$    | $\chi_{\text{CMB}}^2$       | 7478.0   | $7493.5 (\nu: 16.0)$      |
| $\sigma_8$                           | 0.8198   | $0.812^{+0.025}_{-0.026}$       | $H(0.15)$                   | 73.04    | $72.9^{+3.0}_{-2.8}$            | $\chi_{\text{BAO}}^2$       | 5.25     | $6.2 (\nu: 1.0)$          |
| $S_8$                                | 0.8299   | $0.825^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | 639.7    | $641^{+27}_{-26}$               |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 7485.59$ ;  $\bar{\chi}_{\text{eff}}^2 = 7507.28$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.80$ ;  $R - 1 = 0.00494$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 MGS: 1.47 DR12BAO: 3.77 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.90 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.85 comman-  
der\_dx12\_v3\_2\_29: 23.31 CamSpec like\_10.7HM: 7049.94



# 8.16 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                 |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|----------------------------|
| $\Omega_b h^2$                       | 0.022187 | $0.02223^{+0.00044}_{-0.00045}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4533   | $0.451^{+0.014}_{-0.014}$       | $H(0.38)$                   | 83.01    | $83.1^{+3.0}_{-2.9}$       |
| $\Omega_c h^2$                       | 0.1187   | $0.1192^{+0.0076}_{-0.0073}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6092   | $0.606^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | 1527     | $1526^{+58}_{-57}$         |
| $100\theta_{MC}$                     | 1.04110  | $1.0410^{+0.0011}_{-0.0011}$    | $\sigma_8/h^{0.5}$          | 0.9944   | $0.987^{+0.022}_{-0.023}$       | $H(0.51)$                   | 89.66    | $89.8^{+3.1}_{-3.0}$       |
| $\tau$                               | 0.0530   | $0.055^{+0.016}_{-0.014}$       | $r_{\text{drag}} h$         | 100.22   | $99.97^{+1.9}_{-1.8}$           | $D_M(0.51)$                 | 1979     | $1977^{+73}_{-72}$         |
| $\Sigma m_\nu$ [eV]                  | 0.001    | < 0.131                         | $\langle d^2 \rangle^{1/2}$ | 2.4402   | $2.432^{+0.046}_{-0.047}$       | $H(0.61)$                   | 95.23    | $95.4^{+3.2}_{-3.1}$       |
| $N_{\text{eff}}$                     | 3.008    | $3.06^{+0.47}_{-0.44}$          | $z_{\text{re}}$             | 7.56     | $7.8^{+1.5}_{-1.5}$             | $D_M(0.61)$                 | 2304     | $2301^{+84}_{-83}$         |
| $\ln(10^{10} A_s)$                   | 3.0365   | $3.042^{+0.036}_{-0.034}$       | $10^9 A_s$                  | 2.083    | $2.095^{+0.077}_{-0.071}$       | $H(2.33)$                   | 235.1    | $235.9^{+6.8}_{-6.5}$      |
| $n_s$                                | 0.9648   | $0.967^{+0.017}_{-0.017}$       | $10^9 A_s e^{-2\tau}$       | 1.8737   | $1.877^{+0.040}_{-0.040}$       | $D_M(2.33)$                 | 5771     | $5759^{+180}_{-180}$       |
| $y_{\text{cal}}$                     | 1.00044  | $1.0006^{+0.0048}_{-0.0049}$    | $D_{40}$                    | 1226.4   | $1224^{+28}_{-28}$              | $f\sigma_8(0.15)$           | 0.4576   | $0.456^{+0.013}_{-0.013}$  |
| $A_{100}^{\text{PS}}$                | 238.6    | $242^{+50}_{-50}$               | $D_{220}$                   | 5711     | $5714^{+77}_{-79}$              | $\sigma_8(0.15)$            | 0.7569   | $0.751^{+0.024}_{-0.024}$  |
| $A_{143}^{\text{PS}}$                | 38.8     | $41^{+20}_{-20}$                | $D_{810}$                   | 2532.1   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4770   | $0.475^{+0.013}_{-0.013}$  |
| $A_{217}^{\text{PS}}$                | 99.7     | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.6    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6712   | $0.666^{+0.022}_{-0.022}$  |
| $A_{217}^{\text{CIB}}$               | 45.3     | $41^{+10}_{-10}$                | $D_{2000}$                  | 229.98   | $229.9^{+4.5}_{-4.4}$           | $f\sigma_8(0.51)$           | 0.4761   | $0.474^{+0.013}_{-0.013}$  |
| $A_{143}^{\text{tSZ}}$               | 6.10     | < 7.38                          | $n_{s,0.002}$               | 0.9648   | $0.967^{+0.017}_{-0.017}$       | $\sigma_8(0.51)$            | 0.6283   | $0.623^{+0.021}_{-0.021}$  |
| $r_{143 \times 217}^{\text{PS}}$     | 0.559    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.2448   | $0.2454^{+0.0062}_{-0.0062}$    | $f\sigma_8(0.61)$           | 0.4714   | $0.469^{+0.013}_{-0.013}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.76     | —                               | $Y_P^{\text{BBN}}$          | 0.2461   | $0.2468^{+0.0062}_{-0.0062}$    | $\sigma_8(0.61)$            | 0.5979   | $0.593^{+0.020}_{-0.020}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.01     | —                               | $10^5 D/H$                  | 2.607    | $2.62^{+0.13}_{-0.13}$          | $f\sigma_8(2.33)$           | 0.3007   | $0.299^{+0.010}_{-0.0097}$ |
| $A^{\text{kSZ}}$                     | 0.9      | —                               | Age/Gyr                     | 13.817   | $13.79^{+0.44}_{-0.44}$         | $\sigma_8(2.33)$            | 0.3106   | $0.309^{+0.011}_{-0.011}$  |
| $A_{100}^{\text{dust}}$              | 1.018    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1089.99  | $1090.03^{+0.95}_{-0.93}$       | $f_{2000}^{143}$            | 30.8     | $31^{+7}_{-7}$             |
| $A_{143}^{\text{dust}}$              | 0.986    | $0.97^{+0.35}_{-0.34}$          | $r_*$                       | 145.11   | $144.7^{+4.4}_{-4.3}$           | $f_{2000}^{217}$            | 107.29   | $107.4^{+4.7}_{-4.6}$      |
| $A_{217}^{\text{dust}}$              | 0.963    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04129  | $1.0412^{+0.0014}_{-0.0013}$    | $f_{2000}^{143 \times 217}$ | 32.6     | $33^{+5}_{-5}$             |
| $A_{143 \times 217}^{\text{dust}}$   | 1.004    | $1.03^{+0.33}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.936   | $13.90^{+0.41}_{-0.40}$         | $\chi_{\text{lensing}}^2$   | 8.87     | $9.55 (\nu: 0.4)$          |
| $c_{100}$                            | 0.99757  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.40  | $1059.6^{+1.7}_{-1.7}$          | $\chi_{\text{small}}^2$     | 395.85   | $397.1 (\nu: 1.7)$         |
| $c_{217}$                            | 1.00137  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | 147.84   | $147.4^{+4.5}_{-4.5}$           | $\chi_{\text{lowl}}^2$      | 23.25    | $23.0 (\nu: 0.7)$          |
| $H_0$                                | 67.79    | $67.8^{+2.8}_{-2.7}$            | $k_D$                       | 0.14008  | $0.1404^{+0.0033}_{-0.0032}$    | $\chi_{\text{CamSpec}}^2$   | 7050.1   | $7063.8 (\nu: 14.9)$       |
| $\Omega_\Lambda$                     | 0.6934   | $0.691^{+0.015}_{-0.015}$       | $100\theta_D$               | 0.16094  | $0.1610^{+0.0012}_{-0.0011}$    | $\chi_{\text{JLA}}^2$       | 1034.86  | $1035.05 (\nu: 0.1)$       |
| $\Omega_m$                           | 0.3066   | $0.309^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | 3384     | $3376^{+58}_{-57}$              | $\chi_{\text{6DF}}^2$       | 0.003    | $0.049 (\nu: 0.0)$         |
| $\Omega_m h^2$                       | 0.1409   | $0.1420^{+0.0081}_{-0.0077}$    | $k_{\text{eq}}$             | 0.010301 | $0.01031^{+0.00027}_{-0.00027}$ | $\chi_{\text{MGS}}^2$       | 1.54     | $1.47 (\nu: 0.1)$          |
| $\Omega_\nu h^2$                     | 0.00001  | < 0.00139                       | $100\theta_{\text{eq}}$     | 0.8161   | $0.818^{+0.011}_{-0.011}$       | $\chi_{\text{DR12BAO}}^2$   | 3.65     | $4.5 (\nu: 1.0)$           |
| $\Omega_m h^3$                       | 0.0955   | $0.0964^{+0.0091}_{-0.0085}$    | $100\theta_{s,\text{eq}}$   | 0.4510   | $0.4518^{+0.0056}_{-0.0054}$    | $\chi_{\text{prior}}^2$     | 2.2      | $7.6 (\nu: 5.9)$           |
| $\sigma_8$                           | 0.8187   | $0.813^{+0.025}_{-0.025}$       | $H(0.15)$                   | 73.00    | $73.1^{+2.8}_{-2.7}$            | $\chi_{\text{CMB}}^2$       | 7478.0   | $7493.5 (\nu: 16.0)$       |
| $S_8$                                | 0.8277   | $0.824^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | 639.9    | $640^{+25}_{-25}$               | $\chi_{\text{BAO}}^2$       | 5.20     | $6.0 (\nu: 0.6)$           |

Best-fit  $\chi_{\text{eff}}^2 = 8520.27$ ;  $\Delta\chi_{\text{eff}}^2 = -1.61$ ;  $\bar{\chi}_{\text{eff}}^2 = 8542.17$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.67$ ;  $R - 1 = 0.00504$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 ( $\Delta$  -0.02) MGS: 1.54 ( $\Delta$  0.26) DR12BAO: 3.65 ( $\Delta$  -0.53) CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp-p.teb.consext8: 8.87 ( $\Delta$  -0.15) small\_100x143\_offlike5\_EE\_Aplanc  
395.85 ( $\Delta$  -0.38) commander\_dx12\_v3.2.29: 23.25 ( $\Delta$  0.40) CamSpec like\_10.7HM: 7050.07 ( $\Delta$  -1.10) SN - JLA Pantheon18: 1034.86 ( $\Delta$  -0.14)



# 8.17 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_BAO\_post\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022135 | $0.02219^{+0.00043}_{-0.00042}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4536   | $0.452^{+0.014}_{-0.014}$       | $H(0.38)$                   | 82.61    | $82.7^{+2.4}_{-2.3}$         |
| $\Omega_c h^2$                       | 0.1180   | $0.1183^{+0.0061}_{-0.0059}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6086   | $0.605^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | 1535.5   | $1536^{+48}_{-48}$           |
| $100\theta_{MC}$                     | 1.04120  | $1.0411^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$          | 0.9947   | $0.987^{+0.021}_{-0.024}$       | $H(0.51)$                   | 89.25    | $89.4^{+2.5}_{-2.4}$         |
| $\tau$                               | 0.0529   | $0.055^{+0.016}_{-0.014}$       | $r_{\text{drag}} h$         | 99.98    | $99.7^{+1.9}_{-1.9}$            | $D_M(0.51)$                 | 1990     | $1989^{+61}_{-61}$           |
| $\Sigma m_\nu$ [eV]                  | 0.001    | $< 0.127$                       | $\langle d^2 \rangle^{1/2}$ | 2.4437   | $2.436^{+0.045}_{-0.045}$       | $H(0.61)$                   | 94.82    | $94.9^{+2.6}_{-2.5}$         |
| $N_{\text{eff}}$                     | 2.953    | $2.99^{+0.37}_{-0.35}$          | $z_{\text{re}}$             | 7.54     | $7.7^{+1.5}_{-1.5}$             | $D_M(0.61)$                 | 2316     | $2315^{+70}_{-69}$           |
| $\ln(10^{10} A_s)$                   | 3.0338   | $3.039^{+0.034}_{-0.032}$       | $10^9 A_s$                  | 2.078    | $2.089^{+0.071}_{-0.066}$       | $H(2.33)$                   | 234.4    | $235.0^{+5.4}_{-5.2}$        |
| $n_s$                                | 0.9628   | $0.965^{+0.014}_{-0.014}$       | $10^9 A_s e^{-2\tau}$       | 1.8690   | $1.872^{+0.034}_{-0.034}$       | $D_M(2.33)$                 | 5795     | $5787^{+150}_{-150}$         |
| $y_{\text{cal}}$                     | 1.00022  | $1.0006^{+0.0048}_{-0.0048}$    | $D_{40}$                    | 1228.0   | $1227^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4577   | $0.456^{+0.013}_{-0.013}$    |
| $A_{100}^{\text{PS}}$                | 239.2    | $241^{+50}_{-50}$               | $D_{220}$                   | 5705     | $5713^{+76}_{-79}$              | $\sigma_8(0.15)$            | 0.7547   | $0.749^{+0.021}_{-0.022}$    |
| $A_{143}^{\text{PS}}$                | 38.0     | $40^{+20}_{-20}$                | $D_{810}$                   | 2529.9   | $2533^{+26}_{-27}$              | $f\sigma_8(0.38)$           | 0.4766   | $0.475^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | 99.8     | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.4    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6691   | $0.664^{+0.019}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | 44.5     | $40^{+10}_{-10}$                | $D_{2000}$                  | 230.13   | $230.3^{+4.1}_{-4.1}$           | $f\sigma_8(0.51)$           | 0.4755   | $0.473^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | 5.75     | $< 7.40$                        | $n_{s,0.002}$               | 0.9628   | $0.965^{+0.014}_{-0.014}$       | $\sigma_8(0.51)$            | 0.6262   | $0.621^{+0.018}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.568    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.24405  | $0.2446^{+0.0049}_{-0.0049}$    | $f\sigma_8(0.61)$           | 0.4707   | $0.468^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.74     | —                               | $Y_P^{\text{BBN}}$          | 0.24537  | $0.2459^{+0.0050}_{-0.0050}$    | $\sigma_8(0.61)$            | 0.5958   | $0.591^{+0.018}_{-0.018}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.04     | —                               | $10^5 D/H$                  | 2.598    | $2.60^{+0.12}_{-0.11}$          | $f\sigma_8(2.33)$           | 0.2996   | $0.2979^{+0.0088}_{-0.0088}$ |
| $A^{\text{kSZ}}$                     | 1.4      | —                               | Age/Gyr                     | 13.873   | $13.85^{+0.36}_{-0.35}$         | $\sigma_8(2.33)$            | 0.3094   | $0.3072^{+0.0097}_{-0.0098}$ |
| $A_{100}^{\text{dust}}$              | 1.010    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1089.94  | $1089.95^{+0.82}_{-0.81}$       | $f_{2000}^{143}$            | 30.4     | $30^{+7}_{-7}$               |
| $A_{143}^{\text{dust}}$              | 0.992    | $0.97^{+0.34}_{-0.34}$          | $r_*$                       | 145.61   | $145.3^{+3.5}_{-3.5}$           | $f_{2000}^{217}$            | 106.97   | $107.0^{+4.5}_{-4.3}$        |
| $A_{217}^{\text{dust}}$              | 0.961    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04143  | $1.0413^{+0.0012}_{-0.0012}$    | $f_{2000}^{143 \times 217}$ | 32.31    | $32^{+5}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 0.9998   | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.982   | $13.95^{+0.32}_{-0.32}$         | $\chi^2_{\text{lensing}}$   | 8.80     | $9.41 (\nu: 0.4)$            |
| $c_{100}$                            | 0.99755  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.17  | $1059.3^{+1.4}_{-1.4}$          | $\chi^2_{\text{small}}$     | 395.86   | $397.1 (\nu: 1.7)$           |
| $c_{217}$                            | 1.00120  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | 148.37   | $148.1^{+3.6}_{-3.6}$           | $\chi^2_{\text{lowl}}$      | 23.49    | $23.3 (\nu: 0.7)$            |
| $H_0$                                | 67.39    | $67.4^{+2.4}_{-2.3}$            | $k_D$                       | 0.13970  | $0.1399^{+0.0026}_{-0.0026}$    | $\chi^2_{\text{CamSpec}}$   | 7050.0   | $7063.3 (\nu: 14.2)$         |
| $\Omega_\Lambda$                     | 0.6914   | $0.689^{+0.015}_{-0.016}$       | $100\theta_D$               | 0.16084  | $0.16089^{+0.00096}_{-0.00095}$ | $\chi^2_{\text{Aver15}}$    | 0.01     | $0.45 (\nu: 0.2)$            |
| $\Omega_m$                           | 0.3086   | $0.311^{+0.016}_{-0.015}$       | $z_{\text{eq}}$             | 3391     | $3383^{+56}_{-55}$              | $\chi^2_{6\text{DF}}$       | 0.010    | $0.064 (\nu: 0.0)$           |
| $\Omega_m h^2$                       | 0.1401   | $0.1410^{+0.0064}_{-0.0062}$    | $k_{\text{eq}}$             | 0.010284 | $0.01029^{+0.00023}_{-0.00023}$ | $\chi^2_{\text{MGS}}$       | 1.41     | $1.33 (\nu: 0.1)$            |
| $\Omega_\nu h^2$                     | 0.00001  | $< 0.00135$                     | $100\theta_{\text{eq}}$     | 0.8148   | $0.816^{+0.011}_{-0.010}$       | $\chi^2_{\text{DR12BAO}}$   | 3.87     | $4.8 (\nu: 1.5)$             |
| $\Omega_m h^3$                       | 0.0944   | $0.0950^{+0.0072}_{-0.0067}$    | $100\theta_{s,\text{eq}}$   | 0.4503   | $0.4511^{+0.0054}_{-0.0053}$    | $\chi^2_{\text{prior}}$     | 2.1      | $7.5 (\nu: 5.9)$             |
| $\sigma_8$                           | 0.8166   | $0.810^{+0.022}_{-0.023}$       | $H(0.15)$                   | 72.61    | $72.6^{+2.4}_{-2.3}$            | $\chi^2_{\text{CMB}}$       | 7478.1   | $7493.1 (\nu: 15.4)$         |
| $S_8$                                | 0.8282   | $0.825^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | 643.5    | $644^{+21}_{-21}$               | $\chi^2_{\text{BAO}}$       | 5.29     | $6.2 (\nu: 1.0)$             |

Best-fit  $\chi^2_{\text{eff}} = 7485.47$ ;  $\bar{\chi}^2_{\text{eff}} = 7507.32$ ;  $R - 1 = 0.00578$   
 $\chi^2_{\text{eff}}$ : Abund - Yp\_Aver2015: 0.01 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.88 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 8.80 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.86 commander\_dx12\_v3\_2\_29: 23.49 CamSpec like\_10.7HM: 7049.95



# 8.18 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_BAO\_post\_Cooke17\_Aver15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022159 | $0.02218^{+0.00042}_{-0.00042}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6086   | $0.605^{+0.015}_{-0.016}$       | $H(0.51)$                   | 89.40    | $89.4^{+2.3}_{-2.3}$         |
| $\Omega_c h^2$              | 0.1182   | $0.1185^{+0.0055}_{-0.0053}$    | $\sigma_8/h^{0.5}$          | 0.9943   | $0.987^{+0.021}_{-0.024}$       | $D_M(0.51)$                 | 1986     | $1988^{+58}_{-58}$           |
| $100\theta_{MC}$            | 1.04111  | $1.04109^{+0.00097}_{-0.00098}$ | $r_{drag}h$                 | 100.09   | $99.7^{+1.9}_{-1.9}$            | $H(0.61)$                   | 94.97    | $95.0^{+2.4}_{-2.3}$         |
| $\tau$                      | 0.0530   | $0.055^{+0.016}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | 2.4415   | $2.436^{+0.045}_{-0.045}$       | $D_M(0.61)$                 | 2311     | $2313^{+67}_{-66}$           |
| $\Sigma m_\nu$ [eV]         | 0.002    | $< 0.128$                       | $z_{re}$                    | 7.55     | $7.7^{+1.5}_{-1.5}$             | $H(2.33)$                   | 234.59   | $235.2^{+4.9}_{-4.9}$        |
| $N_{eff}$                   | 2.973    | $3.00^{+0.34}_{-0.33}$          | $10^9 A_s$                  | 2.080    | $2.090^{+0.071}_{-0.066}$       | $D_M(2.33)$                 | 5786     | $5783^{+140}_{-140}$         |
| $\ln(10^{10} A_s)$          | 3.0351   | $3.039^{+0.033}_{-0.032}$       | $10^9 A_s e^{-2\tau}$       | 1.8711   | $1.873^{+0.033}_{-0.033}$       | $f\sigma_8(0.15)$           | 0.4574   | $0.456^{+0.013}_{-0.013}$    |
| $n_s$                       | 0.9638   | $0.965^{+0.014}_{-0.014}$       | $D_{40}$                    | 1227.1   | $1227^{+26}_{-27}$              | $\sigma_8(0.15)$            | 0.7554   | $0.749^{+0.020}_{-0.022}$    |
| $y_{cal}$                   | 1.00059  | $1.0006^{+0.0048}_{-0.0048}$    | $D_{220}$                   | 5709     | $5712^{+75}_{-78}$              | $f\sigma_8(0.38)$           | 0.4766   | $0.475^{+0.012}_{-0.012}$    |
| $A_{100}^{PS}$              | 237.8    | $242^{+50}_{-50}$               | $D_{810}$                   | 2531.7   | $2533^{+26}_{-27}$              | $\sigma_8(0.38)$            | 0.6698   | $0.664^{+0.019}_{-0.020}$    |
| $A_{143}^{PS}$              | 37.8     | $40^{+20}_{-20}$                | $D_{1420}$                  | 814.9    | $815.2^{+9.7}_{-9.8}$           | $f\sigma_8(0.51)$           | 0.4756   | $0.473^{+0.011}_{-0.012}$    |
| $A_{217}^{PS}$              | 99.2     | $101^{+30}_{-30}$               | $D_{2000}$                  | 230.21   | $230.2^{+3.8}_{-3.8}$           | $\sigma_8(0.51)$            | 0.6269   | $0.621^{+0.018}_{-0.019}$    |
| $A_{217}^{CIB}$             | 45.2     | $40^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9638   | $0.965^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | 0.4708   | $0.469^{+0.011}_{-0.012}$    |
| $A_{143}^{tSZ}$             | 6.05     | $< 7.39$                        | $Y_P$                       | 0.24433  | $0.2447^{+0.0046}_{-0.0046}$    | $\sigma_8(0.61)$            | 0.5965   | $0.591^{+0.017}_{-0.018}$    |
| $r_{143 \times 217}^{PS}$   | 0.542    | $0.65^{+0.25}_{-0.25}$          | $Y_P^{BBN}$                 | 0.24565  | $0.2460^{+0.0046}_{-0.0046}$    | $f\sigma_8(2.33)$           | 0.3000   | $0.2980^{+0.0085}_{-0.0086}$ |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | $10^5 D/H$                  | 2.600    | $2.606^{+0.098}_{-0.097}$       | $\sigma_8(2.33)$            | 0.3099   | $0.3073^{+0.0094}_{-0.0097}$ |
| $\xi^{tSZ \times CIB}$      | 0.01     | —                               | Age/Gyr                     | 13.853   | $13.85^{+0.34}_{-0.33}$         | $f_{2000}^{143}$            | 30.4     | $30^{+6}_{-6}$               |
| $A^{kSZ}$                   | 1.1      | —                               | $z_*$                       | 1089.95  | $1089.98^{+0.71}_{-0.70}$       | $f_{2000}^{217}$            | 107.02   | $107.1^{+4.2}_{-4.2}$        |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | 145.44   | $145.2^{+3.3}_{-3.2}$           | $f_{2000}^{143 \times 217}$ | 32.25    | $32^{+5}_{-4}$               |
| $A_{143}^{dust}$            | 0.995    | $0.97^{+0.34}_{-0.34}$          | $100\theta_*$               | 1.04133  | $1.0413^{+0.0011}_{-0.0011}$    | $\chi^2_{lensing}$          | 8.82     | $9.42 (\nu: 0.4)$            |
| $A_{217}^{dust}$            | 0.963    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.967   | $13.95^{+0.30}_{-0.30}$         | $\chi^2_{small}$            | 395.85   | $397.0 (\nu: 1.7)$           |
| $A_{143 \times 217}^{dust}$ | 0.982    | $1.03^{+0.32}_{-0.32}$          | $z_{drag}$                  | 1059.25  | $1059.3^{+1.4}_{-1.4}$          | $\chi^2_{lowl}$             | 23.32    | $23.3 (\nu: 0.6)$            |
| $c_{100}$                   | 0.99752  | $0.9975^{+0.0021}_{-0.0021}$    | $r_{drag}$                  | 148.19   | $148.0^{+3.4}_{-3.3}$           | $\chi^2_{CamSpec}$          | 7050.0   | $7063.1 (\nu: 13.8)$         |
| $c_{217}$                   | 1.00128  | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | 0.13983  | $0.1400^{+0.0025}_{-0.0025}$    | $\chi^2_{Aver15}$           | 0.04     | $0.41 (\nu: 0.2)$            |
| $H_0$                       | 67.54    | $67.4^{+2.3}_{-2.2}$            | $100\theta_D$               | 0.16086  | $0.16093^{+0.00083}_{-0.00083}$ | $\chi^2_{Cooke17}$          | 0.04     | $0.29 (\nu: 0.1)$            |
| $\Omega_\Lambda$            | 0.6923   | $0.689^{+0.015}_{-0.016}$       | $z_{eq}$                    | 3387     | $3382^{+56}_{-54}$              | $\chi^2_{6DF}$              | 0.006    | $0.064 (\nu: 0.0)$           |
| $\Omega_m$                  | 0.3077   | $0.311^{+0.016}_{-0.015}$       | $k_{eq}$                    | 0.010286 | $0.01029^{+0.00022}_{-0.00022}$ | $\chi^2_{MGS}$              | 1.47     | $1.33 (\nu: 0.1)$            |
| $\Omega_m h^2$              | 0.1404   | $0.1412^{+0.0059}_{-0.0057}$    | $100\theta_{eq}$            | 0.8155   | $0.816^{+0.010}_{-0.010}$       | $\chi^2_{DR12BAO}$          | 3.76     | $4.8 (\nu: 1.5)$             |
| $\Omega_\nu h^2$            | 0.00003  | $< 0.00136$                     | $100\theta_{s,eq}$          | 0.4507   | $0.4512^{+0.0053}_{-0.0052}$    | $\chi^2_{prior}$            | 2.2      | $7.6 (\nu: 5.9)$             |
| $\Omega_m h^3$              | 0.0948   | $0.0952^{+0.0067}_{-0.0064}$    | $H(0.15)$                   | 72.76    | $72.7^{+2.2}_{-2.2}$            | $\chi^2_{CMB}$              | 7478.0   | $7492.9 (\nu: 14.9)$         |
| $\sigma_8$                  | 0.8172   | $0.810^{+0.021}_{-0.023}$       | $D_M(0.15)$                 | 642.1    | $643^{+20}_{-20}$               | $\chi^2_{BAO}$              | 5.24     | $6.2 (\nu: 1.0)$             |
| $S_8$                       | 0.8276   | $0.825^{+0.024}_{-0.024}$       | $H(0.38)$                   | 82.76    | $82.7^{+2.3}_{-2.2}$            | $\chi^2_{Abund}$            | 0.07     | $0.70 (\nu: 0.3)$            |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4533   | $0.452^{+0.013}_{-0.013}$       | $D_M(0.38)$                 | 1532.3   | $1534^{+46}_{-46}$              |                             |          |                              |

Best-fit  $\chi^2_{eff} = 7485.51$ ;  $\bar{\chi}^2_{eff} = 7507.35$ ;  $R - 1 = 0.00593$   
 $\chi^2_{eff}$ : Abund - Yp\_Aver2015: 0.04 D.Cooke2017: 0.04 BAO - 6DF: 0.01 MGS: 1.47 DR12BAO: 3.76 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.82  
small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12\_v3.2\_29: 23.32 CamSpec like\_10.7HM: 7049.98



# 8.19 base\_nnu\_mnu\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02224^{+0.00044}_{-0.00045}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.452^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.2^{+3.0}_{-2.9}$         |
| $\Omega_{\mathrm{c}}h^2$               | $0.1192^{+0.0076}_{-0.0073}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1526^{+58}_{-57}$           |
| $100\theta_{\mathrm{MC}}$              | $1.0410^{+0.0011}_{-0.0011}$    | $\sigma_8/h^{0.5}$                   | $0.987^{+0.022}_{-0.023}$       | $H(0.51)$                   | $89.9^{+3.1}_{-3.0}$         |
| $\tau$                                 | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}}h$                 | $100.0^{+1.9}_{-1.8}$           | $D_{\mathrm{M}}(0.51)$      | $1977^{+73}_{-72}$           |
| $\Sigma m_{\nu} [\mathrm{eV}]$         | $< 0.132$                       | $\langle d^2 \rangle^{1/2}$          | $2.433^{+0.046}_{-0.046}$       | $H(0.61)$                   | $95.5^{+3.2}_{-3.1}$         |
| $N_{\mathrm{eff}}$                     | $3.06^{+0.47}_{-0.44}$          | $z_{\mathrm{re}}$                    | $< 9.04$                        | $D_{\mathrm{M}}(0.61)$      | $2301^{+84}_{-83}$           |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.044^{+0.035}_{-0.031}$       | $10^9 A_{\mathrm{s}}$                | $2.099^{+0.071}_{-0.067}$       | $H(2.33)$                   | $235.9^{+6.8}_{-6.6}$        |
| $n_{\mathrm{s}}$                       | $0.967^{+0.017}_{-0.017}$       | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.877^{+0.040}_{-0.041}$       | $D_{\mathrm{M}}(2.33)$      | $5758^{+180}_{-180}$         |
| $y_{\mathrm{cal}}$                     | $1.0006^{+0.0048}_{-0.0049}$    | $D_{40}$                             | $1224^{+28}_{-28}$              | $f\sigma_8(0.15)$           | $0.456^{+0.013}_{-0.013}$    |
| $A_{100}^{\mathrm{PS}}$                | $242^{+50}_{-50}$               | $D_{220}$                            | $5713^{+76}_{-79}$              | $\sigma_8(0.15)$            | $0.752^{+0.024}_{-0.024}$    |
| $A_{143}^{\mathrm{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                            | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                           | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.666^{+0.022}_{-0.022}$    |
| $A_{217}^{\mathrm{CIB}}$               | $41^{+10}_{-10}$                | $D_{2000}$                           | $229.9^{+4.5}_{-4.4}$           | $f\sigma_8(0.51)$           | $0.474^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.38$                        | $n_{\mathrm{s},0.002}$               | $0.967^{+0.017}_{-0.017}$       | $\sigma_8(0.51)$            | $0.624^{+0.020}_{-0.021}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                     | $0.2455^{+0.0062}_{-0.0062}$    | $f\sigma_8(0.61)$           | $0.470^{+0.013}_{-0.013}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.2468^{+0.0062}_{-0.0062}$    | $\sigma_8(0.61)$            | $0.594^{+0.020}_{-0.020}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.62^{+0.13}_{-0.13}$          | $f\sigma_8(2.33)$           | $0.2994^{+0.0099}_{-0.0097}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.79^{+0.44}_{-0.43}$         | $\sigma_8(2.33)$            | $0.309^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                                | $1090.03^{+0.95}_{-0.93}$       | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\mathrm{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $r_*$                                | $144.7^{+4.4}_{-4.3}$           | $f_{2000}^{217}$            | $107.4^{+4.7}_{-4.6}$        |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                        | $1.0412^{+0.0014}_{-0.0013}$    | $f_{2000}^{143\times 217}$  | $33^{+5}_{-5}$               |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.33}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.90^{+0.41}_{-0.40}$         | $\chi_{\mathrm{lensing}}^2$ | $9.52 (\nu: 0.4)$            |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                  | $1059.6^{+1.7}_{-1.7}$          | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.8)$           |
| $c_{217}$                              | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                  | $147.4^{+4.5}_{-4.5}$           | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 0.7)$            |
| $H_0$                                  | $67.8^{+2.8}_{-2.7}$            | $k_{\mathrm{D}}$                     | $0.1404^{+0.0033}_{-0.0032}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7063.8 (\nu: 14.9)$         |
| $\Omega_{\Lambda}$                     | $0.691^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{D}}$             | $0.1610^{+0.0012}_{-0.0011}$    | $\chi_{\mathrm{JLA}}^2$     | $1035.04 (\nu: 0.1)$         |
| $\Omega_{\mathrm{m}}$                  | $0.309^{+0.015}_{-0.015}$       | $z_{\mathrm{eq}}$                    | $3374^{+57}_{-57}$              | $\chi_{6\mathrm{DF}}^2$     | $0.047 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}h^2$               | $0.1420^{+0.0081}_{-0.0077}$    | $k_{\mathrm{eq}}$                    | $0.01031^{+0.00027}_{-0.00027}$ | $\chi_{\mathrm{MGS}}^2$     | $1.48 (\nu: 0.1)$            |
| $\Omega_{\nu}h^2$                      | $< 0.00140$                     | $100\theta_{\mathrm{eq}}$            | $0.818^{+0.011}_{-0.010}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $4.5 (\nu: 0.9)$             |
| $\Omega_{\mathrm{m}}h^3$               | $0.0964^{+0.0091}_{-0.0085}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4520^{+0.0056}_{-0.0053}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.0)$             |
| $\sigma_8$                             | $0.813^{+0.025}_{-0.025}$       | $H(0.15)$                            | $73.1^{+2.8}_{-2.7}$            | $\chi_{\mathrm{CMB}}^2$     | $7493.4 (\nu: 15.9)$         |
| $S_8$                                  | $0.824^{+0.025}_{-0.025}$       | $D_{\mathrm{M}}(0.15)$               | $639^{+25}_{-25}$               | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.6)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8542.04; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.69; R - 1 = 0.00589$$



## 8.20 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022261 | $0.02228^{+0.00038}_{-0.00037}$ | $S_8$                       | 0.8250   | $0.822^{+0.022}_{-0.022}$       | $H(0.38)$                   | 82.32    | $82.6^{+2.7}_{-2.5}$         |
| $\Omega_c h^2$                       | 0.1168   | $0.1178^{+0.0065}_{-0.0061}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4519   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1541     | $1537^{+53}_{-53}$           |
| $100\theta_{MC}$                     | 1.04121  | $1.04111^{+0.00092}_{-0.00092}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6064   | $0.603^{+0.015}_{-0.016}$       | $H(0.51)$                   | 88.94    | $89.2^{+2.8}_{-2.6}$         |
| $\tau$                               | 0.0531   | $0.054^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9929   | $0.985^{+0.020}_{-0.023}$       | $D_M(0.51)$                 | 1996     | $1992^{+67}_{-67}$           |
| $\Sigma m_\nu$ [eV]                  | 0.001    | < 0.129                         | $r_{\text{drag}} h$         | 99.99    | $99.7^{+1.8}_{-1.8}$            | $H(0.61)$                   | 94.48    | $94.8^{+2.8}_{-2.7}$         |
| $N_{\text{eff}}$                     | 2.889    | $2.96^{+0.41}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$ | 2.4431   | $2.435^{+0.043}_{-0.044}$       | $D_M(0.61)$                 | 2324     | $2318^{+76}_{-76}$           |
| $\ln(10^{10} A_s)$                   | 3.0331   | $3.038^{+0.035}_{-0.033}$       | $z_{\text{re}}$             | 7.51     | $7.7^{+1.5}_{-1.5}$             | $H(2.33)$                   | 233.5    | $234.7^{+5.9}_{-5.6}$        |
| $n_s$                                | 0.9621   | $0.964^{+0.015}_{-0.015}$       | $10^9 A_s$                  | 2.076    | $2.087^{+0.073}_{-0.069}$       | $D_M(2.33)$                 | 5815     | $5794^{+160}_{-160}$         |
| $y_{\text{cal}}$                     | 1.00066  | $1.0007^{+0.0048}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | 1.8669   | $1.871^{+0.036}_{-0.036}$       | $f\sigma_8(0.15)$           | 0.4559   | $0.455^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{PS}}$                | 226.8    | $238^{+50}_{-50}$               | $D_{40}$                    | 1230.5   | $1229^{+26}_{-27}$              | $\sigma_8(0.15)$            | 0.7521   | $0.747^{+0.022}_{-0.023}$    |
| $A_{143}^{\text{PS}}$                | 45.8     | $38^{+20}_{-20}$                | $D_{220}$                   | 5725     | $5725^{+74}_{-74}$              | $f\sigma_8(0.38)$           | 0.4749   | $0.473^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | 105.8    | $103^{+30}_{-30}$               | $D_{810}$                   | 2534.8   | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | 0.6668   | $0.662^{+0.020}_{-0.021}$    |
| $A_{217}^{\text{CIB}}$               | 41.1     | $39^{+10}_{-10}$                | $D_{1420}$                  | 818.0    | $816.8^{+9.7}_{-9.8}$           | $f\sigma_8(0.51)$           | 0.4737   | $0.472^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | 6.50     | < 7.52                          | $D_{2000}$                  | 231.81   | $231.0^{+4.0}_{-4.0}$           | $\sigma_8(0.51)$            | 0.6240   | $0.620^{+0.019}_{-0.020}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.715    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9621   | $0.964^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | 0.4690   | $0.467^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.84     | —                               | $Y_{\text{P}}$              | 0.2432   | $0.2442^{+0.0055}_{-0.0054}$    | $\sigma_8(0.61)$            | 0.5938   | $0.590^{+0.018}_{-0.019}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.69     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2445   | $0.2455^{+0.0055}_{-0.0054}$    | $f\sigma_8(2.33)$           | 0.2985   | $0.2972^{+0.0093}_{-0.0093}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.552    | $2.57^{+0.11}_{-0.10}$          | $\sigma_8(2.33)$            | 0.3084   | $0.307^{+0.010}_{-0.010}$    |
| $A_{100}^{\text{dust}}$              | 0.9995   | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | 13.923   | $13.87^{+0.39}_{-0.39}$         | $f_{2000}^{143}$            | 28.3     | $29^{+7}_{-6}$               |
| $A_{143}^{\text{dust}}$              | 0.973    | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | 1089.62  | $1089.75^{+0.78}_{-0.75}$       | $f_{2000}^{217}$            | 105.51   | $106.3^{+4.4}_{-4.3}$        |
| $A_{217}^{\text{dust}}$              | 0.983    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 146.15   | $145.5^{+3.8}_{-3.8}$           | $f_{2000}^{143 \times 217}$ | 30.75    | $31^{+5}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 1.001    | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04148  | $1.0414^{+0.0011}_{-0.0011}$    | $\chi_{\text{lensing}}^2$   | 8.62     | $9.27 (\nu: 0.3)$            |
| $c_{100}$                            | 0.99780  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 14.033   | $13.97^{+0.35}_{-0.35}$         | $\chi_{\text{small}}^2$     | 395.85   | $397.0 (\nu: 1.4)$           |
| $c_{217}$                            | 1.00113  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.32  | $1059.5^{+1.5}_{-1.4}$          | $\chi_{\text{lowl}}^2$      | 23.58    | $23.4 (\nu: 0.7)$            |
| $c_{TE}$                             | 0.9954   | $0.996^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | 148.88   | $148.2^{+4.0}_{-4.0}$           | $\chi_{\text{CamSpec}}^2$   | 11498.2  | $11514.1 (\nu: 16.3)$        |
| $c_{EE}$                             | 0.9901   | $0.991^{+0.011}_{-0.011}$       | $k_{\text{D}}$              | 0.13952  | $0.1400^{+0.0029}_{-0.0028}$    | $\chi_{6\text{DF}}^2$       | 0.010    | $0.059 (\nu: 0.0)$           |
| $H_0$                                | 67.16    | $67.3^{+2.6}_{-2.4}$            | $100\theta_{\text{D}}$      | 0.16045  | $0.16066^{+0.00098}_{-0.00093}$ | $\chi_{\text{MGS}}^2$       | 1.41     | $1.33 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | 0.6916   | $0.689^{+0.014}_{-0.015}$       | $z_{\text{eq}}$             | 3395     | $3386^{+51}_{-52}$              | $\chi_{\text{DR12BAO}}^2$   | 3.90     | $4.8 (\nu: 1.3)$             |
| $\Omega_{\text{m}}$                  | 0.3084   | $0.311^{+0.015}_{-0.014}$       | $k_{\text{eq}}$             | 0.010252 | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{prior}}^2$     | 2.0      | $7.8 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^2$              | 0.1391   | $0.1406^{+0.0069}_{-0.0065}$    | $100\theta_{\text{eq}}$     | 0.8143   | $0.816^{+0.010}_{-0.0096}$      | $\chi_{\text{CMB}}^2$       | 11926.3  | $11943.7 (\nu: 17.3)$        |
| $\Omega_\nu h^2$                     | 0.00001  | < 0.00136                       | $100\theta_{s,\text{eq}}$   | 0.44999  | $0.4509^{+0.0051}_{-0.0049}$    | $\chi_{\text{BAO}}^2$       | 5.31     | $6.2 (\nu: 0.9)$             |
| $\Omega_{\text{m}} h^3$              | 0.0934   | $0.0947^{+0.0079}_{-0.0073}$    | $H(0.15)$                   | 72.36    | $72.5^{+2.6}_{-2.5}$            |                             |          |                              |
| $\sigma_8$                           | 0.8137   | $0.808^{+0.023}_{-0.024}$       | $D_M(0.15)$                 | 645.7    | $645^{+23}_{-23}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11933.58$ ;  $\bar{\chi}_{\text{eff}}^2 = 11957.66$ ;  $\Delta\chi_{\text{eff}}^2 = 0.26$ ;  $R - 1 = 0.00614$

$\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.90 CMB - smicadx12\_Dec5.ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.62 small\_100x143.offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12.v3.2.29: 23.58 CamSpec like\_10.7HM.1400\_unified: 11498.22



## 8.21 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022256 | $0.02230^{+0.00037}_{-0.00037}$ | $S_8$                       | 0.8240   | $0.822^{+0.022}_{-0.022}$       | $H(0.38)$                   | 82.43    | $82.7^{+2.6}_{-2.5}$         |
| $\Omega_c h^2$                       | 0.1169   | $0.1180^{+0.0065}_{-0.0062}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4513   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1538     | $1534^{+51}_{-51}$           |
| $100\theta_{MC}$                     | 1.04122  | $1.04109^{+0.00091}_{-0.00091}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6061   | $0.603^{+0.015}_{-0.015}$       | $H(0.51)$                   | 89.05    | $89.4^{+2.7}_{-2.6}$         |
| $\tau$                               | 0.0532   | $0.055^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9922   | $0.985^{+0.020}_{-0.023}$       | $D_M(0.51)$                 | 1993     | $1988^{+65}_{-65}$           |
| $\Sigma m_\nu$ [eV]                  | 0.001    | < 0.122                         | $r_{\text{drag}} h$         | 100.10   | $99.9^{+1.7}_{-1.7}$            | $H(0.61)$                   | 94.58    | $95.0^{+2.8}_{-2.7}$         |
| $N_{\text{eff}}$                     | 2.903    | $2.98^{+0.40}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$ | 2.4400   | $2.434^{+0.042}_{-0.044}$       | $D_M(0.61)$                 | 2320     | $2313^{+74}_{-75}$           |
| $\ln(10^{10} A_s)$                   | 3.0331   | $3.039^{+0.034}_{-0.033}$       | $z_{\text{re}}$             | 7.52     | $7.7^{+1.5}_{-1.5}$             | $H(2.33)$                   | 233.6    | $234.8^{+5.8}_{-5.6}$        |
| $n_s$                                | 0.9629   | $0.965^{+0.015}_{-0.014}$       | $10^9 A_s$                  | 2.076    | $2.088^{+0.072}_{-0.069}$       | $D_M(2.33)$                 | 5810     | $5787^{+160}_{-160}$         |
| $y_{\text{cal}}$                     | 1.00048  | $1.0007^{+0.0048}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | 1.8665   | $1.872^{+0.036}_{-0.036}$       | $f\sigma_8(0.15)$           | 0.4554   | $0.455^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | 228.2    | $238^{+50}_{-50}$               | $D_{40}$                    | 1228.3   | $1228^{+26}_{-26}$              | $\sigma_8(0.15)$            | 0.7523   | $0.748^{+0.021}_{-0.022}$    |
| $A_{143}^{\text{PS}}$                | 42.6     | $38^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5726^{+74}_{-74}$              | $f\sigma_8(0.38)$           | 0.4746   | $0.473^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | 104.7    | $103^{+30}_{-30}$               | $D_{810}$                   | 2533.7   | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | 0.6671   | $0.663^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | 41.7     | $39^{+10}_{-10}$                | $D_{1420}$                  | 817.5    | $816.7^{+9.8}_{-9.8}$           | $f\sigma_8(0.51)$           | 0.4736   | $0.472^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | 6.47     | < 7.52                          | $D_{2000}$                  | 231.58   | $231.0^{+4.0}_{-4.0}$           | $\sigma_8(0.51)$            | 0.6244   | $0.621^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.680    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9629   | $0.965^{+0.015}_{-0.014}$       | $f\sigma_8(0.61)$           | 0.4689   | $0.467^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.79     | —                               | $Y_{\text{P}}$              | 0.2434   | $0.2444^{+0.0055}_{-0.0053}$    | $\sigma_8(0.61)$            | 0.5941   | $0.591^{+0.018}_{-0.019}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.47     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.2447   | $0.2457^{+0.0055}_{-0.0053}$    | $f\sigma_8(2.33)$           | 0.2988   | $0.2977^{+0.0091}_{-0.0090}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.557    | $2.58^{+0.11}_{-0.10}$          | $\sigma_8(2.33)$            | 0.3086   | $0.3071^{+0.0099}_{-0.010}$  |
| $A_{100}^{\text{dust}}$              | 1.006    | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | 13.909   | $13.86^{+0.38}_{-0.39}$         | $f_{2000}^{143}$            | 28.4     | $29^{+7}_{-6}$               |
| $A_{143}^{\text{dust}}$              | 0.967    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.65  | $1089.76^{+0.78}_{-0.75}$       | $f_{2000}^{217}$            | 105.61   | $106.4^{+4.4}_{-4.3}$        |
| $A_{217}^{\text{dust}}$              | 0.982    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 146.06   | $145.4^{+3.8}_{-3.8}$           | $f_{2000}^{143 \times 217}$ | 30.84    | $31^{+5}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 1.011    | $1.03^{+0.33}_{-0.32}$          | $100\theta_*$               | 1.04147  | $1.0413^{+0.0011}_{-0.0011}$    | $\chi_{\text{lensing}}^2$   | 8.66     | $9.30 (\nu: 0.3)$            |
| $c_{100}$                            | 0.99774  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 14.024   | $13.96^{+0.35}_{-0.35}$         | $\chi_{\text{small}}^2$     | 395.86   | $397.0 (\nu: 1.5)$           |
| $c_{217}$                            | 1.00119  | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | 1059.32  | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\text{lowl}}^2$      | 23.43    | $23.3 (\nu: 0.6)$            |
| $c_{TE}$                             | 0.9954   | $0.996^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | 148.78   | $148.1^{+3.9}_{-3.9}$           | $\chi_{\text{CamSpec}}^2$   | 11498.3  | $11514.2 (\nu: 16.2)$        |
| $c_{EE}$                             | 0.9904   | $0.992^{+0.011}_{-0.010}$       | $k_{\text{D}}$              | 0.13956  | $0.1400^{+0.0028}_{-0.0028}$    | $\chi_{\text{JLA}}^2$       | 1034.88  | $1035.06 (\nu: 0.1)$         |
| $H_0$                                | 67.28    | $67.5^{+2.5}_{-2.4}$            | $100\theta_{\text{D}}$      | 0.16051  | $0.16069^{+0.00098}_{-0.00093}$ | $\chi_{6\text{DF}}^2$       | 0.006    | $0.047 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | 0.6925   | $0.691^{+0.013}_{-0.014}$       | $z_{\text{eq}}$             | 3391     | $3383^{+49}_{-51}$              | $\chi_{\text{MGS}}^2$       | 1.47     | $1.40 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | 0.3075   | $0.309^{+0.014}_{-0.013}$       | $k_{\text{eq}}$             | 0.010250 | $0.01028^{+0.00023}_{-0.00022}$ | $\chi_{\text{DR12BAO}}^2$   | 3.77     | $4.5 (\nu: 0.9)$             |
| $\Omega_{\text{m}} h^2$              | 0.1392   | $0.1407^{+0.0069}_{-0.0065}$    | $100\theta_{\text{eq}}$     | 0.8150   | $0.8167^{+0.0097}_{-0.0093}$    | $\chi_{\text{prior}}^2$     | 2.1      | $7.8 (\nu: 5.8)$             |
| $\Omega_\nu h^2$                     | 0.00001  | < 0.00129                       | $100\theta_{\text{s,eq}}$   | 0.45036  | $0.4512^{+0.0050}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | 11926.3  | $11943.8 (\nu: 17.3)$        |
| $\Omega_{\text{m}} h^3$              | 0.0936   | $0.0950^{+0.0079}_{-0.0072}$    | $H(0.15)$                   | 72.47    | $72.7^{+2.5}_{-2.4}$            | $\chi_{\text{BAO}}^2$       | 5.25     | $6.0 (\nu: 0.6)$             |
| $\sigma_8$                           | 0.8139   | $0.809^{+0.022}_{-0.023}$       | $D_M(0.15)$                 | 644.6    | $643^{+23}_{-23}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 12968.49$ ;  $\Delta\chi_{\text{eff}}^2 = -2.00$ ;  $\bar{\chi}_{\text{eff}}^2 = 12992.58$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.19$ ;  $R - 1 = 0.00612$

$\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 ( $\Delta$  -0.02) MGS: 1.47 ( $\Delta$  0.19) DR12BAO: 3.77 ( $\Delta$  -0.46) CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consect8: 8.66 ( $\Delta$  -0.31) small\_100x143\_offlike5\_EE\_Aplanc 395.86 ( $\Delta$  -0.19) commander\_dx12\_v3.2\_29: 23.43 ( $\Delta$  0.66) CamSpec like\_10.7HM.1400\_unified: 11498.34 ( $\Delta$  -1.83) SN - JLA Pantheon18: 1034.88 ( $\Delta$  -0.10)



## 8.22 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022234 | $0.02227^{+0.00035}_{-0.00035}$ | $S_8$                       | 0.8245   | $0.822^{+0.023}_{-0.022}$       | $H(0.38)$                   | 82.26    | $82.5^{+2.2}_{-2.1}$         |
| $\Omega_c h^2$                       | 0.1167   | $0.1176^{+0.0054}_{-0.0052}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4516   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1542.0   | $1539^{+45}_{-44}$           |
| $100\theta_{MC}$                     | 1.04126  | $1.04113^{+0.00082}_{-0.00083}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6059   | $0.603^{+0.015}_{-0.015}$       | $H(0.51)$                   | 88.88    | $89.1^{+2.3}_{-2.2}$         |
| $\tau$                               | 0.0531   | $0.054^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9925   | $0.985^{+0.021}_{-0.022}$       | $D_M(0.51)$                 | 1998     | $1994^{+56}_{-56}$           |
| $\Sigma m_\nu$ [eV]                  | 0.002    | $< 0.127$                       | $r_{\text{drag}} h$         | 99.99    | $99.7^{+1.7}_{-1.8}$            | $H(0.61)$                   | 94.41    | $94.7^{+2.3}_{-2.3}$         |
| $N_{\text{eff}}$                     | 2.881    | $2.95^{+0.33}_{-0.32}$          | $\langle d^2 \rangle^{1/2}$ | 2.4419   | $2.436^{+0.042}_{-0.043}$       | $D_M(0.61)$                 | 2325     | $2320^{+64}_{-64}$           |
| $\ln(10^{10} A_s)$                   | 3.0323   | $3.037^{+0.033}_{-0.032}$       | $z_{\text{re}}$             | 7.51     | $7.6^{+1.4}_{-1.5}$             | $H(2.33)$                   | 233.35   | $234.5^{+4.9}_{-4.7}$        |
| $n_s$                                | 0.9621   | $0.964^{+0.013}_{-0.013}$       | $10^9 A_s$                  | 2.074    | $2.085^{+0.070}_{-0.065}$       | $D_M(2.33)$                 | 5820     | $5801^{+140}_{-130}$         |
| $y_{\text{cal}}$                     | 1.00037  | $1.0007^{+0.0048}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | 1.8653   | $1.870^{+0.032}_{-0.032}$       | $f\sigma_8(0.15)$           | 0.4557   | $0.455^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | 224.9    | $237^{+50}_{-50}$               | $D_{40}$                    | 1229.3   | $1229^{+25}_{-25}$              | $\sigma_8(0.15)$            | 0.7515   | $0.746^{+0.020}_{-0.022}$    |
| $A_{143}^{\text{PS}}$                | 49.7     | $38^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5725^{+74}_{-74}$              | $f\sigma_8(0.38)$           | 0.4746   | $0.473^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | 106.4    | $103^{+30}_{-30}$               | $D_{810}$                   | 2533.7   | $2534^{+26}_{-26}$              | $\sigma_8(0.38)$            | 0.6663   | $0.662^{+0.018}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | 40.5     | $39^{+10}_{-10}$                | $D_{1420}$                  | 817.7    | $816.9^{+9.7}_{-9.6}$           | $f\sigma_8(0.51)$           | 0.4734   | $0.472^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | 6.50     | $< 7.53$                        | $D_{2000}$                  | 231.74   | $231.1^{+3.8}_{-3.8}$           | $\sigma_8(0.51)$            | 0.6236   | $0.619^{+0.017}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.752    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9621   | $0.964^{+0.013}_{-0.013}$       | $f\sigma_8(0.61)$           | 0.4686   | $0.467^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.89     | —                               | $Y_{\text{P}}$              | 0.24310  | $0.2440^{+0.0045}_{-0.0045}$    | $\sigma_8(0.61)$            | 0.5933   | $0.589^{+0.017}_{-0.018}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.93     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.24441  | $0.2453^{+0.0045}_{-0.0045}$    | $f\sigma_8(2.33)$           | 0.2983   | $0.2970^{+0.0083}_{-0.0086}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.554    | $2.570^{+0.097}_{-0.091}$       | $\sigma_8(2.33)$            | 0.3081   | $0.3063^{+0.0091}_{-0.0097}$ |
| $A_{100}^{\text{dust}}$              | 1.010    | $1.01^{+0.38}_{-0.39}$          | $\text{Age/Gyr}$            | 13.933   | $13.89^{+0.33}_{-0.32}$         | $f_{2000}^{143}$            | 28.4     | $29^{+6}_{-6}$               |
| $A_{143}^{\text{dust}}$              | 0.979    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.63  | $1089.73^{+0.70}_{-0.67}$       | $f_{2000}^{217}$            | 105.40   | $106.2^{+4.1}_{-4.1}$        |
| $A_{217}^{\text{dust}}$              | 0.991    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 146.26   | $145.7^{+3.2}_{-3.1}$           | $f_{2000}^{143 \times 217}$ | 30.79    | $31^{+4}_{-4}$               |
| $A_{143 \times 217}^{\text{dust}}$   | 1.005    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04153  | $1.04139^{+0.00099}_{-0.0010}$  | $\chi_{\text{lensing}}^2$   | 8.62     | $9.24 (\nu: 0.3)$            |
| $c_{100}$                            | 0.99787  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 14.043   | $13.99^{+0.29}_{-0.29}$         | $\chi_{\text{small}}^2$     | 395.85   | $397.0 (\nu: 1.4)$           |
| $c_{217}$                            | 1.00123  | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | 1059.25  | $1059.4^{+1.2}_{-1.2}$          | $\chi_{\text{lowl}}^2$      | 23.55    | $23.5 (\nu: 0.6)$            |
| $c_{TE}$                             | 0.9956   | $0.9960^{+0.0099}_{-0.0099}$    | $r_{\text{drag}}$           | 149.00   | $148.4^{+3.3}_{-3.3}$           | $\chi_{\text{CamSpec}}^2$   | 11498.3  | $11513.7 (\nu: 15.6)$        |
| $c_{EE}$                             | 0.9905   | $0.991^{+0.010}_{-0.010}$       | $k_{\text{D}}$              | 0.13941  | $0.1398^{+0.0024}_{-0.0023}$    | $\chi_{\text{Aver15}}^2$    | 0.01     | $0.35 (\nu: 0.1)$            |
| $H_0$                                | 67.11    | $67.2^{+2.2}_{-2.1}$            | $100\theta_{\text{D}}$      | 0.16047  | $0.16062^{+0.00083}_{-0.00081}$ | $\chi_{6\text{DF}}^2$       | 0.010    | $0.058 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | 0.6916   | $0.689^{+0.013}_{-0.015}$       | $z_{\text{eq}}$             | 3394.4   | $3387^{+49}_{-49}$              | $\chi_{\text{MGS}}^2$       | 1.41     | $1.31 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | 0.3084   | $0.311^{+0.015}_{-0.013}$       | $k_{\text{eq}}$             | 0.010244 | $0.01027^{+0.00020}_{-0.00020}$ | $\chi_{\text{DR12BAO}}^2$   | 3.88     | $4.8 (\nu: 1.2)$             |
| $\Omega_{\text{m}} h^2$              | 0.1389   | $0.1404^{+0.0058}_{-0.0055}$    | $100\theta_{\text{eq}}$     | 0.8144   | $0.8158^{+0.0093}_{-0.0091}$    | $\chi_{\text{prior}}^2$     | 1.9      | $7.8 (\nu: 5.8)$             |
| $\Omega_\nu h^2$                     | 0.00002  | $< 0.00133$                     | $100\theta_{s,\text{eq}}$   | 0.45006  | $0.4507^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | 11926.4  | $11943.4 (\nu: 16.8)$        |
| $\Omega_{\text{m}} h^3$              | 0.0932   | $0.0943^{+0.0065}_{-0.0061}$    | $H(0.15)$                   | 72.30    | $72.4^{+2.2}_{-2.1}$            | $\chi_{\text{BAO}}^2$       | 5.30     | $6.1 (\nu: 0.8)$             |
| $\sigma_8$                           | 0.8131   | $0.808^{+0.021}_{-0.023}$       | $D_M(0.15)$                 | 646.2    | $645^{+20}_{-20}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11933.58$ ;  $\bar{\chi}_{\text{eff}}^2 = 11957.68$ ;  $R - 1 = 0.00718$

$\chi_{\text{eff}}^2$ : Abund - Yp\_Aver2015: 0.01 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.88 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb.consext8: 8.62 small\_100x143.offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12\_v3.2.29: 23.55 CamSpec like\_10.7HM.1400.unified: 11498.33



### 8.23 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Cooke17\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022234 | $0.02227^{+0.00035}_{-0.00035}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4525   | $0.451^{+0.012}_{-0.012}$       | $H(0.51)$                   | 89.13    | $89.3^{+2.1}_{-2.1}$         |
| $\Omega_c h^2$                       | 0.11744  | $0.1181^{+0.0050}_{-0.0049}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6073   | $0.604^{+0.014}_{-0.015}$       | $D_M(0.51)$                 | 1992     | $1990^{+54}_{-53}$           |
| $100\theta_{MC}$                     | 1.04113  | $1.04107^{+0.00079}_{-0.00079}$ | $\sigma_8/h^{0.5}$          | 0.9934   | $0.986^{+0.020}_{-0.023}$       | $H(0.61)$                   | 94.69    | $94.9^{+2.2}_{-2.1}$         |
| $\tau$                               | 0.0531   | $0.054^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$         | 99.99    | $99.7^{+1.7}_{-1.8}$            | $D_M(0.61)$                 | 2318     | $2316^{+62}_{-61}$           |
| $\Sigma m_\nu$ [eV]                  | 0.001    | $< 0.128$                       | $\langle d^2 \rangle^{1/2}$ | 2.4418   | $2.435^{+0.042}_{-0.043}$       | $H(2.33)$                   | 234.01   | $234.9^{+4.5}_{-4.5}$        |
| $N_{\text{eff}}$                     | 2.925    | $2.98^{+0.31}_{-0.30}$          | $z_{\text{re}}$             | 7.52     | $7.6^{+1.4}_{-1.5}$             | $D_M(2.33)$                 | 5803     | $5790^{+130}_{-130}$         |
| $\ln(10^{10} A_s)$                   | 3.0332   | $3.038^{+0.033}_{-0.032}$       | $10^9 A_s$                  | 2.076    | $2.087^{+0.069}_{-0.065}$       | $f\sigma_8(0.15)$           | 0.4566   | $0.455^{+0.012}_{-0.011}$    |
| $n_s$                                | 0.9629   | $0.964^{+0.013}_{-0.012}$       | $10^9 A_s e^{-2\tau}$       | 1.8672   | $1.872^{+0.031}_{-0.031}$       | $\sigma_8(0.15)$            | 0.7533   | $0.748^{+0.019}_{-0.022}$    |
| $y_{\text{cal}}$                     | 1.00013  | $1.0006^{+0.0048}_{-0.0047}$    | $D_{40}$                    | 1227.8   | $1228^{+25}_{-25}$              | $f\sigma_8(0.38)$           | 0.4756   | $0.474^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | 230.5    | $238^{+50}_{-50}$               | $D_{220}$                   | 5714     | $5723^{+73}_{-73}$              | $\sigma_8(0.38)$            | 0.6679   | $0.663^{+0.018}_{-0.020}$    |
| $A_{143}^{\text{PS}}$                | 42.3     | $38^{+20}_{-20}$                | $D_{810}$                   | 2531.4   | $2534^{+26}_{-26}$              | $f\sigma_8(0.51)$           | 0.4745   | $0.473^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | 103.4    | $103^{+30}_{-30}$               | $D_{1420}$                  | 816.1    | $816.5^{+9.5}_{-9.6}$           | $\sigma_8(0.51)$            | 0.6250   | $0.620^{+0.017}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | 42.8     | $39^{+10}_{-10}$                | $D_{2000}$                  | 231.02   | $230.8^{+3.6}_{-3.6}$           | $f\sigma_8(0.61)$           | 0.4697   | $0.468^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | 6.50     | $< 7.51$                        | $n_{s,0.002}$               | 0.9629   | $0.964^{+0.013}_{-0.012}$       | $\sigma_8(0.61)$            | 0.5947   | $0.590^{+0.016}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.661    | $0.66^{+0.25}_{-0.25}$          | $Y_P$                       | 0.24370  | $0.2444^{+0.0042}_{-0.0042}$    | $f\sigma_8(2.33)$           | 0.2990   | $0.2974^{+0.0080}_{-0.0084}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.79     | —                               | $Y_P^{\text{BBN}}$          | 0.24502  | $0.2457^{+0.0042}_{-0.0043}$    | $\sigma_8(2.33)$            | 0.3089   | $0.3067^{+0.0088}_{-0.0097}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.38     | —                               | $10^5 D/H$                  | 2.569    | $2.580^{+0.086}_{-0.084}$       | $f_{2000}^{143}$            | 29.0     | $29^{+6}_{-6}$               |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | Age/Gyr                     | 13.893   | $13.86^{+0.31}_{-0.30}$         | $f_{2000}^{217}$            | 105.93   | $106.4^{+4.0}_{-4.0}$        |
| $A_{100}^{\text{dust}}$              | 0.998    | $1.01^{+0.38}_{-0.39}$          | $z_*$                       | 1089.74  | $1089.80^{+0.63}_{-0.62}$       | $f_{2000}^{143 \times 217}$ | 31.29    | $32^{+4}_{-4}$               |
| $A_{143}^{\text{dust}}$              | 0.972    | $0.96^{+0.35}_{-0.34}$          | $r_*$                       | 145.83   | $145.4^{+3.0}_{-2.9}$           | $\chi_{\text{lensing}}^2$   | 8.70     | $9.28 (\nu: 0.3)$            |
| $A_{217}^{\text{dust}}$              | 0.974    | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04138  | $1.04131^{+0.00094}_{-0.00094}$ | $\chi_{\text{small}}^2$     | 395.85   | $396.9 (\nu: 1.4)$           |
| $A_{143 \times 217}^{\text{dust}}$   | 1.008    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 14.003   | $13.96^{+0.28}_{-0.27}$         | $\chi_{\text{lowl}}^2$      | 23.46    | $23.4 (\nu: 0.5)$            |
| $c_{100}$                            | 0.99768  | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.32  | $1059.5^{+1.2}_{-1.3}$          | $\chi_{\text{CamSpec}}^2$   | 11498.3  | $11513.7 (\nu: 15.5)$        |
| $c_{217}$                            | 1.00121  | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | 148.55   | $148.1^{+3.1}_{-3.0}$           | $\chi_{\text{Aver15}}^2$    | 0.00     | $0.33 (\nu: 0.1)$            |
| $c_{TE}$                             | 0.9958   | $0.9963^{+0.0099}_{-0.0099}$    | $k_D$                       | 0.13969  | $0.1400^{+0.0022}_{-0.0022}$    | $\chi_{\text{Cooke17}}^2$   | 0.27     | $0.38 (\nu: 0.1)$            |
| $c_{EE}$                             | 0.9910   | $0.992^{+0.010}_{-0.010}$       | $100\theta_D$               | 0.16060  | $0.16071^{+0.00074}_{-0.00075}$ | $\chi_{6\text{DF}}^2$       | 0.010    | $0.057 (\nu: 0.0)$           |
| $H_0$                                | 67.31    | $67.3^{+2.1}_{-2.0}$            | $z_{\text{eq}}$             | 3392.9   | $3386^{+48}_{-48}$              | $\chi_{\text{MGS}}^2$       | 1.41     | $1.32 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | 0.6917   | $0.689^{+0.013}_{-0.015}$       | $k_{\text{eq}}$             | 0.010271 | $0.01028^{+0.00019}_{-0.00019}$ | $\chi_{\text{DR12BAO}}^2$   | 3.89     | $4.8 (\nu: 1.2)$             |
| $\Omega_m$                           | 0.3083   | $0.311^{+0.015}_{-0.013}$       | $100\theta_{\text{eq}}$     | 0.8146   | $0.8160^{+0.0093}_{-0.0090}$    | $\chi_{\text{prior}}^2$     | 2.1      | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^2$                       | 0.1397   | $0.1408^{+0.0054}_{-0.0052}$    | $100\theta_{s,\text{eq}}$   | 0.45016  | $0.4509^{+0.0047}_{-0.0046}$    | $\chi_{\text{CMB}}^2$       | 11926.3  | $11943.3 (\nu: 16.7)$        |
| $\Omega_\nu h^2$                     | 0.00001  | $< 0.00135$                     | $H(0.15)$                   | 72.52    | $72.6^{+2.1}_{-2.0}$            | $\chi_{\text{BAO}}^2$       | 5.31     | $6.1 (\nu: 0.8)$             |
| $\Omega_m h^3$                       | 0.0940   | $0.0949^{+0.0061}_{-0.0059}$    | $D_M(0.15)$                 | 644.3    | $644^{+19}_{-19}$               | $\chi_{\text{Abund}}^2$     | 0.27     | $0.72 (\nu: 0.2)$            |
| $\sigma_8$                           | 0.8150   | $0.809^{+0.020}_{-0.023}$       | $H(0.38)$                   | 82.50    | $82.6^{+2.1}_{-2.1}$            |                             |          |                              |
| $S_8$                                | 0.8262   | $0.823^{+0.022}_{-0.022}$       | $D_M(0.38)$                 | 1537.4   | $1536^{+43}_{-42}$              |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11933.95$ ;  $\bar{\chi}_{\text{eff}}^2 = 11957.95$ ;  $R - 1 = 0.00786$   
 $\chi_{\text{eff}}^2$ : Abund - Yp\_Aver2015: 0.00 D\_Cooke2017: 0.27 BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.89 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb\_consext8: 8.70  
simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.85 commander\_dx12.v3.2\_29: 23.46 CamSpec like\_10.7HM\_1400\_unified: 11498.26



## 8.24 base\_nnu\_mnu\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_BAO\_post\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02230^{+0.00037}_{-0.00037}$ | $S_8$                       | $0.822^{+0.022}_{-0.022}$       | $H(0.38)$                   | $82.7^{+2.6}_{-2.5}$         |
| $\Omega_c h^2$                       | $0.1180^{+0.0065}_{-0.0062}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1534^{+51}_{-51}$           |
| $100\theta_{MC}$                     | $1.04109^{+0.00091}_{-0.00091}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.015}_{-0.015}$       | $H(0.51)$                   | $89.4^{+2.7}_{-2.6}$         |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.020}_{-0.022}$       | $D_M(0.51)$                 | $1987^{+65}_{-65}$           |
| $\Sigma m_\nu$ [eV]                  | $< 0.124$                       | $r_{\text{drag}} h$         | $99.9^{+1.7}_{-1.7}$            | $H(0.61)$                   | $95.0^{+2.8}_{-2.7}$         |
| $N_{\text{eff}}$                     | $2.98^{+0.40}_{-0.38}$          | $\langle d^2 \rangle^{1/2}$ | $2.435^{+0.042}_{-0.043}$       | $D_M(0.61)$                 | $2313^{+74}_{-74}$           |
| $\ln(10^{10} A_s)$                   | $3.040^{+0.032}_{-0.030}$       | $z_{\text{re}}$             | $< 8.88$                        | $H(2.33)$                   | $234.8^{+5.8}_{-5.6}$        |
| $n_s$                                | $0.965^{+0.015}_{-0.014}$       | $10^9 A_s$                  | $2.092^{+0.067}_{-0.063}$       | $D_M(2.33)$                 | $5786^{+160}_{-160}$         |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | $1.872^{+0.036}_{-0.036}$       | $f\sigma_8(0.15)$           | $0.455^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                    | $1228^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.021}_{-0.022}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5725^{+74}_{-74}$              | $f\sigma_8(0.38)$           | $0.474^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.664^{+0.019}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $816.7^{+9.7}_{-9.8}$           | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $D_{2000}$                  | $231.0^{+4.0}_{-4.0}$           | $\sigma_8(0.51)$            | $0.621^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.965^{+0.015}_{-0.014}$       | $f\sigma_8(0.61)$           | $0.468^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2444^{+0.0054}_{-0.0053}$    | $\sigma_8(0.61)$            | $0.591^{+0.018}_{-0.019}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2458^{+0.0055}_{-0.0053}$    | $f\sigma_8(2.33)$           | $0.2979^{+0.0090}_{-0.0089}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 D/H$                  | $2.58^{+0.11}_{-0.10}$          | $\sigma_8(2.33)$            | $0.3073^{+0.0099}_{-0.010}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $\text{Age/Gyr}$            | $13.85^{+0.38}_{-0.39}$         | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | $1089.75^{+0.77}_{-0.75}$       | $f_{2000}^{217}$            | $106.4^{+4.4}_{-4.3}$        |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $145.4^{+3.8}_{-3.8}$           | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.32}$          | $100\theta_*$               | $1.0413^{+0.0011}_{-0.0011}$    | $\chi_{\text{lensing}}^2$   | $9.25 (\nu: 0.3)$            |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.96^{+0.35}_{-0.35}$         | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1059.6^{+1.5}_{-1.4}$          | $\chi_{\text{lowl}}^2$      | $23.3 (\nu: 0.6)$            |
| $c_{TE}$                             | $0.996^{+0.010}_{-0.010}$       | $r_{\text{drag}}$           | $148.1^{+3.9}_{-3.9}$           | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 16.2)$        |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.010}$       | $k_D$                       | $0.1401^{+0.0028}_{-0.0027}$    | $\chi_{\text{JLA}}^2$       | $1035.05 (\nu: 0.1)$         |
| $H_0$                                | $67.5^{+2.5}_{-2.4}$            | $100\theta_D$               | $0.16069^{+0.00098}_{-0.00093}$ | $\chi_{6\text{DF}}^2$       | $0.045 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.691^{+0.013}_{-0.014}$       | $z_{\text{eq}}$             | $3382^{+49}_{-51}$              | $\chi_{\text{MGS}}^2$       | $1.41 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.309^{+0.014}_{-0.013}$       | $k_{\text{eq}}$             | $0.01027^{+0.00023}_{-0.00022}$ | $\chi_{\text{DR12BAO}}^2$   | $4.5 (\nu: 0.9)$             |
| $\Omega_m h^2$                       | $0.1408^{+0.0069}_{-0.0065}$    | $100\theta_{\text{eq}}$     | $0.8168^{+0.0097}_{-0.0092}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_\nu h^2$                     | $< 0.00130$                     | $100\theta_{s,\text{eq}}$   | $0.4513^{+0.0049}_{-0.0047}$    | $\chi_{\text{CMB}}^2$       | $11943.7 (\nu: 17.2)$        |
| $\Omega_m h^3$                       | $0.0950^{+0.0079}_{-0.0072}$    | $H(0.15)$                   | $72.7^{+2.5}_{-2.4}$            | $\chi_{\text{BAO}}^2$       | $5.9 (\nu: 0.5)$             |
| $\sigma_8$                           | $0.810^{+0.022}_{-0.023}$       | $D_M(0.15)$                 | $643^{+23}_{-22}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12992.45; \Delta\bar{\chi}_{\text{eff}}^2 = 0.20; R - 1 = 0.00689$$



## 9 nnu+yhe

### 9.1 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022190 | $0.02222^{+0.00046}_{-0.00045}$ | $\Omega_m h^3$                 | 0.0905   | $0.091^{+0.011}_{-0.011}$       | $100\theta_{\text{eq}}$     | 0.8098   | $0.811^{+0.015}_{-0.016}$    |
| $\Omega_c h^2$                       | 0.1151   | $0.1157^{+0.0095}_{-0.0093}$    | $\sigma_8$                     | 0.7983   | $0.800^{+0.026}_{-0.025}$       | $100\theta_{\text{s,eq}}$   | 0.4477   | $0.4481^{+0.0078}_{-0.0080}$ |
| $100\theta_{\text{MC}}$              | 1.04185  | $1.0419^{+0.0027}_{-0.0028}$    | $S_8$                          | 0.8246   | $0.824^{+0.032}_{-0.031}$       | $H(0.15)$                   | 70.90    | $71.2^{+3.8}_{-3.5}$         |
| $\tau$                               | 0.0527   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.5}$      | 0.4516   | $0.452^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.15)$        | 659.9    | $657^{+35}_{-35}$            |
| $N_{\text{eff}}$                     | 2.74     | $2.78^{+0.65}_{-0.57}$          | $\sigma_8 \Omega_m^{0.25}$     | 0.6004   | $0.601^{+0.019}_{-0.018}$       | $H(0.38)$                   | 80.96    | $81.3^{+3.9}_{-3.6}$         |
| $Y_{\text{P}}$                       | 0.2548   | $0.256^{+0.042}_{-0.046}$       | $\sigma_8/h^{0.5}$             | 0.9853   | $0.985^{+0.023}_{-0.023}$       | $D_{\text{M}}(0.38)$        | 1572     | $1566^{+80}_{-80}$           |
| $\ln(10^{10} A_{\text{s}})$          | 3.0295   | $3.031^{+0.039}_{-0.037}$       | $r_{\text{drag}} h$            | 98.58    | $98.8^{+2.6}_{-2.7}$            | $H(0.51)$                   | 87.63    | $88.0^{+4.0}_{-3.7}$         |
| $n_{\text{s}}$                       | 0.9609   | $0.962^{+0.019}_{-0.019}$       | $\langle d^2 \rangle^{1/2}$    | 2.440    | $2.438^{+0.061}_{-0.060}$       | $D_{\text{M}}(0.51)$        | 2034     | $2027^{+100}_{-100}$         |
| $y_{\text{cal}}$                     | 1.00029  | $1.0005^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                | 7.50     | $7.5^{+1.6}_{-1.7}$             | $H(0.61)$                   | 93.20    | $93.5^{+4.1}_{-3.8}$         |
| $A_{100}^{\text{PS}}$                | 232      | $240^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | 2.069    | $2.072^{+0.082}_{-0.076}$       | $D_{\text{M}}(0.61)$        | 2366     | $2358^{+110}_{-110}$         |
| $A_{143}^{\text{PS}}$                | 44.4     | $40^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | 1.8617   | $1.865^{+0.041}_{-0.041}$       | $H(2.33)$                   | 232.2    | $232.7^{+8.6}_{-7.8}$        |
| $A_{217}^{\text{PS}}$                | 106.8    | $102^{+30}_{-30}$               | $D_{40}$                       | 1228.2   | $1228^{+36}_{-35}$              | $D_{\text{M}}(2.33)$        | 5889     | $5872^{+240}_{-250}$         |
| $A_{217}^{\text{CIB}}$               | 39.8     | $40^{+10}_{-10}$                | $D_{220}$                      | 5711     | $5715^{+77}_{-77}$              | $f\sigma_8(0.15)$           | 0.4555   | $0.455^{+0.017}_{-0.016}$    |
| $A_{143}^{\text{tSZ}}$               | 5.46     | $< 7.42$                        | $D_{810}$                      | 2533.2   | $2533^{+27}_{-28}$              | $\sigma_8(0.15)$            | 0.7368   | $0.738^{+0.024}_{-0.023}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.731    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                     | 816.8    | $816^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4716   | $0.472^{+0.015}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.65     | —                               | $D_{2000}$                     | 230.99   | $230.4^{+4.6}_{-4.6}$           | $\sigma_8(0.38)$            | 0.6522   | $0.654^{+0.023}_{-0.022}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.62     | —                               | $n_{\text{s},0.002}$           | 0.9609   | $0.962^{+0.019}_{-0.019}$       | $f\sigma_8(0.51)$           | 0.4693   | $0.470^{+0.014}_{-0.014}$    |
| $A^{\text{kSZ}}$                     | 1.6      | —                               | $Y_{\text{P}}$                 | 0.2548   | $0.256^{+0.042}_{-0.046}$       | $\sigma_8(0.51)$            | 0.6100   | $0.611^{+0.022}_{-0.021}$    |
| $A_{100}^{\text{dust}}$              | 0.994    | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.2561   | $0.258^{+0.042}_{-0.046}$       | $f\sigma_8(0.61)$           | 0.4637   | $0.464^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{dust}}$              | 0.963    | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                        | 14.10    | $14.06^{+0.58}_{-0.59}$         | $\sigma_8(0.61)$            | 0.5802   | $0.582^{+0.021}_{-0.020}$    |
| $A_{217}^{\text{dust}}$              | 0.978    | $0.97^{+0.20}_{-0.20}$          | $z_*$                          | 1089.96  | $1090.1^{+1.2}_{-1.2}$          | $f\sigma_8(2.33)$           | 0.2922   | $0.293^{+0.011}_{-0.011}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.046    | $1.02^{+0.32}_{-0.32}$          | $r_*$                          | 147.4    | $147.1^{+5.6}_{-5.8}$           | $\sigma_8(2.33)$            | 0.3009   | $0.302^{+0.012}_{-0.011}$    |
| $c_{100}$                            | 0.99771  | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$                  | 1.04190  | $1.0419^{+0.0020}_{-0.0020}$    | $f_{2000}^{143}$            | 29.0     | $30^{+7}_{-7}$               |
| $c_{217}$                            | 1.00096  | $1.0011^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | 14.15    | $14.12^{+0.51}_{-0.53}$         | $f_{2000}^{217}$            | 106.2    | $107.0^{+5.2}_{-5.1}$        |
| $c_{\text{TE}}$                      | 0.9966   | $0.997^{+0.011}_{-0.011}$       | $z_{\text{drag}}$              | 1059.36  | $1059.5^{+1.9}_{-1.9}$          | $f_{2000}^{143 \times 217}$ | 31.7     | $32^{+6}_{-6}$               |
| $c_{\text{EE}}$                      | 0.9917   | $0.993^{+0.013}_{-0.013}$       | $r_{\text{drag}}$              | 150.2    | $149.8^{+5.8}_{-6.0}$           | $\chi_{\text{simall}}^2$    | 395.87   | $396.9 (\nu: 1.4)$           |
| $H_0$                                | 65.64    | $65.9^{+3.8}_{-3.6}$            | $k_{\text{D}}$                 | 0.1382   | $0.1384^{+0.0054}_{-0.0049}$    | $\chi_{\text{lowl}}^2$      | 23.44    | $23.5 (\nu: 1.2)$            |
| $\Omega_{\Lambda}$                   | 0.6799   | $0.681^{+0.021}_{-0.023}$       | $100\theta_{\text{D}}$         | 0.16070  | $0.1609^{+0.0014}_{-0.0014}$    | $\chi_{\text{CamSpec}}^2$   | 11498.8  | $11515.3 (\nu: 18.4)$        |
| $\Omega_{\text{m}}$                  | 0.3201   | $0.319^{+0.023}_{-0.021}$       | $z_{\text{eq}}$                | 3422     | $3418^{+90}_{-85}$              | $\chi_{\text{prior}}^2$     | 1.9      | $7.9 (\nu: 6.0)$             |
| $\Omega_{\text{m}} h^2$              | 0.1379   | $0.1386^{+0.0096}_{-0.0094}$    | $k_{\text{eq}}$                | 0.010225 | $0.01024^{+0.00032}_{-0.00030}$ | $\chi_{\text{CMB}}^2$       | 11918.1  | $11935.7 (\nu: 19.1)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11920.00$ ;  $\Delta\chi_{\text{eff}}^2 = -0.76$ ;  $\bar{\chi}_{\text{eff}}^2 = 11943.57$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 1.12$ ;  $R - 1 = 0.00989$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 ( $\Delta$  -0.03) commander\_dx12.v3.2.29: 23.44 ( $\Delta$  0.44) CamSpec like\_10.7HM\_1400\_unified: 11498.75 ( $\Delta$  -0.90)



## 9.2 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02233^{+0.00039}_{-0.00038}$ | $S_8$                       | $0.816^{+0.028}_{-0.027}$       | $H(0.38)$                   | $82.2^{+3.5}_{-3.2}$         |
| $\Omega_c h^2$                       | $0.1164^{+0.0095}_{-0.0093}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.447^{+0.015}_{-0.015}$       | $D_M(0.38)$                 | $1545^{+67}_{-67}$           |
| $100\theta_{MC}$                     | $1.0418^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.599^{+0.018}_{-0.018}$       | $H(0.51)$                   | $88.8^{+3.7}_{-3.3}$         |
| $\tau$                               | $0.054^{+0.015}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.980^{+0.021}_{-0.021}$       | $D_M(0.51)$                 | $2002^{+84}_{-86}$           |
| $N_{\text{eff}}$                     | $2.88^{+0.59}_{-0.57}$          | $r_{\text{drag}} h$         | $99.7^{+1.7}_{-1.7}$            | $H(0.61)$                   | $94.4^{+3.8}_{-3.5}$         |
| $Y_P$                                | $0.257^{+0.042}_{-0.045}$       | $\langle d^2 \rangle^{1/2}$ | $2.422^{+0.052}_{-0.050}$       | $D_M(0.61)$                 | $2330^{+97}_{-99}$           |
| $\ln(10^{10} A_s)$                   | $3.036^{+0.036}_{-0.035}$       | $z_{\text{re}}$             | $7.6^{+1.5}_{-1.6}$             | $H(2.33)$                   | $233.6^{+8.1}_{-8.0}$        |
| $n_s$                                | $0.967^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.082^{+0.076}_{-0.073}$       | $D_M(2.33)$                 | $5823^{+210}_{-230}$         |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.869^{+0.040}_{-0.040}$       | $f\sigma_8(0.15)$           | $0.452^{+0.015}_{-0.014}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{40}$                    | $1220^{+32}_{-31}$              | $\sigma_8(0.15)$            | $0.741^{+0.024}_{-0.023}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                   | $5719^{+77}_{-77}$              | $f\sigma_8(0.38)$           | $0.470^{+0.015}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                   | $2534^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.657^{+0.021}_{-0.021}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{1420}$                  | $815.7^{+9.9}_{-10}$            | $f\sigma_8(0.51)$           | $0.469^{+0.014}_{-0.014}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.39$                        | $D_{2000}$                  | $230.1^{+4.5}_{-4.4}$           | $\sigma_8(0.51)$            | $0.615^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | $0.967^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | $0.464^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.257^{+0.042}_{-0.045}$       | $\sigma_8(0.61)$            | $0.585^{+0.019}_{-0.019}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.258^{+0.042}_{-0.046}$       | $f\sigma_8(2.33)$           | $0.2951^{+0.0099}_{-0.0098}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.94^{+0.51}_{-0.54}$         | $\sigma_8(2.33)$            | $0.304^{+0.011}_{-0.010}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.1^{+1.2}_{-1.1}$          | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $r_*$                       | $146.3^{+5.3}_{-5.6}$           | $f_{2000}^{217}$            | $107.3^{+5.0}_{-4.9}$        |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | $1.0417^{+0.0019}_{-0.0018}$    | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $14.04^{+0.48}_{-0.51}$         | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.9^{+1.7}_{-1.8}$          | $\chi_{\text{lowl}}^2$      | $22.7 (\nu: 0.7)$            |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $149.0^{+5.4}_{-5.7}$           | $\chi_{\text{CamSpec}}^2$   | $11516.0 (\nu: 18.2)$        |
| $c_{TE}$                             | $0.998^{+0.010}_{-0.010}$       | $k_D$                       | $0.1390^{+0.0054}_{-0.0049}$    | $\chi_{6\text{DF}}^2$       | $0.058 (\nu: 0.0)$           |
| $c_{EE}$                             | $0.994^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{\text{MGS}}^2$       | $1.32 (\nu: 0.1)$            |
| $H_0$                                | $67.0^{+3.2}_{-3.0}$            | $z_{\text{eq}}$             | $3390^{+65}_{-65}$              | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 1.1)$             |
| $\Omega_\Lambda$                     | $0.689^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | $0.01023^{+0.00033}_{-0.00030}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\Omega_m$                           | $0.311^{+0.014}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.816^{+0.011}_{-0.011}$       | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.7)$             |
| $\Omega_m h^2$                       | $0.1394^{+0.0096}_{-0.0094}$    | $100\theta_{s,\text{eq}}$   | $0.4508^{+0.0057}_{-0.0056}$    | $\chi_{\text{CMB}}^2$       | $11935.7 (\nu: 18.6)$        |
| $\Omega_m h^3$                       | $0.093^{+0.011}_{-0.010}$       | $H(0.15)$                   | $72.2^{+3.3}_{-3.0}$            |                             |                              |
| $\sigma_8$                           | $0.802^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | $648^{+29}_{-29}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11949.72; \Delta\bar{\chi}_{\text{eff}}^2 = 1.44; R - 1 = 0.01974$$



### 9.3 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02220^{+0.00045}_{-0.00043}$ | $\sigma_8$                         | $0.800^{+0.023}_{-0.022}$       | $H(0.15)$                   | $71.0^{+3.8}_{-3.4}$       |
| $\Omega_{\text{c}}h^2$               | $0.1156^{+0.0096}_{-0.0085}$    | $S_8$                              | $0.827^{+0.026}_{-0.026}$       | $D_{\text{M}}(0.15)$        | $659^{+34}_{-35}$          |
| $100\theta_{\text{MC}}$              | $1.0419^{+0.0027}_{-0.0027}$    | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.453^{+0.014}_{-0.014}$       | $H(0.38)$                   | $81.1^{+3.9}_{-3.5}$       |
| $\tau$                               | $0.054^{+0.015}_{-0.014}$       | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.602^{+0.015}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1570^{+77}_{-80}$         |
| $N_{\text{eff}}$                     | $2.76^{+0.64}_{-0.55}$          | $\sigma_8/h^{0.5}$                 | $0.987^{+0.019}_{-0.019}$       | $H(0.51)$                   | $87.8^{+4.0}_{-3.6}$       |
| $Y_{\text{P}}$                       | $0.255^{+0.042}_{-0.046}$       | $r_{\text{drag}}h$                 | $98.6^{+2.5}_{-2.5}$            | $D_{\text{M}}(0.51)$        | $2033^{+96}_{-100}$        |
| $\ln(10^{10}A_{\text{s}})$           | $3.033^{+0.035}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$        | $2.446^{+0.050}_{-0.050}$       | $H(0.61)$                   | $93.4^{+4.1}_{-3.7}$       |
| $n_{\text{s}}$                       | $0.961^{+0.018}_{-0.018}$       | $z_{\text{re}}$                    | $7.6^{+1.5}_{-1.5}$             | $D_{\text{M}}(0.61)$        | $2364^{+110}_{-120}$       |
| $y_{\text{cal}}$                     | $1.0006^{+0.0047}_{-0.0049}$    | $10^9 A_{\text{s}}$                | $2.075^{+0.073}_{-0.072}$       | $H(2.33)$                   | $232.5^{+8.3}_{-7.6}$      |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.864^{+0.039}_{-0.039}$       | $D_{\text{M}}(2.33)$        | $5883^{+230}_{-240}$       |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                           | $1231^{+34}_{-33}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$  |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                          | $5717^{+76}_{-76}$              | $\sigma_8(0.15)$            | $0.739^{+0.022}_{-0.021}$  |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                          | $2534^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.012}_{-0.012}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $D_{1420}$                         | $816.1^{+9.9}_{-10}$            | $\sigma_8(0.38)$            | $0.654^{+0.021}_{-0.020}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                         | $230.6^{+4.5}_{-4.5}$           | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$               | $0.961^{+0.018}_{-0.018}$       | $\sigma_8(0.51)$            | $0.612^{+0.020}_{-0.019}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                     | $0.255^{+0.042}_{-0.046}$       | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.011}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.257^{+0.043}_{-0.046}$       | $\sigma_8(0.61)$            | $0.582^{+0.020}_{-0.019}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.37}$          | Age/Gyr                            | $14.08^{+0.55}_{-0.58}$         | $f\sigma_8(2.33)$           | $0.293^{+0.011}_{-0.0099}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                              | $1090.0^{+1.2}_{-1.2}$          | $\sigma_8(2.33)$            | $0.302^{+0.012}_{-0.011}$  |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                              | $147.2^{+5.5}_{-5.6}$           | $f_{2000}^{143}$            | $30^{+7}_{-7}$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.32}$          | $100\theta_*$                      | $1.0419^{+0.0019}_{-0.0019}$    | $f_{2000}^{217}$            | $106.8^{+5.1}_{-5.1}$      |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $14.13^{+0.50}_{-0.51}$         | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$             |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$                  | $1059.5^{+1.9}_{-1.9}$          | $\chi_{\text{lensing}}^2$   | $9.05 (\nu: 0.3)$          |
| $c_{TE}$                             | $0.997^{+0.011}_{-0.010}$       | $r_{\text{drag}}$                  | $150.0^{+5.6}_{-5.8}$           | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.3)$         |
| $c_{EE}$                             | $0.992^{+0.012}_{-0.013}$       | $k_{\text{D}}$                     | $0.1383^{+0.0053}_{-0.0048}$    | $\chi_{\text{lowl}}^2$      | $23.8 (\nu: 1.2)$          |
| $H_0$                                | $65.7^{+3.8}_{-3.4}$            | $100\theta_{\text{D}}$             | $0.1608^{+0.0014}_{-0.0014}$    | $\chi_{\text{CamSpec}}^2$   | $11514.7 (\nu: 17.3)$      |
| $\Omega_{\Lambda}$                   | $0.679^{+0.021}_{-0.022}$       | $z_{\text{eq}}$                    | $3424^{+89}_{-84}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$           |
| $\Omega_{\text{m}}$                  | $0.321^{+0.022}_{-0.021}$       | $k_{\text{eq}}$                    | $0.01024^{+0.00030}_{-0.00027}$ | $\chi_{\text{CMB}}^2$       | $11944.4 (\nu: 18.8)$      |
| $\Omega_{\text{m}}h^2$               | $0.1384^{+0.0097}_{-0.0086}$    | $100\theta_{\text{eq}}$            | $0.810^{+0.015}_{-0.015}$       |                             |                            |
| $\Omega_{\text{m}}h^3$               | $0.0910^{+0.011}_{-0.0097}$     | $100\theta_{\text{s,eq}}$          | $0.4476^{+0.0077}_{-0.0078}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11952.22; \Delta\bar{\chi}_{\text{eff}}^2 = 0.78; R - 1 = 0.01363$$



#### 9.4 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02232^{+0.00038}_{-0.00038}$ | $S_8$                       | $0.820^{+0.023}_{-0.022}$       | $H(0.38)$                   | $82.1^{+3.4}_{-3.2}$         |
| $\Omega_c h^2$                       | $0.1164^{+0.0091}_{-0.0088}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1548^{+65}_{-67}$           |
| $100\theta_{MC}$                     | $1.0417^{+0.0026}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.601^{+0.015}_{-0.015}$       | $H(0.51)$                   | $88.7^{+3.6}_{-3.3}$         |
| $\tau$                               | $0.056^{+0.014}_{-0.014}$       | $\sigma_8/h^{0.5}$          | $0.983^{+0.018}_{-0.017}$       | $D_M(0.51)$                 | $2005^{+83}_{-85}$           |
| $N_{\text{eff}}$                     | $2.88^{+0.58}_{-0.56}$          | $r_{\text{drag}} h$         | $99.5^{+1.7}_{-1.7}$            | $H(0.61)$                   | $94.3^{+3.8}_{-3.4}$         |
| $Y_P$                                | $0.256^{+0.042}_{-0.046}$       | $\langle d^2 \rangle^{1/2}$ | $2.432^{+0.043}_{-0.043}$       | $D_M(0.61)$                 | $2333^{+95}_{-98}$           |
| $\ln(10^{10} A_s)$                   | $3.040^{+0.032}_{-0.032}$       | $z_{\text{re}}$             | $7.8^{+1.4}_{-1.4}$             | $H(2.33)$                   | $233.6^{+8.1}_{-7.3}$        |
| $n_s$                                | $0.966^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.091^{+0.067}_{-0.066}$       | $D_M(2.33)$                 | $5828^{+210}_{-220}$         |
| $y_{\text{cal}}$                     | $1.0008^{+0.0047}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.038}_{-0.038}$       | $f\sigma_8(0.15)$           | $0.454^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{40}$                    | $1224^{+31}_{-30}$              | $\sigma_8(0.15)$            | $0.743^{+0.021}_{-0.020}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                   | $5724^{+76}_{-75}$              | $f\sigma_8(0.38)$           | $0.472^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{810}$                   | $2536^{+26}_{-27}$              | $\sigma_8(0.38)$            | $0.658^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{1420}$                  | $816^{+10}_{-10}$               | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.35$                        | $D_{2000}$                  | $230.3^{+4.5}_{-4.4}$           | $\sigma_8(0.51)$            | $0.616^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | $0.966^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.256^{+0.042}_{-0.046}$       | $\sigma_8(0.61)$            | $0.586^{+0.018}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.257^{+0.042}_{-0.046}$       | $f\sigma_8(2.33)$           | $0.2956^{+0.0091}_{-0.0088}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.95^{+0.50}_{-0.53}$         | $\sigma_8(2.33)$            | $0.3047^{+0.0098}_{-0.0095}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.0^{+1.2}_{-1.2}$          | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.36}_{-0.35}$          | $r_*$                       | $146.3^{+5.1}_{-5.3}$           | $f_{2000}^{217}$            | $107.2^{+5.0}_{-5.0}$        |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.0417^{+0.0018}_{-0.0018}$    | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $14.04^{+0.47}_{-0.49}$         | $\chi_{\text{lensing}}^2$   | $9.27 (\nu: 0.4)$            |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.9^{+1.7}_{-1.8}$          | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.7)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $149.0^{+5.3}_{-5.5}$           | $\chi_{\text{lowl}}^2$      | $23.0 (\nu: 0.8)$            |
| $c_{TE}$                             | $0.997^{+0.010}_{-0.010}$       | $k_D$                       | $0.1390^{+0.0051}_{-0.0048}$    | $\chi_{\text{CamSpec}}^2$   | $11515.3 (\nu: 17.8)$        |
| $c_{EE}$                             | $0.993^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | $0.068 (\nu: 0.0)$           |
| $H_0$                                | $66.8^{+3.1}_{-2.9}$            | $z_{\text{eq}}$             | $3395^{+64}_{-66}$              | $\chi_{\text{MGS}}^2$       | $1.22 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | $0.688^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | $0.01024^{+0.00030}_{-0.00028}$ | $\chi_{\text{DR12BAO}}^2$   | $5.0 (\nu: 1.3)$             |
| $\Omega_m$                           | $0.312^{+0.014}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.815^{+0.011}_{-0.011}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$             |
| $\Omega_m h^2$                       | $0.1394^{+0.0092}_{-0.0089}$    | $100\theta_{s,\text{eq}}$   | $0.4504^{+0.0057}_{-0.0055}$    | $\chi_{\text{CMB}}^2$       | $11944.7 (\nu: 19.1)$        |
| $\Omega_m h^3$                       | $0.0932^{+0.010}_{-0.0098}$     | $H(0.15)$                   | $72.1^{+3.2}_{-3.0}$            | $\chi_{\text{BAO}}^2$       | $6.3 (\nu: 0.9)$             |
| $\sigma_8$                           | $0.804^{+0.022}_{-0.021}$       | $D_M(0.15)$                 | $649^{+29}_{-29}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11958.81; \Delta\bar{\chi}_{\text{eff}}^2 = 1.41; R - 1 = 0.01792$$



## 9.5 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                      | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|--------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02223^{+0.00045}_{-0.00045}$ | $\Omega_m h^3$                 | $0.092^{+0.011}_{-0.011}$       | $100\theta_{\text{eq}}$     | $0.811^{+0.015}_{-0.016}$    |
| $\Omega_c h^2$                       | $0.1157^{+0.0095}_{-0.0093}$    | $\sigma_8$                     | $0.801^{+0.025}_{-0.024}$       | $100\theta_{\text{s,eq}}$   | $0.4483^{+0.0077}_{-0.0079}$ |
| $100\theta_{\text{MC}}$              | $1.0419^{+0.0027}_{-0.0028}$    | $S_8$                          | $0.825^{+0.032}_{-0.031}$       | $H(0.15)$                   | $71.3^{+3.8}_{-3.5}$         |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_m^{0.5}$      | $0.452^{+0.018}_{-0.017}$       | $D_{\text{M}}(0.15)$        | $657^{+35}_{-35}$            |
| $N_{\text{eff}}$                     | $2.78^{+0.64}_{-0.57}$          | $\sigma_8 \Omega_m^{0.25}$     | $0.602^{+0.019}_{-0.018}$       | $H(0.38)$                   | $81.3^{+3.9}_{-3.6}$         |
| $Y_{\text{P}}$                       | $0.257^{+0.042}_{-0.046}$       | $\sigma_8/h^{0.5}$             | $0.986^{+0.023}_{-0.022}$       | $D_{\text{M}}(0.38)$        | $1565^{+80}_{-79}$           |
| $\ln(10^{10} A_{\text{s}})$          | $3.034^{+0.035}_{-0.033}$       | $r_{\text{drag}} h$            | $98.8^{+2.6}_{-2.6}$            | $H(0.51)$                   | $88.0^{+4.0}_{-3.7}$         |
| $n_{\text{s}}$                       | $0.962^{+0.019}_{-0.019}$       | $\langle d^2 \rangle^{1/2}$    | $2.440^{+0.060}_{-0.058}$       | $D_{\text{M}}(0.51)$        | $2026^{+100}_{-100}$         |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                | $< 8.85$                        | $H(0.61)$                   | $93.6^{+4.1}_{-3.8}$         |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $10^9 A_{\text{s}}$            | $2.078^{+0.073}_{-0.069}$       | $D_{\text{M}}(0.61)$        | $2357^{+110}_{-110}$         |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$ | $1.865^{+0.041}_{-0.042}$       | $H(2.33)$                   | $232.7^{+8.5}_{-7.8}$        |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{40}$                       | $1227^{+36}_{-35}$              | $D_{\text{M}}(2.33)$        | $5871^{+240}_{-240}$         |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{220}$                      | $5715^{+76}_{-76}$              | $f\sigma_8(0.15)$           | $0.456^{+0.017}_{-0.016}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.44$                        | $D_{810}$                      | $2533^{+27}_{-28}$              | $\sigma_8(0.15)$            | $0.740^{+0.024}_{-0.023}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                     | $816^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.472^{+0.015}_{-0.014}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $D_{2000}$                     | $230.4^{+4.5}_{-4.6}$           | $\sigma_8(0.38)$            | $0.655^{+0.022}_{-0.021}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $n_{\text{s},0.002}$           | $0.962^{+0.019}_{-0.019}$       | $f\sigma_8(0.51)$           | $0.470^{+0.014}_{-0.013}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}$                 | $0.257^{+0.042}_{-0.046}$       | $\sigma_8(0.51)$            | $0.613^{+0.021}_{-0.020}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | $0.258^{+0.042}_{-0.046}$       | $f\sigma_8(0.61)$           | $0.465^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                        | $14.05^{+0.58}_{-0.58}$         | $\sigma_8(0.61)$            | $0.583^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $z_*$                          | $1090.1^{+1.2}_{-1.2}$          | $f\sigma_8(2.33)$           | $0.294^{+0.011}_{-0.010}$    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $r_*$                          | $147.1^{+5.6}_{-5.8}$           | $\sigma_8(2.33)$            | $0.302^{+0.012}_{-0.011}$    |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$                  | $1.0419^{+0.0020}_{-0.0020}$    | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | $14.11^{+0.51}_{-0.53}$         | $f_{2000}^{217}$            | $107.0^{+5.2}_{-5.1}$        |
| $c_{TE}$                             | $0.997^{+0.011}_{-0.011}$       | $z_{\text{drag}}$              | $1059.6^{+1.9}_{-1.9}$          | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$               |
| $c_{EE}$                             | $0.993^{+0.013}_{-0.013}$       | $r_{\text{drag}}$              | $149.8^{+5.8}_{-5.9}$           | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.4)$           |
| $H_0$                                | $66.0^{+3.8}_{-3.6}$            | $k_{\text{D}}$                 | $0.1384^{+0.0054}_{-0.0049}$    | $\chi_{\text{lowl}}^2$      | $23.5 (\nu: 1.2)$            |
| $\Omega_{\Lambda}$                   | $0.682^{+0.021}_{-0.023}$       | $100\theta_{\text{D}}$         | $0.1609^{+0.0014}_{-0.0014}$    | $\chi_{\text{CamSpec}}^2$   | $11515.2 (\nu: 18.5)$        |
| $\Omega_{\text{m}}$                  | $0.318^{+0.023}_{-0.021}$       | $z_{\text{eq}}$                | $3417^{+90}_{-84}$              | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.0)$             |
| $\Omega_{\text{m}} h^2$              | $0.1385^{+0.0096}_{-0.0094}$    | $k_{\text{eq}}$                | $0.01024^{+0.00032}_{-0.00030}$ | $\chi_{\text{CMB}}^2$       | $11935.4 (\nu: 18.9)$        |

$$\bar{\chi}_{\text{eff}}^2 = 11943.30; \Delta\bar{\chi}_{\text{eff}}^2 = 1.12; R - 1 = 0.00937$$



## 9.6 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02233^{+0.00039}_{-0.00038}$ | $S_8$                       | $0.817^{+0.028}_{-0.026}$       | $H(0.38)$                   | $82.2^{+3.6}_{-3.2}$         |
| $\Omega_c h^2$                       | $0.1164^{+0.0095}_{-0.0092}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.448^{+0.015}_{-0.014}$       | $D_M(0.38)$                 | $1545^{+66}_{-68}$           |
| $100\theta_{MC}$                     | $1.0418^{+0.0026}_{-0.0028}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.599^{+0.018}_{-0.017}$       | $H(0.51)$                   | $88.8^{+3.7}_{-3.3}$         |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.981^{+0.021}_{-0.019}$       | $D_M(0.51)$                 | $2002^{+84}_{-86}$           |
| $N_{\text{eff}}$                     | $2.88^{+0.60}_{-0.57}$          | $r_{\text{drag}} h$         | $99.7^{+1.8}_{-1.7}$            | $H(0.61)$                   | $94.4^{+3.7}_{-3.6}$         |
| $Y_P$                                | $0.257^{+0.042}_{-0.046}$       | $\langle d^2 \rangle^{1/2}$ | $2.424^{+0.051}_{-0.047}$       | $D_M(0.61)$                 | $2329^{+96}_{-100}$          |
| $\ln(10^{10} A_s)$                   | $3.038^{+0.033}_{-0.032}$       | $z_{\text{re}}$             | $< 8.93$                        | $H(2.33)$                   | $233.6^{+8.2}_{-8.0}$        |
| $n_s$                                | $0.967^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.087^{+0.069}_{-0.068}$       | $D_M(2.33)$                 | $5823^{+210}_{-230}$         |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.869^{+0.040}_{-0.040}$       | $f\sigma_8(0.15)$           | $0.452^{+0.015}_{-0.014}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{40}$                    | $1220^{+32}_{-31}$              | $\sigma_8(0.15)$            | $0.742^{+0.023}_{-0.022}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                   | $5719^{+77}_{-76}$              | $f\sigma_8(0.38)$           | $0.471^{+0.014}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                   | $2534^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.658^{+0.021}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{1420}$                  | $815.7^{+9.9}_{-10}$            | $f\sigma_8(0.51)$           | $0.469^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.39$                        | $D_{2000}$                  | $230.1^{+4.5}_{-4.4}$           | $\sigma_8(0.51)$            | $0.616^{+0.020}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | $0.967^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | $0.464^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.257^{+0.042}_{-0.046}$       | $\sigma_8(0.61)$            | $0.586^{+0.019}_{-0.018}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.258^{+0.042}_{-0.047}$       | $f\sigma_8(2.33)$           | $0.2954^{+0.0097}_{-0.0095}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.94^{+0.51}_{-0.54}$         | $\sigma_8(2.33)$            | $0.305^{+0.010}_{-0.010}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.0^{+1.2}_{-1.2}$          | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $r_*$                       | $146.3^{+5.2}_{-5.6}$           | $f_{2000}^{217}$            | $107.3^{+5.0}_{-5.0}$        |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.21}$          | $100\theta_*$               | $1.0417^{+0.0019}_{-0.0019}$    | $f_{2000}^{143 \times 217}$ | $33^{+6}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $14.04^{+0.48}_{-0.51}$         | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.6)$           |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.9^{+1.7}_{-1.8}$          | $\chi_{\text{lowl}}^2$      | $22.8 (\nu: 0.7)$            |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | $149.0^{+5.3}_{-5.8}$           | $\chi_{\text{CamSpec}}^2$   | $11515.8 (\nu: 18.0)$        |
| $c_{TE}$                             | $0.997^{+0.010}_{-0.010}$       | $k_D$                       | $0.1390^{+0.0055}_{-0.0049}$    | $\chi_{6\text{DF}}^2$       | $0.057 (\nu: 0.0)$           |
| $c_{EE}$                             | $0.994^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{\text{MGS}}^2$       | $1.33 (\nu: 0.1)$            |
| $H_0$                                | $67.0^{+3.2}_{-3.0}$            | $z_{\text{eq}}$             | $3389^{+65}_{-65}$              | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 1.1)$             |
| $\Omega_\Lambda$                     | $0.689^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | $0.01023^{+0.00033}_{-0.00030}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.1)$             |
| $\Omega_m$                           | $0.311^{+0.014}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.816^{+0.011}_{-0.011}$       | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.7)$             |
| $\Omega_m h^2$                       | $0.1393^{+0.0096}_{-0.0093}$    | $100\theta_{s,\text{eq}}$   | $0.4509^{+0.0057}_{-0.0056}$    | $\chi_{\text{CMB}}^2$       | $11935.5 (\nu: 18.2)$        |
| $\Omega_m h^3$                       | $0.093^{+0.011}_{-0.010}$       | $H(0.15)$                   | $72.2^{+3.3}_{-3.0}$            |                             |                              |
| $\sigma_8$                           | $0.803^{+0.025}_{-0.024}$       | $D_M(0.15)$                 | $648^{+29}_{-30}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11949.50; \Delta\bar{\chi}_{\text{eff}}^2 = 1.52; R - 1 = 0.02228$$



## 9.7 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                       | $0.02221^{+0.00045}_{-0.00044}$ | $\sigma_8$                  | $0.801^{+0.022}_{-0.022}$       | $H(0.15)$                   | $71.1^{+3.8}_{-3.4}$       |
| $\Omega_c h^2$                       | $0.1155^{+0.0096}_{-0.0085}$    | $S_8$                       | $0.827^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | $659^{+34}_{-35}$          |
| $100\theta_{MC}$                     | $1.0419^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.014}_{-0.014}$       | $H(0.38)$                   | $81.1^{+3.9}_{-3.5}$       |
| $\tau$                               | $0.055^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.015}_{-0.014}$       | $D_M(0.38)$                 | $1569^{+77}_{-79}$         |
| $N_{\text{eff}}$                     | $2.76^{+0.62}_{-0.58}$          | $\sigma_8/h^{0.5}$          | $0.988^{+0.019}_{-0.018}$       | $H(0.51)$                   | $87.8^{+4.0}_{-3.6}$       |
| $Y_P$                                | $0.256^{+0.043}_{-0.046}$       | $r_{\text{drag}} h$         | $98.6^{+2.5}_{-2.5}$            | $D_M(0.51)$                 | $2031^{+96}_{-100}$        |
| $\ln(10^{10} A_s)$                   | $3.035^{+0.033}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$ | $2.446^{+0.050}_{-0.050}$       | $H(0.61)$                   | $93.4^{+4.1}_{-3.7}$       |
| $n_s$                                | $0.961^{+0.018}_{-0.018}$       | $z_{\text{re}}$             | $< 8.83$                        | $D_M(0.61)$                 | $2363^{+110}_{-120}$       |
| $y_{\text{cal}}$                     | $1.0006^{+0.0047}_{-0.0049}$    | $10^9 A_s$                  | $2.080^{+0.069}_{-0.064}$       | $H(2.33)$                   | $232.5^{+8.3}_{-7.6}$      |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.864^{+0.039}_{-0.039}$       | $D_M(2.33)$                 | $5881^{+230}_{-240}$       |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1230^{+33}_{-33}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$  |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5717^{+76}_{-76}$              | $\sigma_8(0.15)$            | $0.739^{+0.022}_{-0.021}$  |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                   | $2534^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.012}_{-0.011}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.35$                        | $D_{1420}$                  | $816.1^{+9.8}_{-10}$            | $\sigma_8(0.38)$            | $0.655^{+0.021}_{-0.020}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.6^{+4.4}_{-4.5}$           | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.961^{+0.018}_{-0.018}$       | $\sigma_8(0.51)$            | $0.612^{+0.020}_{-0.019}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.256^{+0.043}_{-0.046}$       | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.011}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.257^{+0.043}_{-0.046}$       | $\sigma_8(0.61)$            | $0.582^{+0.019}_{-0.019}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.37}$          | Age/Gyr                     | $14.08^{+0.55}_{-0.58}$         | $f\sigma_8(2.33)$           | $0.293^{+0.010}_{-0.0097}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                       | $1090.0^{+1.2}_{-1.2}$          | $\sigma_8(2.33)$            | $0.302^{+0.011}_{-0.011}$  |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $r_*$                       | $147.2^{+5.5}_{-5.6}$           | $f_{2000}^{143}$            | $30^{+7}_{-7}$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.32}$          | $100\theta_*$               | $1.0419^{+0.0019}_{-0.0019}$    | $f_{2000}^{217}$            | $106.8^{+5.1}_{-5.0}$      |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $14.13^{+0.50}_{-0.51}$         | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$             |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.5^{+1.9}_{-2.0}$          | $\chi_{\text{lensing}}^2$   | $9.02 (\nu: 0.3)$          |
| $c_{TE}$                             | $0.997^{+0.011}_{-0.010}$       | $r_{\text{drag}}$           | $150.0^{+5.6}_{-5.8}$           | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.4)$         |
| $c_{EE}$                             | $0.992^{+0.012}_{-0.013}$       | $k_D$                       | $0.1383^{+0.0054}_{-0.0048}$    | $\chi_{\text{lowl}}^2$      | $23.7 (\nu: 1.2)$          |
| $H_0$                                | $65.8^{+3.8}_{-3.4}$            | $100\theta_D$               | $0.1608^{+0.0014}_{-0.0014}$    | $\chi_{\text{CamSpec}}^2$   | $11514.6 (\nu: 17.3)$      |
| $\Omega_\Lambda$                     | $0.680^{+0.020}_{-0.022}$       | $z_{\text{eq}}$             | $3422^{+88}_{-85}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$           |
| $\Omega_m$                           | $0.320^{+0.022}_{-0.020}$       | $k_{\text{eq}}$             | $0.01024^{+0.00030}_{-0.00027}$ | $\chi_{\text{CMB}}^2$       | $11944.2 (\nu: 18.4)$      |
| $\Omega_m h^2$                       | $0.1384^{+0.0097}_{-0.0086}$    | $100\theta_{\text{eq}}$     | $0.810^{+0.015}_{-0.015}$       |                             |                            |
| $\Omega_m h^3$                       | $0.0911^{+0.011}_{-0.0097}$     | $100\theta_{s,\text{eq}}$   | $0.4477^{+0.0076}_{-0.0076}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11952.01; \Delta\bar{\chi}_{\text{eff}}^2 = 0.76; R - 1 = 0.01202$$



## 9.8 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02232^{+0.00038}_{-0.00038}$ | $S_8$                       | $0.820^{+0.023}_{-0.022}$       | $H(0.38)$                   | $82.1^{+3.4}_{-3.2}$         |
| $\Omega_c h^2$                       | $0.1164^{+0.0091}_{-0.0088}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1548^{+65}_{-67}$           |
| $100\theta_{MC}$                     | $1.0418^{+0.0026}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.601^{+0.015}_{-0.015}$       | $H(0.51)$                   | $88.7^{+3.6}_{-3.3}$         |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.984^{+0.017}_{-0.017}$       | $D_M(0.51)$                 | $2005^{+83}_{-85}$           |
| $N_{\text{eff}}$                     | $2.87^{+0.58}_{-0.55}$          | $r_{\text{drag}} h$         | $99.6^{+1.7}_{-1.7}$            | $H(0.61)$                   | $94.3^{+3.8}_{-3.4}$         |
| $Y_P$                                | $0.256^{+0.043}_{-0.046}$       | $\langle d^2 \rangle^{1/2}$ | $2.432^{+0.043}_{-0.042}$       | $D_M(0.61)$                 | $2333^{+95}_{-98}$           |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.031}_{-0.029}$       | $z_{\text{re}}$             | $7.9^{+1.2}_{-1.3}$             | $H(2.33)$                   | $233.6^{+8.1}_{-7.3}$        |
| $n_s$                                | $0.966^{+0.015}_{-0.015}$       | $10^9 A_s$                  | $2.093^{+0.065}_{-0.061}$       | $D_M(2.33)$                 | $5828^{+210}_{-220}$         |
| $y_{\text{cal}}$                     | $1.0008^{+0.0047}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.870^{+0.038}_{-0.038}$       | $f\sigma_8(0.15)$           | $0.454^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{40}$                    | $1224^{+31}_{-30}$              | $\sigma_8(0.15)$            | $0.743^{+0.021}_{-0.020}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                   | $5724^{+76}_{-75}$              | $f\sigma_8(0.38)$           | $0.472^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{810}$                   | $2536^{+26}_{-27}$              | $\sigma_8(0.38)$            | $0.659^{+0.019}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{1420}$                  | $816.2^{+9.9}_{-10}$            | $f\sigma_8(0.51)$           | $0.470^{+0.012}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $D_{2000}$                  | $230.3^{+4.5}_{-4.5}$           | $\sigma_8(0.51)$            | $0.616^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.24}$          | $n_{s,0.002}$               | $0.966^{+0.015}_{-0.015}$       | $f\sigma_8(0.61)$           | $0.465^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.256^{+0.043}_{-0.046}$       | $\sigma_8(0.61)$            | $0.586^{+0.017}_{-0.017}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.258^{+0.043}_{-0.046}$       | $f\sigma_8(2.33)$           | $0.2957^{+0.0090}_{-0.0087}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.95^{+0.50}_{-0.53}$         | $\sigma_8(2.33)$            | $0.3048^{+0.0097}_{-0.0094}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | $1090.0^{+1.2}_{-1.2}$          | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.36}_{-0.35}$          | $r_*$                       | $146.3^{+5.1}_{-5.4}$           | $f_{2000}^{217}$            | $107.2^{+5.0}_{-5.0}$        |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | $1.0417^{+0.0018}_{-0.0018}$    | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-5}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $14.05^{+0.46}_{-0.49}$         | $\chi_{\text{lensing}}^2$   | $9.23 (\nu: 0.3)$            |
| $c_{100}$                            | $0.9976^{+0.0020}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.9^{+1.7}_{-1.8}$          | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.8)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $149.0^{+5.2}_{-5.5}$           | $\chi_{\text{lowl}}^2$      | $23.0 (\nu: 0.8)$            |
| $c_{TE}$                             | $0.997^{+0.010}_{-0.010}$       | $k_D$                       | $0.1390^{+0.0052}_{-0.0048}$    | $\chi_{\text{CamSpec}}^2$   | $11515.2 (\nu: 17.8)$        |
| $c_{EE}$                             | $0.993^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | $0.067 (\nu: 0.0)$           |
| $H_0$                                | $66.8^{+3.1}_{-2.9}$            | $z_{\text{eq}}$             | $3394^{+64}_{-66}$              | $\chi_{\text{MGS}}^2$       | $1.23 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | $0.688^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | $0.01024^{+0.00030}_{-0.00028}$ | $\chi_{\text{DR12BAO}}^2$   | $5.0 (\nu: 1.2)$             |
| $\Omega_m$                           | $0.312^{+0.014}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.815^{+0.011}_{-0.011}$       | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$             |
| $\Omega_m h^2$                       | $0.1394^{+0.0092}_{-0.0089}$    | $100\theta_{s,\text{eq}}$   | $0.4504^{+0.0057}_{-0.0055}$    | $\chi_{\text{CMB}}^2$       | $11944.6 (\nu: 18.9)$        |
| $\Omega_m h^3$                       | $0.0932^{+0.010}_{-0.0098}$     | $H(0.15)$                   | $72.1^{+3.2}_{-3.0}$            | $\chi_{\text{BAO}}^2$       | $6.3 (\nu: 0.8)$             |
| $\sigma_8$                           | $0.804^{+0.022}_{-0.021}$       | $D_M(0.15)$                 | $649^{+29}_{-29}$               |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11958.67; \Delta\bar{\chi}_{\text{eff}}^2 = 1.41; R - 1 = 0.01939$$



## 9.9 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.022361 | $0.02219^{+0.00044}_{-0.00042}$ | $\sigma_8$                  | 0.8214   | $0.801^{+0.024}_{-0.024}$       | $H(0.15)$                   | 73.26    | $71.7^{+3.5}_{-3.4}$      |
| $\Omega_c h^2$                       | 0.1208   | $0.1174^{+0.0077}_{-0.0073}$    | $S_8$                       | 0.8367   | $0.826^{+0.031}_{-0.031}$       | $D_M(0.15)$                 | 638.0    | $653^{+33}_{-32}$         |
| $100\theta_{MC}$                     | 1.04069  | $1.0412^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4583   | $0.452^{+0.017}_{-0.017}$       | $H(0.38)$                   | 83.43    | $81.8^{+3.6}_{-3.4}$      |
| $\tau$                               | 0.0637   | $0.052^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6135   | $0.602^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | 1522     | $1556^{+74}_{-73}$        |
| $N_{\text{eff}}$                     | 3.13     | $2.89^{+0.52}_{-0.49}$          | $\sigma_8/h^{0.5}$          | 0.9964   | $0.984^{+0.023}_{-0.023}$       | $H(0.51)$                   | 90.18    | $88.5^{+3.6}_{-3.4}$      |
| $Y_P$                                | 0.2438   | $0.2440^{+0.0077}_{-0.0077}$    | $r_{\text{drag}} h$         | 99.56    | $98.7^{+2.7}_{-2.6}$            | $D_M(0.51)$                 | 1971     | $2014^{+93}_{-91}$        |
| $\ln(10^{10} A_s)$                   | 3.0665   | $3.031^{+0.037}_{-0.038}$       | $\langle d^2 \rangle^{1/2}$ | 2.459    | $2.441^{+0.058}_{-0.060}$       | $H(0.61)$                   | 95.83    | $94.1^{+3.7}_{-3.5}$      |
| $n_s$                                | 0.9690   | $0.960^{+0.018}_{-0.017}$       | $z_{\text{re}}$             | 8.63     | $7.4^{+1.5}_{-1.7}$             | $D_M(0.61)$                 | 2294     | $2343^{+110}_{-100}$      |
| $y_{\text{cal}}$                     | 1.00188  | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | 2.147    | $2.072^{+0.077}_{-0.077}$       | $H(2.33)$                   | 237.3    | $234.1^{+6.8}_{-6.6}$     |
| $A_{100}^{\text{PS}}$                | 233.7    | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8897   | $1.867^{+0.040}_{-0.040}$       | $D_M(2.33)$                 | 5732     | $5835^{+220}_{-210}$      |
| $A_{143}^{\text{PS}}$                | 47.2     | $38^{+20}_{-20}$                | $D_{40}$                    | 1229.3   | $1232^{+31}_{-31}$              | $f\sigma_8(0.15)$           | 0.4629   | $0.456^{+0.016}_{-0.016}$ |
| $A_{217}^{\text{PS}}$                | 105.6    | $103^{+20}_{-30}$               | $D_{220}$                   | 5736     | $5717^{+78}_{-77}$              | $\sigma_8(0.15)$            | 0.7590   | $0.740^{+0.023}_{-0.023}$ |
| $A_{217}^{\text{CIB}}$               | 40.8     | $39^{+10}_{-10}$                | $D_{810}$                   | 2544.7   | $2532^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4816   | $0.473^{+0.014}_{-0.014}$ |
| $A_{143}^{\text{tSZ}}$               | 5.40     | $< 7.51$                        | $D_{1420}$                  | 818.8    | $816.4^{+9.9}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6728   | $0.655^{+0.021}_{-0.021}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.732    | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | 231.31   | $231.0^{+4.0}_{-3.8}$           | $f\sigma_8(0.51)$           | 0.4802   | $0.471^{+0.013}_{-0.013}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.74     | —                               | $n_{s,0.002}$               | 0.9690   | $0.960^{+0.018}_{-0.017}$       | $\sigma_8(0.51)$            | 0.6297   | $0.613^{+0.021}_{-0.020}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.76     | —                               | $Y_P$                       | 0.2438   | $0.2440^{+0.0077}_{-0.0077}$    | $f\sigma_8(0.61)$           | 0.4752   | $0.465^{+0.013}_{-0.013}$ |
| $A^{\text{kSZ}}$                     | 1.7      | —                               | $Y_P^{\text{BBN}}$          | 0.2452   | $0.2454^{+0.0077}_{-0.0077}$    | $\sigma_8(0.61)$            | 0.5991   | $0.583^{+0.020}_{-0.019}$ |
| $A_{100}^{\text{dust}}$              | 1.008    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.72    | $13.97^{+0.51}_{-0.51}$         | $f\sigma_8(2.33)$           | 0.3021   | $0.294^{+0.011}_{-0.010}$ |
| $A_{143}^{\text{dust}}$              | 0.955    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.97  | $1089.80^{+0.73}_{-0.73}$       | $\sigma_8(2.33)$            | 0.3115   | $0.302^{+0.012}_{-0.011}$ |
| $A_{217}^{\text{dust}}$              | 0.978    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 143.85   | $146.1^{+4.7}_{-4.7}$           | $f_{2000}^{143}$            | 29.4     | $29^{+6}_{-6}$            |
| $A_{143 \times 217}^{\text{dust}}$   | 1.021    | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04089  | $1.0415^{+0.0014}_{-0.0014}$    | $f_{2000}^{217}$            | 106.61   | $106.2^{+4.3}_{-4.3}$     |
| $c_{100}$                            | 0.99783  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.820   | $14.03^{+0.43}_{-0.43}$         | $f_{2000}^{143 \times 217}$ | 31.92    | $31^{+5}_{-5}$            |
| $c_{217}$                            | 1.00118  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.93  | $1059.2^{+1.6}_{-1.5}$          | $\chi_{\text{small}}^2$     | 399.05   | $396.8 (\nu: 1.2)$        |
| $c_{TE}$                             | 0.9961   | $0.9958^{+0.0099}_{-0.0098}$    | $r_{\text{drag}}$           | 146.50   | $148.8^{+4.8}_{-4.8}$           | $\chi_{\text{lowl}}^2$      | 23.05    | $23.9 (\nu: 1.0)$         |
| $c_{EE}$                             | 0.9923   | $0.990^{+0.011}_{-0.011}$       | $k_D$                       | 0.14128  | $0.1395^{+0.0037}_{-0.0036}$    | $\chi_{\text{CamSpec}}^2$   | 11499.5  | $11514.4 (\nu: 17.1)$     |
| $H_0$                                | 67.96    | $66.4^{+3.6}_{-3.4}$            | $100\theta_D$               | 0.16091  | $0.16057^{+0.00093}_{-0.00091}$ | $\chi_{\text{Aver15}}^2$    | 0.00     | $0.96 (\nu: 0.9)$         |
| $\Omega_\Lambda$                     | 0.6887   | $0.681^{+0.022}_{-0.023}$       | $z_{\text{eq}}$             | 3383     | $3408^{+82}_{-80}$              | $\chi_{\text{prior}}^2$     | 2.4      | $7.9 (\nu: 6.0)$          |
| $\Omega_m$                           | 0.3113   | $0.319^{+0.023}_{-0.022}$       | $k_{\text{eq}}$             | 0.010381 | $0.01029^{+0.00026}_{-0.00027}$ | $\chi_{\text{CMB}}^2$       | 11921.6  | $11935.1 (\nu: 17.2)$     |
| $\Omega_m h^2$                       | 0.1438   | $0.1402^{+0.0079}_{-0.0076}$    | $100\theta_{\text{eq}}$     | 0.8166   | $0.812^{+0.015}_{-0.015}$       |                             |          |                           |
| $\Omega_m h^3$                       | 0.0977   | $0.0931^{+0.0099}_{-0.0090}$    | $100\theta_{s,\text{eq}}$   | 0.4511   | $0.4488^{+0.0077}_{-0.0076}$    |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 11924.04$ ;  $\bar{\chi}_{\text{eff}}^2 = 11943.94$ ;  $R - 1 = 0.01231$

$\chi_{\text{eff}}^2$ : Abund - Yp\_Aver2015: 0.01 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 399.05 commander\_dx12\_v3.2\_29: 23.05 CamSpec like\_10.7HM\_1400\_unified: 11499.50



## 9.10 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                       | $0.02230^{+0.00036}_{-0.00037}$ | $S_8$                       | $0.817^{+0.026}_{-0.027}$       | $H(0.38)$                   | $82.7^{+3.0}_{-2.8}$       |
| $\Omega_c h^2$                       | $0.1181^{+0.0078}_{-0.0073}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.448^{+0.014}_{-0.015}$       | $D_M(0.38)$                 | $1535^{+58}_{-59}$         |
| $100\theta_{MC}$                     | $1.0410^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.600^{+0.018}_{-0.017}$       | $H(0.51)$                   | $89.4^{+3.1}_{-2.9}$       |
| $\tau$                               | $0.053^{+0.015}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.979^{+0.020}_{-0.021}$       | $D_M(0.51)$                 | $1988^{+73}_{-74}$         |
| $N_{\text{eff}}$                     | $3.00^{+0.48}_{-0.44}$          | $r_{\text{drag}} h$         | $99.7^{+1.7}_{-1.7}$            | $H(0.61)$                   | $95.0^{+3.3}_{-3.1}$       |
| $Y_P$                                | $0.2441^{+0.0076}_{-0.0077}$    | $\langle d^2 \rangle^{1/2}$ | $2.424^{+0.050}_{-0.050}$       | $D_M(0.61)$                 | $2314^{+84}_{-85}$         |
| $\ln(10^{10} A_s)$                   | $3.035^{+0.036}_{-0.035}$       | $z_{\text{re}}$             | $7.5^{+1.5}_{-1.6}$             | $H(2.33)$                   | $235.1^{+6.8}_{-6.4}$      |
| $n_s$                                | $0.966^{+0.014}_{-0.014}$       | $10^9 A_s$                  | $2.081^{+0.076}_{-0.073}$       | $D_M(2.33)$                 | $5785^{+190}_{-190}$       |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | $1.871^{+0.039}_{-0.040}$       | $f\sigma_8(0.15)$           | $0.452^{+0.014}_{-0.014}$  |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                    | $1225^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.742^{+0.023}_{-0.022}$  |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5722^{+74}_{-74}$              | $f\sigma_8(0.38)$           | $0.471^{+0.014}_{-0.014}$  |
| $A_{217}^{\text{PS}}$                | $102^{+20}_{-30}$               | $D_{810}$                   | $2534^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.658^{+0.021}_{-0.020}$  |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $816.4^{+9.6}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.469^{+0.014}_{-0.013}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.48$                        | $D_{2000}$                  | $230.7^{+3.9}_{-3.8}$           | $\sigma_8(0.51)$            | $0.616^{+0.020}_{-0.019}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | $0.966^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | $0.465^{+0.014}_{-0.013}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2441^{+0.0076}_{-0.0077}$    | $\sigma_8(0.61)$            | $0.586^{+0.020}_{-0.018}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2455^{+0.0076}_{-0.0078}$    | $f\sigma_8(2.33)$           | $0.296^{+0.010}_{-0.0092}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.85^{+0.44}_{-0.45}$         | $\sigma_8(2.33)$            | $0.305^{+0.011}_{-0.0099}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | $1089.77^{+0.72}_{-0.71}$       | $f_{2000}^{143}$            | $29^{+7}_{-6}$             |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.34}$          | $r_*$                       | $145.3^{+4.3}_{-4.5}$           | $f_{2000}^{217}$            | $106.5^{+4.3}_{-4.1}$      |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$               | $1.0413^{+0.0013}_{-0.0013}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-4}$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.30}_{-0.33}$          | $D_M(z_*)/\text{Gpc}$       | $13.95^{+0.40}_{-0.41}$         | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.2)$         |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.6^{+1.3}_{-1.4}$          | $\chi_{\text{lowl}}^2$      | $23.1 (\nu: 0.6)$          |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | $148.0^{+4.5}_{-4.6}$           | $\chi_{\text{CamSpec}}^2$   | $11515.0 (\nu: 16.1)$      |
| $c_{TE}$                             | $0.9964^{+0.0096}_{-0.0096}$    | $k_D$                       | $0.1401^{+0.0036}_{-0.0034}$    | $\chi_{\text{Aver15}}^2$    | $0.97 (\nu: 0.9)$          |
| $c_{EE}$                             | $0.992^{+0.011}_{-0.010}$       | $100\theta_D$               | $0.16072^{+0.00088}_{-0.00087}$ | $\chi_{6\text{DF}}^2$       | $0.058 (\nu: 0.0)$         |
| $H_0$                                | $67.4^{+2.9}_{-2.7}$            | $z_{\text{eq}}$             | $3379^{+55}_{-53}$              | $\chi_{\text{MGS}}^2$       | $1.31 (\nu: 0.1)$          |
| $\Omega_\Lambda$                     | $0.689^{+0.014}_{-0.015}$       | $k_{\text{eq}}$             | $0.01028^{+0.00027}_{-0.00026}$ | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 1.2)$           |
| $\Omega_m$                           | $0.311^{+0.015}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.8174^{+0.0099}_{-0.010}$     | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.7)$           |
| $\Omega_m h^2$                       | $0.1411^{+0.0080}_{-0.0074}$    | $100\theta_{s,\text{eq}}$   | $0.4516^{+0.0051}_{-0.0051}$    | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$           |
| $\Omega_m h^3$                       | $0.0951^{+0.0093}_{-0.0083}$    | $H(0.15)$                   | $72.7^{+2.9}_{-2.7}$            | $\chi_{\text{CMB}}^2$       | $11934.9 (\nu: 15.8)$      |
| $\sigma_8$                           | $0.803^{+0.025}_{-0.023}$       | $D_M(0.15)$                 | $643^{+25}_{-26}$               |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11949.86; R - 1 = 0.01509$$



### 9.11 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02216^{+0.00042}_{-0.00042}$ | $\sigma_8$                  | $0.801^{+0.023}_{-0.022}$       | $H(0.15)$                   | $71.4^{+3.5}_{-3.3}$      |
| $\Omega_c h^2$                       | $0.1170^{+0.0076}_{-0.0073}$    | $S_8$                       | $0.828^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | $656^{+33}_{-33}$         |
| $100\theta_{MC}$                     | $1.0412^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.014}_{-0.014}$       | $H(0.38)$                   | $81.5^{+3.5}_{-3.4}$      |
| $\tau$                               | $0.053^{+0.015}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | $1562^{+74}_{-72}$        |
| $N_{\text{eff}}$                     | $2.85^{+0.51}_{-0.49}$          | $\sigma_8/h^{0.5}$          | $0.986^{+0.017}_{-0.018}$       | $H(0.51)$                   | $88.2^{+3.6}_{-3.5}$      |
| $Y_P$                                | $0.2441^{+0.0075}_{-0.0074}$    | $r_{\text{drag}} h$         | $98.5^{+2.5}_{-2.5}$            | $D_M(0.51)$                 | $2022^{+93}_{-91}$        |
| $\ln(10^{10} A_s)$                   | $3.031^{+0.034}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | $2.448^{+0.046}_{-0.048}$       | $H(0.61)$                   | $93.8^{+3.6}_{-3.5}$      |
| $n_s$                                | $0.959^{+0.018}_{-0.017}$       | $z_{\text{re}}$             | $7.5^{+1.4}_{-1.6}$             | $D_M(0.61)$                 | $2352^{+110}_{-100}$      |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.073^{+0.072}_{-0.072}$       | $H(2.33)$                   | $233.7^{+6.8}_{-6.7}$     |
| $A_{100}^{\text{PS}}$                | $236^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.866^{+0.039}_{-0.038}$       | $D_M(2.33)$                 | $5852^{+220}_{-210}$      |
| $A_{143}^{\text{PS}}$                | $37^{+20}_{-20}$                | $D_{40}$                    | $1235^{+29}_{-28}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$ |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5719^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.739^{+0.022}_{-0.021}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.011}_{-0.011}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.49$                        | $D_{1420}$                  | $816.8^{+9.7}_{-9.7}$           | $\sigma_8(0.38)$            | $0.655^{+0.021}_{-0.020}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.3^{+3.9}_{-3.9}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.959^{+0.018}_{-0.017}$       | $\sigma_8(0.51)$            | $0.612^{+0.020}_{-0.019}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2441^{+0.0075}_{-0.0074}$    | $f\sigma_8(0.61)$           | $0.465^{+0.011}_{-0.011}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2454^{+0.0075}_{-0.0075}$    | $\sigma_8(0.61)$            | $0.582^{+0.020}_{-0.019}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | $14.01^{+0.52}_{-0.51}$         | $f\sigma_8(2.33)$           | $0.293^{+0.010}_{-0.010}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.34}$          | $z_*$                       | $1089.78^{+0.69}_{-0.69}$       | $\sigma_8(2.33)$            | $0.302^{+0.011}_{-0.011}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $146.4^{+4.8}_{-4.7}$           | $f_{2000}^{143}$            | $28^{+6}_{-6}$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.0415^{+0.0014}_{-0.0013}$    | $f_{2000}^{217}$            | $106.0^{+4.3}_{-4.2}$     |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $14.06^{+0.44}_{-0.43}$         | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$            |
| $c_{217}$                            | $1.0010^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.1^{+1.5}_{-1.5}$          | $\chi_{\text{lensing}}^2$   | $9.03 (\nu: 0.3)$         |
| $c_{TE}$                             | $0.9955^{+0.0097}_{-0.0098}$    | $r_{\text{drag}}$           | $149.2^{+5.0}_{-4.8}$           | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.1)$        |
| $c_{EE}$                             | $0.990^{+0.011}_{-0.011}$       | $k_D$                       | $0.1393^{+0.0037}_{-0.0037}$    | $\chi_{\text{lowl}}^2$      | $24.1 (\nu: 1.0)$         |
| $H_0$                                | $66.1^{+3.5}_{-3.4}$            | $100\theta_D$               | $0.16050^{+0.00092}_{-0.00090}$ | $\chi_{\text{CamSpec}}^2$   | $11513.6 (\nu: 15.4)$     |
| $\Omega_\Lambda$                     | $0.680^{+0.021}_{-0.022}$       | $z_{\text{eq}}$             | $3415^{+77}_{-77}$              | $\chi_{\text{Aver15}}^2$    | $0.9 (\nu: 0.9)$          |
| $\Omega_m$                           | $0.320^{+0.022}_{-0.021}$       | $k_{\text{eq}}$             | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$          |
| $\Omega_m h^2$                       | $0.1398^{+0.0078}_{-0.0075}$    | $100\theta_{\text{eq}}$     | $0.811^{+0.014}_{-0.014}$       | $\chi_{\text{CMB}}^2$       | $11943.6 (\nu: 16.6)$     |
| $\Omega_m h^3$                       | $0.0924^{+0.0099}_{-0.0091}$    | $100\theta_{s,\text{eq}}$   | $0.4481^{+0.0073}_{-0.0072}$    |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11952.31; R - 1 = 0.01285$$



## 9.12 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02229^{+0.00035}_{-0.00036}$ | $S_8$                       | $0.821^{+0.022}_{-0.022}$       | $H(0.38)$                   | $82.6^{+3.0}_{-2.8}$         |
| $\Omega_c h^2$                       | $0.1180^{+0.0075}_{-0.0069}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1538^{+57}_{-58}$           |
| $100\theta_{MC}$                     | $1.0411^{+0.0012}_{-0.0012}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.015}_{-0.014}$       | $H(0.51)$                   | $89.2^{+3.1}_{-2.9}$         |
| $\tau$                               | $0.055^{+0.014}_{-0.014}$       | $\sigma_8/h^{0.5}$          | $0.982^{+0.016}_{-0.016}$       | $D_M(0.51)$                 | $1993^{+73}_{-74}$           |
| $N_{\text{eff}}$                     | $2.98^{+0.46}_{-0.43}$          | $r_{\text{drag}} h$         | $99.5^{+1.7}_{-1.7}$            | $H(0.61)$                   | $94.8^{+3.2}_{-3.0}$         |
| $Y_P$                                | $0.2441^{+0.0075}_{-0.0077}$    | $\langle d^2 \rangle^{1/2}$ | $2.433^{+0.042}_{-0.041}$       | $D_M(0.61)$                 | $2319^{+83}_{-84}$           |
| $\ln(10^{10} A_s)$                   | $3.039^{+0.031}_{-0.031}$       | $z_{\text{re}}$             | $7.7^{+1.3}_{-1.4}$             | $H(2.33)$                   | $234.9^{+6.6}_{-6.1}$        |
| $n_s$                                | $0.964^{+0.014}_{-0.014}$       | $10^9 A_s$                  | $2.089^{+0.066}_{-0.063}$       | $D_M(2.33)$                 | $5793^{+180}_{-180}$         |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.872^{+0.037}_{-0.036}$       | $f\sigma_8(0.15)$           | $0.454^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $D_{40}$                    | $1228^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.744^{+0.021}_{-0.019}$    |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{220}$                   | $5726^{+73}_{-74}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.659^{+0.019}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $816.9^{+9.7}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.50$                        | $D_{2000}$                  | $230.9^{+3.9}_{-3.8}$           | $\sigma_8(0.51)$            | $0.617^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | $0.964^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | $0.466^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2441^{+0.0075}_{-0.0077}$    | $\sigma_8(0.61)$            | $0.587^{+0.018}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2454^{+0.0075}_{-0.0078}$    | $f\sigma_8(2.33)$           | $0.2960^{+0.0093}_{-0.0085}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.87^{+0.43}_{-0.44}$         | $\sigma_8(2.33)$            | $0.305^{+0.010}_{-0.0091}$   |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | $1089.77^{+0.69}_{-0.69}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.34}_{-0.34}$          | $r_*$                       | $145.4^{+4.2}_{-4.3}$           | $f_{2000}^{217}$            | $106.4^{+4.2}_{-4.1}$        |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $100\theta_*$               | $1.0413^{+0.0013}_{-0.0013}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-4}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.30}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | $13.96^{+0.39}_{-0.40}$         | $\chi_{\text{lensing}}^2$   | $9.26 (\nu: 0.3)$            |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.5^{+1.4}_{-1.3}$          | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.3)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | $148.1^{+4.4}_{-4.4}$           | $\chi_{\text{lowl}}^2$      | $23.3 (\nu: 0.6)$            |
| $c_{TE}$                             | $0.9962^{+0.0095}_{-0.0096}$    | $k_D$                       | $0.1401^{+0.0035}_{-0.0033}$    | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 15.2)$        |
| $c_{EE}$                             | $0.991^{+0.011}_{-0.010}$       | $100\theta_D$               | $0.16068^{+0.00087}_{-0.00085}$ | $\chi_{\text{Aver15}}^2$    | $0.96 (\nu: 0.9)$            |
| $H_0$                                | $67.2^{+2.8}_{-2.6}$            | $z_{\text{eq}}$             | $3385^{+53}_{-54}$              | $\chi_{6\text{DF}}^2$       | $0.068 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.688^{+0.014}_{-0.014}$       | $k_{\text{eq}}$             | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\text{MGS}}^2$       | $1.22 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.312^{+0.014}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.8163^{+0.0099}_{-0.0098}$    | $\chi_{\text{DR12BAO}}^2$   | $5.0 (\nu: 1.3)$             |
| $\Omega_m h^2$                       | $0.1410^{+0.0078}_{-0.0071}$    | $100\theta_{s,\text{eq}}$   | $0.4510^{+0.0051}_{-0.0049}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^3$                       | $0.0948^{+0.0090}_{-0.0080}$    | $H(0.15)$                   | $72.5^{+2.8}_{-2.7}$            | $\chi_{\text{CMB}}^2$       | $11943.7 (\nu: 15.9)$        |
| $\sigma_8$                           | $0.805^{+0.022}_{-0.020}$       | $D_M(0.15)$                 | $645^{+25}_{-25}$               | $\chi_{\text{BAO}}^2$       | $6.3 (\nu: 0.9)$             |

$$\bar{\chi}_{\text{eff}}^2 = 11958.76; R - 1 = 0.01459$$



### 9.13 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                       | $0.02220^{+0.00044}_{-0.00042}$ | $\sigma_8$                  | $0.803^{+0.023}_{-0.022}$       | $H(0.15)$                   | $71.7^{+3.5}_{-3.3}$       |
| $\Omega_c h^2$                       | $0.1175^{+0.0076}_{-0.0074}$    | $S_8$                       | $0.826^{+0.031}_{-0.031}$       | $D_M(0.15)$                 | $652^{+33}_{-32}$          |
| $100\theta_{MC}$                     | $1.0412^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.017}_{-0.017}$       | $H(0.38)$                   | $81.9^{+3.5}_{-3.3}$       |
| $\tau$                               | $0.054^{+0.012}_{-0.011}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | $1554^{+73}_{-72}$         |
| $N_{\text{eff}}$                     | $2.90^{+0.52}_{-0.49}$          | $\sigma_8/h^{0.5}$          | $0.985^{+0.022}_{-0.022}$       | $H(0.51)$                   | $88.6^{+3.6}_{-3.4}$       |
| $Y_P$                                | $0.2441^{+0.0077}_{-0.0077}$    | $r_{\text{drag}} h$         | $98.8^{+2.7}_{-2.5}$            | $D_M(0.51)$                 | $2012^{+92}_{-90}$         |
| $\ln(10^{10} A_s)$                   | $3.035^{+0.034}_{-0.030}$       | $\langle d^2 \rangle^{1/2}$ | $2.444^{+0.057}_{-0.058}$       | $H(0.61)$                   | $94.2^{+3.6}_{-3.5}$       |
| $n_s$                                | $0.961^{+0.018}_{-0.017}$       | $z_{\text{re}}$             | $< 8.72$                        | $D_M(0.61)$                 | $2341^{+100}_{-100}$       |
| $y_{\text{cal}}$                     | $1.0004^{+0.0050}_{-0.0048}$    | $10^9 A_s$                  | $2.079^{+0.068}_{-0.065}$       | $H(2.33)$                   | $234.2^{+6.8}_{-6.6}$      |
| $A_{100}^{\text{PS}}$                | $237^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.867^{+0.040}_{-0.040}$       | $D_M(2.33)$                 | $5831^{+210}_{-210}$       |
| $A_{143}^{\text{PS}}$                | $38^{+20}_{-20}$                | $D_{40}$                    | $1232^{+31}_{-31}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$  |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5716^{+79}_{-76}$              | $\sigma_8(0.15)$            | $0.741^{+0.022}_{-0.021}$  |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2532^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.014}_{-0.014}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.53$                        | $D_{1420}$                  | $816.4^{+9.8}_{-9.5}$           | $\sigma_8(0.38)$            | $0.656^{+0.021}_{-0.020}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.0^{+4.0}_{-3.8}$           | $f\sigma_8(0.51)$           | $0.471^{+0.013}_{-0.013}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.961^{+0.018}_{-0.017}$       | $\sigma_8(0.51)$            | $0.614^{+0.020}_{-0.019}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2441^{+0.0077}_{-0.0077}$    | $f\sigma_8(0.61)$           | $0.466^{+0.013}_{-0.012}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2454^{+0.0077}_{-0.0077}$    | $\sigma_8(0.61)$            | $0.584^{+0.019}_{-0.018}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | $13.96^{+0.51}_{-0.50}$         | $f\sigma_8(2.33)$           | $0.294^{+0.010}_{-0.0095}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | $1089.80^{+0.74}_{-0.73}$       | $\sigma_8(2.33)$            | $0.303^{+0.011}_{-0.010}$  |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $146.0^{+4.7}_{-4.7}$           | $f_{2000}^{143}$            | $29^{+6}_{-6}$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.0414^{+0.0014}_{-0.0014}$    | $f_{2000}^{217}$            | $106.1^{+4.3}_{-4.3}$      |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $14.02^{+0.43}_{-0.43}$         | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$             |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.3^{+1.5}_{-1.5}$          | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.2)$         |
| $c_{TE}$                             | $0.9957^{+0.0099}_{-0.0099}$    | $r_{\text{drag}}$           | $148.8^{+4.9}_{-4.8}$           | $\chi_{\text{lowl}}^2$      | $23.9 (\nu: 1.0)$          |
| $c_{EE}$                             | $0.990^{+0.011}_{-0.011}$       | $k_D$                       | $0.1396^{+0.0037}_{-0.0036}$    | $\chi_{\text{CamSpec}}^2$   | $11514.2 (\nu: 17.2)$      |
| $H_0$                                | $66.5^{+3.5}_{-3.3}$            | $100\theta_D$               | $0.16057^{+0.00093}_{-0.00091}$ | $\chi_{\text{Aver15}}^2$    | $0.96 (\nu: 0.9)$          |
| $\Omega_\Lambda$                     | $0.682^{+0.021}_{-0.022}$       | $z_{\text{eq}}$             | $3406^{+79}_{-80}$              | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.0)$           |
| $\Omega_m$                           | $0.318^{+0.022}_{-0.021}$       | $k_{\text{eq}}$             | $0.01029^{+0.00026}_{-0.00027}$ | $\chi_{\text{CMB}}^2$       | $11934.8 (\nu: 16.9)$      |
| $\Omega_m h^2$                       | $0.1403^{+0.0079}_{-0.0076}$    | $100\theta_{\text{eq}}$     | $0.812^{+0.015}_{-0.015}$       |                             |                            |
| $\Omega_m h^3$                       | $0.0933^{+0.0098}_{-0.0090}$    | $100\theta_{s,\text{eq}}$   | $0.4490^{+0.0077}_{-0.0074}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11943.65; R - 1 = 0.01349$$



# 9.14 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02230^{+0.00036}_{-0.00037}$ | $S_8$                                | $0.818^{+0.026}_{-0.026}$       | $H(0.38)$                   | $82.7^{+3.0}_{-2.8}$         |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1182^{+0.0078}_{-0.0072}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.448^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$      | $1534^{+58}_{-59}$           |
| $100\theta_{\mathrm{MC}}$                | $1.0410^{+0.0013}_{-0.0013}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.600^{+0.017}_{-0.016}$       | $H(0.51)$                   | $89.4^{+3.2}_{-2.9}$         |
| $\tau$                                   | $0.055^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$                   | $0.980^{+0.019}_{-0.018}$       | $D_{\mathrm{M}}(0.51)$      | $1988^{+73}_{-75}$           |
| $N_{\mathrm{eff}}$                       | $3.00^{+0.49}_{-0.44}$          | $r_{\mathrm{drag}}h$                 | $99.7^{+1.7}_{-1.7}$            | $H(0.61)$                   | $95.0^{+3.3}_{-3.0}$         |
| $Y_{\mathrm{P}}$                         | $0.2441^{+0.0076}_{-0.0077}$    | $\langle d^2 \rangle^{1/2}$          | $2.427^{+0.048}_{-0.046}$       | $D_{\mathrm{M}}(0.61)$      | $2313^{+83}_{-85}$           |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.038^{+0.032}_{-0.030}$       | $z_{\mathrm{re}}$                    | $< 8.78$                        | $H(2.33)$                   | $235.1^{+6.8}_{-6.3}$        |
| $n_{\mathrm{s}}$                         | $0.966^{+0.014}_{-0.014}$       | $10^9 A_{\mathrm{s}}$                | $2.087^{+0.067}_{-0.063}$       | $D_{\mathrm{M}}(2.33)$      | $5784^{+180}_{-190}$         |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0048}_{-0.0047}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.871^{+0.039}_{-0.040}$       | $f\sigma_8(0.15)$           | $0.453^{+0.014}_{-0.014}$    |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{40}$                             | $1225^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.744^{+0.023}_{-0.020}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                            | $5721^{+75}_{-73}$              | $f\sigma_8(0.38)$           | $0.471^{+0.014}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+20}_{-30}$               | $D_{810}$                            | $2533^{+26}_{-27}$              | $\sigma_8(0.38)$            | $0.659^{+0.021}_{-0.019}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                           | $816.4^{+9.5}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.470^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.48$                        | $D_{2000}$                           | $230.7^{+3.8}_{-3.9}$           | $\sigma_8(0.51)$            | $0.617^{+0.020}_{-0.018}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$               | $0.966^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | $0.465^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.2441^{+0.0076}_{-0.0077}$    | $\sigma_8(0.61)$            | $0.587^{+0.019}_{-0.017}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.2454^{+0.0076}_{-0.0077}$    | $f\sigma_8(2.33)$           | $0.2961^{+0.0098}_{-0.0087}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                              | $13.85^{+0.43}_{-0.45}$         | $\sigma_8(2.33)$            | $0.305^{+0.011}_{-0.0093}$   |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $z_*$                                | $1089.77^{+0.72}_{-0.71}$       | $f_{2000}^{143}$            | $29^{+7}_{-6}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $r_*$                                | $145.3^{+4.3}_{-4.5}$           | $f_{2000}^{217}$            | $106.4^{+4.3}_{-4.2}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $100\theta_*$                        | $1.0413^{+0.0013}_{-0.0014}$    | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-5}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.30}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.95^{+0.40}_{-0.41}$         | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.2)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                  | $1059.6^{+1.4}_{-1.4}$          | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 0.6)$            |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                  | $147.9^{+4.5}_{-4.6}$           | $\chi_{\mathrm{CamSpec}}^2$ | $11514.8 (\nu: 16.2)$        |
| $c_{TE}$                                 | $0.9964^{+0.0096}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.1402^{+0.0037}_{-0.0034}$    | $\chi_{\mathrm{Aver15}}^2$  | $0.96 (\nu: 0.9)$            |
| $c_{EE}$                                 | $0.992^{+0.011}_{-0.010}$       | $100\theta_{\mathrm{D}}$             | $0.16072^{+0.00089}_{-0.00087}$ | $\chi_{6\mathrm{DF}}^2$     | $0.056 (\nu: 0.0)$           |
| $H_0$                                    | $67.4^{+2.9}_{-2.6}$            | $z_{\mathrm{eq}}$                    | $3378^{+55}_{-53}$              | $\chi_{\mathrm{MGS}}^2$     | $1.33 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                    | $0.01028^{+0.00026}_{-0.00026}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.1)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{eq}}$            | $0.8175^{+0.0099}_{-0.010}$     | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.7)$             |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1411^{+0.0080}_{-0.0074}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4516^{+0.0051}_{-0.0051}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0952^{+0.0095}_{-0.0082}$    | $H(0.15)$                            | $72.7^{+2.9}_{-2.7}$            | $\chi_{\mathrm{CMB}}^2$     | $11934.7 (\nu: 15.7)$        |
| $\sigma_8$                               | $0.805^{+0.024}_{-0.022}$       | $D_{\mathrm{M}}(0.15)$               | $643^{+25}_{-26}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.59; R - 1 = 0.01728$$



# 9.15 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                 |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|----------------------------|
| $\Omega_b h^2$                       | $0.02217^{+0.00042}_{-0.00042}$ | $\sigma_8$                  | $0.802^{+0.022}_{-0.021}$       | $H(0.15)$                   | $71.5^{+3.5}_{-3.3}$       |
| $\Omega_c h^2$                       | $0.1170^{+0.0075}_{-0.0074}$    | $S_8$                       | $0.828^{+0.024}_{-0.025}$       | $D_M(0.15)$                 | $655^{+32}_{-32}$          |
| $100\theta_{MC}$                     | $1.0412^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.013}_{-0.014}$       | $H(0.38)$                   | $81.6^{+3.5}_{-3.4}$       |
| $\tau$                               | $0.054^{+0.012}_{-0.011}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | $1560^{+73}_{-72}$         |
| $N_{\text{eff}}$                     | $2.86^{+0.51}_{-0.49}$          | $\sigma_8/h^{0.5}$          | $0.986^{+0.017}_{-0.017}$       | $H(0.51)$                   | $88.3^{+3.5}_{-3.4}$       |
| $Y_P$                                | $0.2441^{+0.0075}_{-0.0074}$    | $r_{\text{drag}} h$         | $98.6^{+2.4}_{-2.3}$            | $D_M(0.51)$                 | $2020^{+92}_{-91}$         |
| $\ln(10^{10} A_s)$                   | $3.034^{+0.032}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$ | $2.449^{+0.045}_{-0.048}$       | $H(0.61)$                   | $93.9^{+3.6}_{-3.5}$       |
| $n_s$                                | $0.959^{+0.017}_{-0.017}$       | $z_{\text{re}}$             | $< 8.68$                        | $D_M(0.61)$                 | $2349^{+100}_{-100}$       |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | $2.079^{+0.067}_{-0.059}$       | $H(2.33)$                   | $233.8^{+6.7}_{-6.8}$      |
| $A_{100}^{\text{PS}}$                | $236^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.866^{+0.039}_{-0.038}$       | $D_M(2.33)$                 | $5848^{+220}_{-210}$       |
| $A_{143}^{\text{PS}}$                | $37^{+20}_{-20}$                | $D_{40}$                    | $1235^{+28}_{-28}$              | $f\sigma_8(0.15)$           | $0.457^{+0.012}_{-0.013}$  |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5719^{+74}_{-74}$              | $\sigma_8(0.15)$            | $0.740^{+0.022}_{-0.020}$  |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.474^{+0.011}_{-0.011}$  |
| $A_{143}^{\text{tSZ}}$               | $< 7.50$                        | $D_{1420}$                  | $816.7^{+9.7}_{-9.6}$           | $\sigma_8(0.38)$            | $0.656^{+0.020}_{-0.019}$  |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.25}_{-0.26}$          | $D_{2000}$                  | $231.2^{+4.0}_{-3.9}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$  |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.959^{+0.017}_{-0.017}$       | $\sigma_8(0.51)$            | $0.613^{+0.020}_{-0.018}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2441^{+0.0075}_{-0.0074}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2454^{+0.0075}_{-0.0074}$    | $\sigma_8(0.61)$            | $0.583^{+0.019}_{-0.018}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | $14.00^{+0.51}_{-0.51}$         | $f\sigma_8(2.33)$           | $0.294^{+0.010}_{-0.0093}$ |
| $A_{143}^{\text{dust}}$              | $0.95^{+0.35}_{-0.34}$          | $z_*$                       | $1089.77^{+0.68}_{-0.69}$       | $\sigma_8(2.33)$            | $0.303^{+0.011}_{-0.010}$  |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | $146.4^{+4.8}_{-4.7}$           | $f_{2000}^{143}$            | $28^{+6}_{-6}$             |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | $1.0415^{+0.0014}_{-0.0013}$    | $f_{2000}^{217}$            | $106.0^{+4.3}_{-4.2}$      |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $14.05^{+0.45}_{-0.43}$         | $f_{2000}^{143 \times 217}$ | $31^{+5}_{-5}$             |
| $c_{217}$                            | $1.0010^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.1^{+1.5}_{-1.5}$          | $\chi_{\text{lensing}}^2$   | $8.99 (\nu: 0.2)$          |
| $c_{TE}$                             | $0.9955^{+0.0097}_{-0.0098}$    | $r_{\text{drag}}$           | $149.1^{+5.0}_{-4.9}$           | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.1)$         |
| $c_{EE}$                             | $0.990^{+0.011}_{-0.011}$       | $k_D$                       | $0.1393^{+0.0037}_{-0.0037}$    | $\chi_{\text{lowl}}^2$      | $24.1 (\nu: 0.9)$          |
| $H_0$                                | $66.2^{+3.5}_{-3.3}$            | $100\theta_D$               | $0.16051^{+0.00091}_{-0.00089}$ | $\chi_{\text{CamSpec}}^2$   | $11513.5 (\nu: 15.4)$      |
| $\Omega_\Lambda$                     | $0.680^{+0.020}_{-0.020}$       | $z_{\text{eq}}$             | $3412^{+74}_{-75}$              | $\chi_{\text{Aver15}}^2$    | $0.9 (\nu: 0.9)$           |
| $\Omega_m$                           | $0.320^{+0.020}_{-0.020}$       | $k_{\text{eq}}$             | $0.01028^{+0.00024}_{-0.00024}$ | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.9)$           |
| $\Omega_m h^2$                       | $0.1398^{+0.0077}_{-0.0076}$    | $100\theta_{\text{eq}}$     | $0.811^{+0.014}_{-0.013}$       | $\chi_{\text{CMB}}^2$       | $11943.3 (\nu: 16.2)$      |
| $\Omega_m h^3$                       | $0.0926^{+0.0099}_{-0.0091}$    | $100\theta_{s,\text{eq}}$   | $0.4484^{+0.0072}_{-0.0067}$    |                             |                            |

$$\bar{\chi}_{\text{eff}}^2 = 11952.02; R - 1 = 0.01312$$



9.16 base\_nnu\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02229^{+0.00035}_{-0.00037}$ | $S_8$                                 | $0.821^{+0.022}_{-0.022}$       | $H(0.38)$                   | $82.6^{+3.0}_{-2.8}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1180^{+0.0075}_{-0.0069}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1538^{+57}_{-58}$           |
| $100\theta_{\mathrm{MC}}$                | $1.0411^{+0.0012}_{-0.0012}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.602^{+0.015}_{-0.014}$       | $H(0.51)$                   | $89.2^{+3.1}_{-2.9}$         |
| $\tau$                                   | $0.056^{+0.012}_{-0.012}$       | $\sigma_8/h^{0.5}$                    | $0.982^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.51)$      | $1993^{+73}_{-74}$           |
| $N_{\mathrm{eff}}$                       | $2.98^{+0.47}_{-0.43}$          | $r_{\mathrm{drag}} h$                 | $99.6^{+1.7}_{-1.7}$            | $H(0.61)$                   | $94.8^{+3.2}_{-3.0}$         |
| $Y_{\mathrm{P}}$                         | $0.2441^{+0.0075}_{-0.0077}$    | $\langle d^2 \rangle^{1/2}$           | $2.435^{+0.042}_{-0.040}$       | $D_{\mathrm{M}}(0.61)$      | $2319^{+83}_{-85}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.031}_{-0.028}$       | $z_{\mathrm{re}}$                     | $7.8^{+1.1}_{-1.3}$             | $H(2.33)$                   | $234.9^{+6.6}_{-6.1}$        |
| $n_{\mathrm{s}}$                         | $0.965^{+0.014}_{-0.014}$       | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.062}_{-0.060}$       | $D_{\mathrm{M}}(2.33)$      | $5793^{+180}_{-190}$         |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0048}_{-0.0047}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.871^{+0.037}_{-0.036}$       | $f\sigma_8(0.15)$           | $0.454^{+0.012}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $237^{+50}_{-50}$               | $D_{40}$                              | $1228^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.744^{+0.021}_{-0.019}$    |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                             | $5726^{+73}_{-73}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+20}_{-30}$               | $D_{810}$                             | $2535^{+25}_{-26}$              | $\sigma_8(0.38)$            | $0.660^{+0.019}_{-0.018}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $816.8^{+9.5}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $D_{2000}$                            | $231.0^{+3.9}_{-3.8}$           | $\sigma_8(0.51)$            | $0.617^{+0.018}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.965^{+0.014}_{-0.014}$       | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2441^{+0.0075}_{-0.0077}$    | $\sigma_8(0.61)$            | $0.587^{+0.018}_{-0.016}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2454^{+0.0075}_{-0.0077}$    | $f\sigma_8(2.33)$           | $0.2962^{+0.0093}_{-0.0084}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.87^{+0.43}_{-0.44}$         | $\sigma_8(2.33)$            | $0.305^{+0.010}_{-0.0090}$   |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $z_*$                                 | $1089.76^{+0.69}_{-0.69}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.34}_{-0.34}$          | $r_*$                                 | $145.4^{+4.2}_{-4.3}$           | $f_{2000}^{217}$            | $106.4^{+4.2}_{-4.1}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.21}_{-0.20}$          | $100\theta_*$                         | $1.0413^{+0.0013}_{-0.0013}$    | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.30}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.96^{+0.39}_{-0.40}$         | $\chi_{\mathrm{lensing}}^2$ | $9.21 (\nu: 0.3)$            |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.5^{+1.4}_{-1.3}$          | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $148.1^{+4.3}_{-4.4}$           | $\chi_{\mathrm{lowl}}^2$    | $23.3 (\nu: 0.6)$            |
| $c_{TE}$                                 | $0.9962^{+0.0095}_{-0.0097}$    | $k_{\mathrm{D}}$                      | $0.1401^{+0.0035}_{-0.0033}$    | $\chi_{\mathrm{CamSpec}}^2$ | $11514.1 (\nu: 15.2)$        |
| $c_{EE}$                                 | $0.991^{+0.011}_{-0.010}$       | $100\theta_{\mathrm{D}}$              | $0.16067^{+0.00088}_{-0.00085}$ | $\chi_{\mathrm{Aver15}}^2$  | $0.96 (\nu: 0.9)$            |
| $H_0$                                    | $67.2^{+2.8}_{-2.6}$            | $z_{\mathrm{eq}}$                     | $3384^{+53}_{-53}$              | $\chi_{6\mathrm{DF}}^2$     | $0.066 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.688^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01028^{+0.00025}_{-0.00024}$ | $\chi_{\mathrm{MGS}}^2$     | $1.23 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}$                    | $0.312^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{eq}}$             | $0.816^{+0.010}_{-0.0098}$      | $\chi_{\mathrm{DR12BAO}}^2$ | $5.0 (\nu: 1.3)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1409^{+0.0078}_{-0.0071}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4511^{+0.0050}_{-0.0049}$    | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0948^{+0.0090}_{-0.0080}$    | $H(0.15)$                             | $72.5^{+2.8}_{-2.7}$            | $\chi_{\mathrm{CMB}}^2$     | $11943.6 (\nu: 15.8)$        |
| $\sigma_8$                               | $0.805^{+0.022}_{-0.020}$       | $D_{\mathrm{M}}(0.15)$                | $645^{+25}_{-25}$               | $\chi_{\mathrm{BAO}}^2$     | $6.3 (\nu: 0.9)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.57; R - 1 = 0.01608$$



## 10 nrun

### 10.1 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022152 | $0.02216^{+0.00045}_{-0.00047}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4596   | $0.459^{+0.026}_{-0.025}$       | $H(0.15)$                   | 72.28    | $72.3^{+1.6}_{-1.5}$         |
| $\Omega_c h^2$              | 0.12068  | $0.1206^{+0.0042}_{-0.0040}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6108   | $0.610^{+0.023}_{-0.023}$       | $D_M(0.15)$                 | 647.3    | $647^{+16}_{-16}$            |
| $100\theta_{MC}$            | 1.04082  | $1.04084^{+0.00094}_{-0.00093}$ | $\sigma_8/h^{0.5}$          | 0.9925   | $0.991^{+0.032}_{-0.031}$       | $H(0.38)$                   | 82.55    | $82.6^{+1.1}_{-1.1}$         |
| $\tau$                      | 0.0529   | $0.053^{+0.017}_{-0.016}$       | $r_{drag}h$                 | 98.46    | $98.6^{+3.2}_{-3.2}$            | $D_M(0.38)$                 | 1541.6   | $1541^{+31}_{-31}$           |
| $\ln(10^{10} A_s)$          | 3.0419   | $3.041^{+0.037}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | 2.448    | $2.445^{+0.076}_{-0.074}$       | $H(0.51)$                   | 89.35    | $89.39^{+0.90}_{-0.87}$      |
| $n_s$                       | 0.9624   | $0.963^{+0.012}_{-0.012}$       | $z_{re}$                    | 7.59     | $7.6^{+1.7}_{-1.7}$             | $D_M(0.51)$                 | 1995.6   | $1994^{+37}_{-37}$           |
| $dn_s/d \ln k$              | -0.0033  | $-0.003^{+0.015}_{-0.015}$      | $10^9 A_s$                  | 2.094    | $2.094^{+0.078}_{-0.072}$       | $H(0.61)$                   | 95.04    | $95.07^{+0.73}_{-0.70}$      |
| $y_{cal}$                   | 1.00058  | $1.0004^{+0.0050}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8842   | $1.883^{+0.029}_{-0.028}$       | $D_M(0.61)$                 | 2321.0   | $2320^{+39}_{-39}$           |
| $A_{100}^{PS}$              | 245.0    | $244^{+50}_{-50}$               | $D_{40}$                    | 1224.5   | $1223^{+42}_{-41}$              | $H(2.33)$                   | 236.78   | $236.7^{+2.6}_{-2.5}$        |
| $A_{143}^{PS}$              | 39.9     | $42^{+20}_{-20}$                | $D_{220}$                   | 5706     | $5704^{+82}_{-80}$              | $D_M(2.33)$                 | 5775.7   | $5775^{+33}_{-33}$           |
| $A_{217}^{PS}$              | 98.4     | $100^{+30}_{-30}$               | $D_{810}$                   | 2535.5   | $2535^{+29}_{-28}$              | $f\sigma_8(0.15)$           | 0.4634   | $0.463^{+0.024}_{-0.023}$    |
| $A_{217}^{CIB}$             | 45.4     | $42^{+20}_{-10}$                | $D_{1420}$                  | 813.5    | $814^{+11}_{-10}$               | $\sigma_8(0.15)$            | 0.7493   | $0.749^{+0.015}_{-0.015}$    |
| $A_{143}^{tSZ}$             | 5.16     | $< 7.33$                        | $D_{2000}$                  | 229.09   | $229.1^{+4.0}_{-3.9}$           | $f\sigma_8(0.38)$           | 0.4798   | $0.479^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{PS}$   | 0.549    | $0.64^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9730   | $0.974^{+0.046}_{-0.046}$       | $\sigma_8(0.38)$            | 0.6632   | $0.663^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{CIB}$  | 0.74     | —                               | $Y_P$                       | 0.245306 | $0.24530^{+0.00019}_{-0.00021}$ | $f\sigma_8(0.51)$           | 0.4773   | $0.477^{+0.016}_{-0.016}$    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $Y_P^{BBN}$                 | 0.246632 | $0.24663^{+0.00019}_{-0.00021}$ | $\sigma_8(0.51)$            | 0.6202   | $0.620^{+0.011}_{-0.011}$    |
| $A^{kSZ}$                   | 2.6      | —                               | $10^5 D/H$                  | 2.627    | $2.626^{+0.090}_{-0.084}$       | $f\sigma_8(0.61)$           | 0.4716   | $0.471^{+0.014}_{-0.014}$    |
| $A_{100}^{dust}$            | 1.017    | $1.02^{+0.38}_{-0.39}$          | Age/Gyr                     | 13.825   | $13.823^{+0.074}_{-0.074}$      | $\sigma_8(0.61)$            | 0.5899   | $0.590^{+0.011}_{-0.010}$    |
| $A_{143}^{dust}$            | 0.986    | $0.98^{+0.34}_{-0.35}$          | $z_*$                       | 1090.26  | $1090.24^{+0.84}_{-0.80}$       | $f\sigma_8(2.33)$           | 0.2971   | $0.2970^{+0.0053}_{-0.0051}$ |
| $A_{217}^{dust}$            | 0.961    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.42   | $144.45^{+0.95}_{-0.98}$        | $\sigma_8(2.33)$            | 0.3059   | $0.3059^{+0.0056}_{-0.0054}$ |
| $A_{143 \times 217}^{dust}$ | 1.002    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04103  | $1.04105^{+0.00092}_{-0.00092}$ | $f_{2000}^{143}$            | 32.0     | $32^{+7}_{-7}$               |
| $c_{100}$                   | 0.99751  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.873   | $13.876^{+0.087}_{-0.090}$      | $f_{2000}^{217}$            | 108.26   | $108.0^{+4.3}_{-4.4}$        |
| $c_{217}$                   | 1.00149  | $1.0013^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.47  | $1059.49^{+0.94}_{-0.97}$       | $f_{2000}^{143 \times 217}$ | 33.66    | $34^{+5}_{-5}$               |
| $H_0$                       | 66.91    | $67.0^{+1.8}_{-1.8}$            | $r_{drag}$                  | 147.16   | $147.18^{+0.96}_{-0.99}$        | $\chi_{simall}^2$           | 395.90   | $397.0 (\nu: 1.6)$           |
| $\Omega_\Lambda$            | 0.6795   | $0.680^{+0.025}_{-0.027}$       | $k_D$                       | 0.14063  | $0.1406^{+0.0011}_{-0.0011}$    | $\chi_{lowl}^2$             | 22.73    | $23.1 (\nu: 2.2)$            |
| $\Omega_m$                  | 0.3205   | $0.320^{+0.027}_{-0.025}$       | $100\theta_D$               | 0.16103  | $0.16103^{+0.00057}_{-0.00055}$ | $\chi_{CamSpec}^2$          | 7050.5   | $7064.2 (\nu: 16.0)$         |
| $\Omega_m h^2$              | 0.14347  | $0.1434^{+0.0040}_{-0.0038}$    | $z_{eq}$                    | 3413     | $3410^{+96}_{-92}$              | $\chi_{prior}^2$            | 2.4      | $7.7 (\nu: 6.1)$             |
| $\Omega_m h^3$              | 0.09599  | $0.09599^{+0.00097}_{-0.00096}$ | $k_{eq}$                    | 0.010417 | $0.01041^{+0.00029}_{-0.00028}$ | $\chi_{CMB}^2$              | 7469.1   | $7484.4 (\nu: 15.9)$         |
| $\sigma_8$                  | 0.8118   | $0.811^{+0.018}_{-0.018}$       | $100\theta_{eq}$            | 0.8107   | $0.811^{+0.017}_{-0.018}$       |                             |          |                              |
| $S_8$                       | 0.8391   | $0.838^{+0.048}_{-0.046}$       | $100\theta_{s,eq}$          | 0.4482   | $0.4485^{+0.0090}_{-0.0090}$    |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7471.52$ ;  $\Delta\chi_{eff}^2 = -0.22$ ;  $\bar{\chi}_{eff}^2 = 7492.14$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.60$ ;  $R - 1 = 0.00818$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.90 ( $\Delta$  0.07) commander\_dx12\_v3.2.29: 22.73 ( $\Delta$  -0.67) CamSpec like\_10.7HM: 7050.50 ( $\Delta$  0.16)



## 10.2 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02225^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.602^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.01^{+0.70}_{-0.69}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1189^{+0.0024}_{-0.0023}$    | $\sigma_8/h^{0.5}$                    | $0.981^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+19}_{-19}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04106^{+0.00085}_{-0.00081}$ | $r_{\mathrm{drag}} h$                 | $99.8^{+1.8}_{-1.9}$            | $H(0.51)$                   | $89.71^{+0.59}_{-0.57}$      |
| $\tau$                                      | $0.055^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$           | $2.422^{+0.056}_{-0.055}$       | $D_{\mathrm{M}}(0.51)$      | $1980^{+22}_{-22}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.041^{+0.037}_{-0.034}$       | $z_{\mathrm{re}}$                     | $7.7^{+1.7}_{-1.7}$             | $H(0.61)$                   | $95.31^{+0.51}_{-0.48}$      |
| $n_{\mathrm{s}}$                            | $0.9668^{+0.0094}_{-0.0089}$    | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.079}_{-0.071}$       | $D_{\mathrm{M}}(0.61)$      | $2305^{+24}_{-23}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.003^{+0.015}_{-0.015}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.8^{+1.6}_{-1.5}$        |
| $y_{\mathrm{cal}}$                          | $1.0004^{+0.0049}_{-0.0049}$    | $D_{40}$                              | $1217^{+39}_{-38}$              | $D_{\mathrm{M}}(2.33)$      | $5764^{+25}_{-26}$           |
| $A_{100}^{\mathrm{PS}}$                     | $243^{+50}_{-50}$               | $D_{220}$                             | $5710^{+81}_{-78}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$    |
| $A_{143}^{\mathrm{PS}}$                     | $41^{+20}_{-20}$                | $D_{810}$                             | $2534^{+28}_{-28}$              | $\sigma_8(0.15)$            | $0.746^{+0.014}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{1420}$                            | $814^{+11}_{-10}$               | $f\sigma_8(0.38)$           | $0.472^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.5^{+3.9}_{-3.8}$           | $\sigma_8(0.38)$            | $0.661^{+0.012}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.30$                        | $n_{\mathrm{s},0.002}$                | $0.975^{+0.047}_{-0.045}$       | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.64^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24534^{+0.00016}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.619^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24667^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.010}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.608^{+0.076}_{-0.076}$       | $\sigma_8(0.61)$            | $0.589^{+0.011}_{-0.010}$    |
| $A^{\mathrm{kSZ}}$                          | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.801^{+0.056}_{-0.059}$      | $f\sigma_8(2.33)$           | $0.2971^{+0.0054}_{-0.0051}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.02^{+0.39}_{-0.39}$          | $z_*$                                 | $1089.98^{+0.60}_{-0.60}$       | $\sigma_8(2.33)$            | $0.3063^{+0.0056}_{-0.0052}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.34}$          | $r_*$                                 | $144.80^{+0.64}_{-0.63}$        | $f_{2000}^{143}$            | $31^{+7}_{-7}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04126^{+0.00083}_{-0.00079}$ | $f_{2000}^{217}$            | $107.7^{+4.2}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.33}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.906^{+0.062}_{-0.062}$      | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.58^{+0.92}_{-0.95}$       | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 1.9)$           |
| $c_{217}$                                   | $1.0013^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.51^{+0.70}_{-0.70}$        | $\chi_{\mathrm{lowl}}^2$    | $22.6 (\nu: 1.6)$            |
| $H_0$                                       | $67.7^{+1.1}_{-1.1}$            | $k_{\mathrm{D}}$                      | $0.14034^{+0.00094}_{-0.00093}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.6 (\nu: 15.3)$         |
| $\Omega_{\Lambda}$                          | $0.690^{+0.014}_{-0.015}$       | $100\theta_{\mathrm{D}}$              | $0.16098^{+0.00054}_{-0.00053}$ | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                       | $0.310^{+0.015}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3374^{+57}_{-55}$              | $\chi_{\mathrm{MGS}}^2$     | $1.39 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1418^{+0.0024}_{-0.0023}$    | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09599^{+0.00095}_{-0.00095}$ | $100\theta_{\mathrm{eq}}$             | $0.818^{+0.010}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.2)$             |
| $\sigma_8$                                  | $0.807^{+0.016}_{-0.015}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4520^{+0.0052}_{-0.0054}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |
| $S_8$                                       | $0.820^{+0.030}_{-0.028}$       | $H(0.15)$                             | $72.94^{+0.94}_{-0.93}$         | $\chi_{\mathrm{CMB}}^2$     | $7484.3 (\nu: 15.1)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$        | $0.449^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$                | $640.7^{+9.2}_{-9.1}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7498.15; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.60; R - 1 = 0.01937$$



### 10.3 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$   | $0.02217^{+0.00044}_{-0.00044}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.457^{+0.018}_{-0.017}$       | $H(0.15)$                   | $72.4^{+1.2}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$   | $0.1202^{+0.0032}_{-0.0031}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $646^{+13}_{-12}$            |
| $100\theta_{\mathrm{MC}}$   | $1.04087^{+0.00089}_{-0.00089}$ | $\sigma_8/h^{0.5}$                    | $0.990^{+0.020}_{-0.021}$       | $H(0.38)$                   | $82.65^{+0.92}_{-0.89}$      |
| $\tau$  | $0.053^{+0.017}_{-0.016}$       | $r_{\mathrm{drag}} h$                 | $98.8^{+2.5}_{-2.5}$            | $D_{\mathrm{M}}(0.38)$      | $1539^{+25}_{-24}$           |
| $\ln(10^{10} A_{\mathrm{s}})$   | $3.041^{+0.033}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$           | $2.443^{+0.052}_{-0.052}$       | $H(0.51)$                   | $89.43^{+0.75}_{-0.71}$      |
| $n_{\mathrm{s}}$  | $0.964^{+0.011}_{-0.010}$       | $z_{\mathrm{re}}$                     | $7.6^{+1.6}_{-1.7}$             | $D_{\mathrm{M}}(0.51)$      | $1992^{+29}_{-29}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$   | $-0.002^{+0.014}_{-0.015}$      | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.070}_{-0.065}$       | $H(0.61)$                   | $95.10^{+0.62}_{-0.60}$      |
| $y_{\mathrm{cal}}$  | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.881^{+0.024}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2317^{+31}_{-31}$           |
| $A_{100}^{\mathrm{PS}}$   | $244^{+50}_{-50}$               | $D_{40}$                              | $1224^{+40}_{-39}$              | $H(2.33)$                   | $236.5^{+1.9}_{-1.9}$        |
| $A_{143}^{\mathrm{PS}}$   | $42^{+20}_{-20}$                | $D_{220}$                             | $5707^{+83}_{-78}$              | $D_{\mathrm{M}}(2.33)$      | $5773^{+30}_{-29}$           |
| $A_{217}^{\mathrm{PS}}$   | $100^{+30}_{-30}$               | $D_{810}$                             | $2534^{+28}_{-26}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$  | $41^{+10}_{-10}$                | $D_{1420}$                            | $814^{+11}_{-10}$               | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$  | $< 7.38$                        | $D_{2000}$                            | $229.2^{+4.0}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$  | $0.65^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.971^{+0.045}_{-0.045}$       | $\sigma_8(0.38)$            | $0.6626^{+0.0098}_{-0.0097}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$   | —                               | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$  | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24663^{+0.00019}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.6198^{+0.0095}_{-0.0090}$ |
| $A^{\mathrm{kSZ}}$  | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.624^{+0.086}_{-0.081}$       | $f\sigma_8(0.61)$           | $0.4703^{+0.0092}_{-0.0095}$ |
| $A_{100}^{\mathrm{dust}}$   | $1.01^{+0.37}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.820^{+0.067}_{-0.066}$      | $\sigma_8(0.61)$            | $0.5896^{+0.0091}_{-0.0087}$ |
| $A_{143}^{\mathrm{dust}}$   | $0.98^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.20^{+0.74}_{-0.71}$       | $f\sigma_8(2.33)$           | $0.2970^{+0.0048}_{-0.0047}$ |
| $A_{217}^{\mathrm{dust}}$   | $0.97^{+0.20}_{-0.21}$          | $r_*$                                 | $144.52^{+0.73}_{-0.73}$        | $\sigma_8(2.33)$            | $0.3060^{+0.0054}_{-0.0052}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$  | $1.03^{+0.33}_{-0.33}$          | $100\theta_*$                         | $1.04107^{+0.00088}_{-0.00087}$ | $f_{2000}^{143}$            | $31^{+6}_{-7}$               |
| $c_{100}$   | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.882^{+0.069}_{-0.070}$      | $f_{2000}^{217}$            | $107.9^{+4.2}_{-4.3}$        |
| $c_{217}$   | $1.0013^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.48^{+0.94}_{-0.96}$       | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $H_0$   | $67.1^{+1.4}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.25^{+0.77}_{-0.78}$        | $\chi_{\mathrm{lensing}}^2$ | $9.61 (\nu: 0.4)$            |
| $\Omega_{\Lambda}$  | $0.682^{+0.019}_{-0.020}$       | $k_{\mathrm{D}}$                      | $0.14054^{+0.00096}_{-0.00095}$ | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.5)$           |
| $\Omega_{\mathrm{m}}$   | $0.318^{+0.020}_{-0.019}$       | $100\theta_{\mathrm{D}}$              | $0.16103^{+0.00056}_{-0.00053}$ | $\chi_{\mathrm{lowl}}^2$    | $23.2 (\nu: 2.2)$            |
| $\Omega_{\mathrm{m}} h^2$   | $0.1431^{+0.0030}_{-0.0029}$    | $z_{\mathrm{eq}}$                     | $3403^{+72}_{-70}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7063.5 (\nu: 14.6)$         |
| $\Omega_{\mathrm{m}} h^3$   | $0.09597^{+0.00094}_{-0.00094}$ | $k_{\mathrm{eq}}$                     | $0.01039^{+0.00022}_{-0.00022}$ | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.0)$             |
| $\sigma_8$  | $0.811^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{eq}}$             | $0.813^{+0.014}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.4 (\nu: 15.9)$         |
| $S_8$   | $0.834^{+0.032}_{-0.032}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4492^{+0.0069}_{-0.0068}$    |                             |                              |
| $\bar{\chi}_{\mathrm{eff}}^2 = 7501.08; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.83; R - 1 = 0.01225$ |                                 |                                       |                                 |                             |                              |



#### 10.4 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02225^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.97^{+0.66}_{-0.65}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1191^{+0.0022}_{-0.0021}$    | $\sigma_8/h^{0.5}$                    | $0.984^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.38)$      | $1530^{+17}_{-17}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04104^{+0.00084}_{-0.00080}$ | $r_{\mathrm{drag}} h$                 | $99.7^{+1.7}_{-1.7}$            | $H(0.51)$                   | $89.67^{+0.57}_{-0.54}$      |
| $\tau$                                      | $0.056^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$           | $2.430^{+0.046}_{-0.046}$       | $D_{\mathrm{M}}(0.51)$      | $1982^{+20}_{-20}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.045^{+0.033}_{-0.030}$       | $z_{\mathrm{re}}$                     | $7.9^{+1.5}_{-1.5}$             | $H(0.61)$                   | $95.28^{+0.50}_{-0.47}$      |
| $n_{\mathrm{s}}$                            | $0.9663^{+0.0091}_{-0.0085}$    | $10^9 A_{\mathrm{s}}$                 | $2.101^{+0.069}_{-0.063}$       | $D_{\mathrm{M}}(0.61)$      | $2306^{+22}_{-22}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.002^{+0.015}_{-0.015}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.023}_{-0.022}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.4}$        |
| $y_{\mathrm{cal}}$                          | $1.0006^{+0.0049}_{-0.0048}$    | $D_{40}$                              | $1220^{+38}_{-38}$              | $D_{\mathrm{M}}(2.33)$      | $5765^{+24}_{-25}$           |
| $A_{100}^{\mathrm{PS}}$                     | $243^{+50}_{-50}$               | $D_{220}$                             | $5714^{+79}_{-77}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                     | $41^{+20}_{-20}$                | $D_{810}$                             | $2535^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.012}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                     | $101^{+30}_{-30}$               | $D_{1420}$                            | $815^{+11}_{-10}$               | $f\sigma_8(0.38)$           | $0.474^{+0.010}_{-0.010}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.7^{+3.9}_{-3.7}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0096}$   |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.31$                        | $n_{\mathrm{s},0.002}$                | $0.974^{+0.047}_{-0.046}$       | $f\sigma_8(0.51)$           | $0.4729^{+0.0090}_{-0.0090}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.65^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}$                      | $0.24534^{+0.00016}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.6204^{+0.0096}_{-0.0090}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24667^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.4679^{+0.0083}_{-0.0083}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.610^{+0.076}_{-0.074}$       | $\sigma_8(0.61)$            | $0.5903^{+0.0091}_{-0.0085}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.803^{+0.056}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.2977^{+0.0048}_{-0.0044}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.38}_{-0.39}$          | $z_*$                                 | $1090.00^{+0.59}_{-0.58}$       | $\sigma_8(2.33)$            | $0.3069^{+0.0052}_{-0.0046}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.34}$          | $r_*$                                 | $144.75^{+0.57}_{-0.57}$        | $f_{2000}^{143}$            | $31^{+6}_{-7}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$                         | $1.04123^{+0.00083}_{-0.00079}$ | $f_{2000}^{217}$            | $107.6^{+4.2}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.33}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.902^{+0.056}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-5}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.58^{+0.92}_{-0.95}$       | $\chi_{\mathrm{lensing}}^2$ | $9.47 (\nu: 0.3)$            |
| $c_{217}$                                   | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.46^{+0.65}_{-0.64}$        | $\chi_{\mathrm{simall}}^2$  | $397.3 (\nu: 1.9)$           |
| $H_0$                                       | $67.60^{+0.99}_{-0.99}$         | $k_{\mathrm{D}}$                      | $0.14038^{+0.00089}_{-0.00088}$ | $\chi_{\mathrm{lowl}}^2$    | $22.8 (\nu: 1.8)$            |
| $\Omega_{\Lambda}$                          | $0.689^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{D}}$              | $0.16098^{+0.00054}_{-0.00052}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.8 (\nu: 14.3)$         |
| $\Omega_{\mathrm{m}}$                       | $0.311^{+0.013}_{-0.013}$       | $z_{\mathrm{eq}}$                     | $3378^{+50}_{-50}$              | $\chi_{6\mathrm{DF}}^2$     | $0.057 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1420^{+0.0021}_{-0.0021}$    | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{MGS}}^2$     | $1.30 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09600^{+0.00093}_{-0.00094}$ | $100\theta_{\mathrm{eq}}$             | $0.8174^{+0.0092}_{-0.0092}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.2)$             |
| $\sigma_8$                                  | $0.809^{+0.013}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4516^{+0.0048}_{-0.0048}$    | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.1)$             |
| $S_8$                                       | $0.824^{+0.024}_{-0.024}$       | $H(0.15)$                             | $72.87^{+0.85}_{-0.85}$         | $\chi_{\mathrm{CMB}}^2$     | $7493.4 (\nu: 15.3)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$        | $0.451^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$                | $641.4^{+8.5}_{-8.3}$           | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7507.23; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.75; R - 1 = 0.02103$$



# 10.5 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02217^{+0.00045}_{-0.00046}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.459^{+0.026}_{-0.025}$       | $H(0.15)$                   | $72.4^{+1.6}_{-1.5}$         |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1205^{+0.0042}_{-0.0040}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.611^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.15)$      | $646^{+16}_{-15}$            |
| $100\theta_{\mathrm{MC}}$                   | $1.04086^{+0.00094}_{-0.00093}$ | $\sigma_8/h^{0.5}$                    | $0.992^{+0.031}_{-0.031}$       | $H(0.38)$                   | $82.6^{+1.1}_{-1.1}$         |
| $\tau$                                      | $0.055^{+0.014}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $98.6^{+3.1}_{-3.2}$            | $D_{\mathrm{M}}(0.38)$      | $1540^{+31}_{-31}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.045^{+0.032}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$           | $2.447^{+0.075}_{-0.073}$       | $H(0.51)$                   | $89.41^{+0.89}_{-0.86}$      |
| $n_{\mathrm{s}}$                            | $0.963^{+0.012}_{-0.012}$       | $z_{\mathrm{re}}$                     | $< 9.03$                        | $D_{\mathrm{M}}(0.51)$      | $1994^{+36}_{-36}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.004^{+0.015}_{-0.015}$      | $10^9 A_{\mathrm{s}}$                 | $2.100^{+0.067}_{-0.060}$       | $H(0.61)$                   | $95.08^{+0.72}_{-0.68}$      |
| $y_{\mathrm{cal}}$                          | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.883^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(0.61)$      | $2319^{+39}_{-39}$           |
| $A_{100}^{\mathrm{PS}}$                     | $244^{+50}_{-50}$               | $D_{40}$                              | $1222^{+42}_{-41}$              | $H(2.33)$                   | $236.7^{+2.6}_{-2.5}$        |
| $A_{143}^{\mathrm{PS}}$                     | $42^{+20}_{-20}$                | $D_{220}$                             | $5704^{+82}_{-80}$              | $D_{\mathrm{M}}(2.33)$      | $5774^{+32}_{-33}$           |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{810}$                             | $2535^{+29}_{-27}$              | $f\sigma_8(0.15)$           | $0.463^{+0.024}_{-0.023}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $42^{+20}_{-10}$                | $D_{1420}$                            | $814^{+11}_{-10}$               | $\sigma_8(0.15)$            | $0.750^{+0.014}_{-0.014}$    |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.31$                        | $D_{2000}$                            | $229.2^{+4.0}_{-3.9}$           | $f\sigma_8(0.38)$           | $0.480^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.64^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.975^{+0.047}_{-0.045}$       | $\sigma_8(0.38)$            | $0.664^{+0.012}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00019}_{-0.00021}$ | $f\sigma_8(0.51)$           | $0.477^{+0.016}_{-0.016}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00019}_{-0.00021}$ | $\sigma_8(0.51)$            | $0.621^{+0.010}_{-0.0096}$   |
| $A^{\mathrm{kSZ}}$                          | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.624^{+0.090}_{-0.084}$       | $f\sigma_8(0.61)$           | $0.472^{+0.014}_{-0.014}$    |
| $A_{100}^{\mathrm{dust}}$                   | $1.02^{+0.38}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.821^{+0.074}_{-0.073}$      | $\sigma_8(0.61)$            | $0.5906^{+0.0094}_{-0.0089}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.35}$          | $z_{*}$                               | $1090.22^{+0.83}_{-0.80}$       | $f\sigma_8(2.33)$           | $0.2975^{+0.0046}_{-0.0042}$ |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.20}$          | $r_{*}$                               | $144.46^{+0.94}_{-0.98}$        | $\sigma_8(2.33)$            | $0.3064^{+0.0049}_{-0.0043}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.32}$          | $100\theta_{*}$                       | $1.04106^{+0.00092}_{-0.00092}$ | $f_{2000}^{143}$            | $31^{+7}_{-7}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.876^{+0.087}_{-0.090}$      | $f_{2000}^{217}$            | $108.0^{+4.3}_{-4.4}$        |
| $c_{217}$                                   | $1.0013^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.51^{+0.96}_{-0.99}$       | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-5}$               |
| $H_0$                                       | $67.0^{+1.8}_{-1.8}$            | $r_{\mathrm{drag}}$                   | $147.19^{+0.96}_{-0.99}$        | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.6)$           |
| $\Omega_{\Lambda}$                          | $0.681^{+0.024}_{-0.026}$       | $k_{\mathrm{D}}$                      | $0.1406^{+0.0011}_{-0.0011}$    | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 2.1)$            |
| $\Omega_{\mathrm{m}}$                       | $0.319^{+0.026}_{-0.024}$       | $100\theta_{\mathrm{D}}$              | $0.16101^{+0.00057}_{-0.00055}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.2 (\nu: 16.0)$         |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1433^{+0.0040}_{-0.0038}$    | $z_{\mathrm{eq}}$                     | $3409^{+96}_{-91}$              | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.1)$             |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09601^{+0.00097}_{-0.00095}$ | $k_{\mathrm{eq}}$                     | $0.01040^{+0.00029}_{-0.00028}$ | $\chi_{\mathrm{CMB}}^2$     | $7484.1 (\nu: 15.5)$         |
| $\sigma_8$                                  | $0.812^{+0.017}_{-0.017}$       | $100\theta_{\mathrm{eq}}$             | $0.812^{+0.017}_{-0.017}$       |                             |                              |
| $S_8$                                       | $0.838^{+0.048}_{-0.046}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4487^{+0.0089}_{-0.0091}$    |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7491.87$ ;  $\Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.61$ ;  $R - 1 = 0.00915$



## 10.6 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02226^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.016}_{-0.015}$       | $H(0.38)$                   | $83.02^{+0.71}_{-0.68}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1189^{+0.0024}_{-0.0023}$    | $\sigma_8/h^{0.5}$                    | $0.982^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+19}_{-19}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04107^{+0.00085}_{-0.00080}$ | $r_{\mathrm{drag}} h$                 | $99.9^{+1.8}_{-1.8}$            | $H(0.51)$                   | $89.72^{+0.59}_{-0.56}$      |
| $\tau$                                      | $0.056^{+0.015}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.424^{+0.055}_{-0.053}$       | $D_{\mathrm{M}}(0.51)$      | $1980^{+22}_{-22}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.043^{+0.033}_{-0.029}$       | $z_{\mathrm{re}}$                     | $< 9.12$                        | $H(0.61)$                   | $95.32^{+0.51}_{-0.48}$      |
| $n_{\mathrm{s}}$                            | $0.9669^{+0.0094}_{-0.0089}$    | $10^9 A_{\mathrm{s}}$                 | $2.098^{+0.069}_{-0.062}$       | $D_{\mathrm{M}}(0.61)$      | $2304^{+24}_{-23}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.003^{+0.014}_{-0.015}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.7^{+1.6}_{-1.5}$        |
| $y_{\mathrm{cal}}$                          | $1.0004^{+0.0049}_{-0.0048}$    | $D_{40}$                              | $1216^{+39}_{-38}$              | $D_{\mathrm{M}}(2.33)$      | $5764^{+25}_{-25}$           |
| $A_{100}^{\mathrm{PS}}$                     | $243^{+50}_{-50}$               | $D_{220}$                             | $5710^{+80}_{-78}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.014}$    |
| $A_{143}^{\mathrm{PS}}$                     | $41^{+20}_{-20}$                | $D_{810}$                             | $2533^{+29}_{-28}$              | $\sigma_8(0.15)$            | $0.747^{+0.013}_{-0.012}$    |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{1420}$                            | $814^{+11}_{-10}$               | $f\sigma_8(0.38)$           | $0.473^{+0.013}_{-0.012}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.5^{+3.9}_{-3.7}$           | $\sigma_8(0.38)$            | $0.662^{+0.011}_{-0.010}$    |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.31$                        | $n_{\mathrm{s},0.002}$                | $0.976^{+0.046}_{-0.044}$       | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.64^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24535^{+0.00016}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.620^{+0.010}_{-0.0094}$   |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24667^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.467^{+0.011}_{-0.0098}$   |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.607^{+0.077}_{-0.076}$       | $\sigma_8(0.61)$            | $0.5897^{+0.0097}_{-0.0088}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.800^{+0.057}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.2974^{+0.0048}_{-0.0043}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.02^{+0.39}_{-0.39}$          | $z_{*}$                               | $1089.97^{+0.60}_{-0.60}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0050}_{-0.0045}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.35}_{-0.34}$          | $r_{*}$                               | $144.80^{+0.64}_{-0.63}$        | $f_{2000}^{143}$            | $31^{+7}_{-7}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.19}_{-0.20}$          | $100\theta_{*}$                       | $1.04126^{+0.00083}_{-0.00079}$ | $f_{2000}^{217}$            | $107.7^{+4.2}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.33}_{-0.32}$          | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.906^{+0.062}_{-0.062}$      | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.59^{+0.95}_{-0.92}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.9)$           |
| $c_{217}$                                   | $1.0013^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.51^{+0.70}_{-0.70}$        | $\chi_{\mathrm{lowl}}^2$    | $22.5 (\nu: 1.6)$            |
| $H_0$                                       | $67.7^{+1.1}_{-1.1}$            | $k_{\mathrm{D}}$                      | $0.14034^{+0.00094}_{-0.00093}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7064.5 (\nu: 15.2)$         |
| $\Omega_{\Lambda}$                          | $0.690^{+0.014}_{-0.015}$       | $100\theta_{\mathrm{D}}$              | $0.16097^{+0.00054}_{-0.00053}$ | $\chi_{6\mathrm{DF}}^2$     | $0.053 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                       | $0.310^{+0.015}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3374^{+57}_{-56}$              | $\chi_{\mathrm{MGS}}^2$     | $1.40 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1418^{+0.0024}_{-0.0023}$    | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09600^{+0.00096}_{-0.00095}$ | $100\theta_{\mathrm{eq}}$             | $0.818^{+0.010}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.2)$             |
| $\sigma_8$                                  | $0.808^{+0.015}_{-0.014}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4521^{+0.0052}_{-0.0054}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |
| $S_8$                                       | $0.821^{+0.030}_{-0.028}$       | $H(0.15)$                             | $72.95^{+0.93}_{-0.92}$         | $\chi_{\mathrm{CMB}}^2$     | $7484.1 (\nu: 14.8)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$        | $0.449^{+0.016}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$                | $640.6^{+9.2}_{-9.2}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7497.95; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.64; R - 1 = 0.02138$$



## 10.7 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02218^{+0.00043}_{-0.00043}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.457^{+0.018}_{-0.017}$       | $H(0.15)$                   | $72.5^{+1.2}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1201^{+0.0030}_{-0.0030}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $645^{+12}_{-12}$            |
| $100\theta_{\mathrm{MC}}$                   | $1.04088^{+0.00089}_{-0.00087}$ | $\sigma_8/h^{0.5}$                    | $0.990^{+0.020}_{-0.021}$       | $H(0.38)$                   | $82.69^{+0.90}_{-0.86}$      |
| $\tau$                                      | $0.055^{+0.014}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $98.9^{+2.4}_{-2.3}$            | $D_{\mathrm{M}}(0.38)$      | $1537^{+24}_{-24}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.044^{+0.029}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$           | $2.443^{+0.052}_{-0.052}$       | $H(0.51)$                   | $89.46^{+0.73}_{-0.70}$      |
| $n_{\mathrm{s}}$                            | $0.964^{+0.010}_{-0.0098}$      | $z_{\mathrm{re}}$                     | $< 8.99$                        | $D_{\mathrm{M}}(0.51)$      | $1991^{+28}_{-28}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.003^{+0.014}_{-0.015}$      | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.060}_{-0.054}$       | $H(0.61)$                   | $95.12^{+0.61}_{-0.58}$      |
| $y_{\mathrm{cal}}$                          | $1.0004^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.881^{+0.024}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2316^{+30}_{-30}$           |
| $A_{100}^{\mathrm{PS}}$                     | $244^{+50}_{-50}$               | $D_{40}$                              | $1223^{+39}_{-39}$              | $H(2.33)$                   | $236.4^{+1.9}_{-1.8}$        |
| $A_{143}^{\mathrm{PS}}$                     | $42^{+20}_{-20}$                | $D_{220}$                             | $5707^{+83}_{-79}$              | $D_{\mathrm{M}}(2.33)$      | $5772^{+28}_{-29}$           |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{810}$                             | $2534^{+28}_{-26}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $41^{+10}_{-10}$                | $D_{1420}$                            | $814^{+11}_{-10}$               | $\sigma_8(0.15)$            | $0.749^{+0.011}_{-0.010}$    |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.38$                        | $D_{2000}$                            | $229.3^{+4.0}_{-3.8}$           | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.65^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.972^{+0.045}_{-0.045}$       | $\sigma_8(0.38)$            | $0.6634^{+0.0090}_{-0.0086}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00018}_{-0.00019}$ | $f\sigma_8(0.51)$           | $0.476^{+0.010}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00018}_{-0.00019}$ | $\sigma_8(0.51)$            | $0.6206^{+0.0085}_{-0.0080}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.622^{+0.083}_{-0.080}$       | $f\sigma_8(0.61)$           | $0.4705^{+0.0092}_{-0.0093}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.37}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.818^{+0.065}_{-0.065}$      | $\sigma_8(0.61)$            | $0.5903^{+0.0081}_{-0.0076}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.17^{+0.71}_{-0.70}$       | $f\sigma_8(2.33)$           | $0.2974^{+0.0043}_{-0.0039}$ |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.21}$          | $r_*$                                 | $144.55^{+0.71}_{-0.72}$        | $\sigma_8(2.33)$            | $0.3064^{+0.0048}_{-0.0042}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04109^{+0.00088}_{-0.00086}$ | $f_{2000}^{143}$            | $31^{+6}_{-7}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.884^{+0.067}_{-0.068}$      | $f_{2000}^{217}$            | $107.9^{+4.2}_{-4.3}$        |
| $c_{217}$                                   | $1.0013^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.50^{+0.92}_{-0.95}$       | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $H_0$                                       | $67.2^{+1.4}_{-1.4}$            | $r_{\mathrm{drag}}$                   | $147.28^{+0.76}_{-0.77}$        | $\chi_{\mathrm{lensing}}^2$ | $9.59 (\nu: 0.4)$            |
| $\Omega_{\Lambda}$                          | $0.683^{+0.019}_{-0.019}$       | $k_{\mathrm{D}}$                      | $0.14053^{+0.00095}_{-0.00094}$ | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.5)$           |
| $\Omega_{\mathrm{m}}$                       | $0.317^{+0.019}_{-0.019}$       | $100\theta_{\mathrm{D}}$              | $0.16102^{+0.00056}_{-0.00053}$ | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 2.1)$            |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1429^{+0.0029}_{-0.0029}$    | $z_{\mathrm{eq}}$                     | $3400^{+69}_{-69}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7063.5 (\nu: 14.7)$         |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09598^{+0.00093}_{-0.00093}$ | $k_{\mathrm{eq}}$                     | $0.01038^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.0)$             |
| $\sigma_8$                                  | $0.811^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.813^{+0.013}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.1 (\nu: 15.5)$         |
| $S_8$                                       | $0.834^{+0.032}_{-0.032}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4495^{+0.0067}_{-0.0065}$    |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7500.82$ ;  $\Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.81$ ;  $R - 1 = 0.01490$



# 10.8 base\_nrun\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02225^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.98^{+0.65}_{-0.64}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1191^{+0.0021}_{-0.0021}$    | $\sigma_8/h^{0.5}$                    | $0.984^{+0.018}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1530^{+17}_{-17}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04104^{+0.00084}_{-0.00080}$ | $r_{\mathrm{drag}} h$                 | $99.7^{+1.7}_{-1.6}$            | $H(0.51)$                   | $89.68^{+0.56}_{-0.53}$      |
| $\tau$                                      | $0.057^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.431^{+0.045}_{-0.045}$       | $D_{\mathrm{M}}(0.51)$      | $1982^{+20}_{-20}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.046^{+0.030}_{-0.028}$       | $z_{\mathrm{re}}$                     | $7.9^{+1.3}_{-1.4}$             | $H(0.61)$                   | $95.29^{+0.50}_{-0.47}$      |
| $n_{\mathrm{s}}$                            | $0.9664^{+0.0091}_{-0.0085}$    | $10^9 A_{\mathrm{s}}$                 | $2.104^{+0.063}_{-0.058}$       | $D_{\mathrm{M}}(0.61)$      | $2306^{+22}_{-22}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.002^{+0.015}_{-0.015}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.023}_{-0.022}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.4}$        |
| $y_{\mathrm{cal}}$                          | $1.0006^{+0.0049}_{-0.0047}$    | $D_{40}$                              | $1220^{+38}_{-38}$              | $D_{\mathrm{M}}(2.33)$      | $5765^{+24}_{-25}$           |
| $A_{100}^{\mathrm{PS}}$                     | $243^{+50}_{-50}$               | $D_{220}$                             | $5714^{+79}_{-77}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                     | $41^{+20}_{-20}$                | $D_{810}$                             | $2535^{+28}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.011}_{-0.010}$    |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{1420}$                            | $815^{+11}_{-10}$               | $f\sigma_8(0.38)$           | $0.4743^{+0.0099}_{-0.0099}$ |
| $A_{217}^{\mathrm{CIB}}$                    | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.7^{+3.9}_{-3.7}$           | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0087}$   |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.32$                        | $n_{\mathrm{s},0.002}$                | $0.974^{+0.047}_{-0.046}$       | $f\sigma_8(0.51)$           | $0.4730^{+0.0088}_{-0.0088}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.65^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}$                      | $0.24534^{+0.00016}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.6207^{+0.0089}_{-0.0084}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24667^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.4681^{+0.0082}_{-0.0080}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.609^{+0.076}_{-0.074}$       | $\sigma_8(0.61)$            | $0.5906^{+0.0085}_{-0.0080}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.802^{+0.056}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.2978^{+0.0044}_{-0.0041}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.02^{+0.38}_{-0.39}$          | $z_*$                                 | $1090.00^{+0.59}_{-0.58}$       | $\sigma_8(2.33)$            | $0.3071^{+0.0047}_{-0.0043}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.34}$          | $r_*$                                 | $144.76^{+0.57}_{-0.57}$        | $f_{2000}^{143}$            | $31^{+6}_{-7}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$                         | $1.04124^{+0.00083}_{-0.00079}$ | $f_{2000}^{217}$            | $107.7^{+4.1}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.33}_{-0.33}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.902^{+0.056}_{-0.056}$      | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.59^{+0.92}_{-0.91}$       | $\chi_{\mathrm{lensing}}^2$ | $9.43 (\nu: 0.3)$            |
| $c_{217}$                                   | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.47^{+0.65}_{-0.64}$        | $\chi_{\mathrm{simall}}^2$  | $397.3 (\nu: 2.0)$           |
| $H_0$                                       | $67.61^{+0.99}_{-0.97}$         | $k_{\mathrm{D}}$                      | $0.14038^{+0.00089}_{-0.00088}$ | $\chi_{\mathrm{lowl}}^2$    | $22.8 (\nu: 1.8)$            |
| $\Omega_{\Lambda}$                          | $0.689^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{D}}$              | $0.16098^{+0.00054}_{-0.00052}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.8 (\nu: 14.4)$         |
| $\Omega_{\mathrm{m}}$                       | $0.311^{+0.013}_{-0.013}$       | $z_{\mathrm{eq}}$                     | $3378^{+50}_{-50}$              | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1420^{+0.0021}_{-0.0021}$    | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{MGS}}^2$     | $1.31 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09600^{+0.00094}_{-0.00094}$ | $100\theta_{\mathrm{eq}}$             | $0.8175^{+0.0092}_{-0.0091}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.1)$             |
| $\sigma_8$                                  | $0.809^{+0.012}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4517^{+0.0048}_{-0.0047}$    | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.1)$             |
| $S_8$                                       | $0.824^{+0.024}_{-0.024}$       | $H(0.15)$                             | $72.88^{+0.85}_{-0.85}$         | $\chi_{\mathrm{CMB}}^2$     | $7493.3 (\nu: 15.1)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$        | $0.451^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$                | $641.3^{+8.4}_{-8.3}$           | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.7)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7507.10; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.78; R - 1 = 0.02288$$



# 10.9 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                           | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-------------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022296 | $0.02229^{+0.00032}_{-0.00031}$ | $\sigma_8$                          | 0.8086   | $0.808^{+0.015}_{-0.015}$       | $100\theta_{\text{eq}}$     | 0.8148   | $0.815^{+0.012}_{-0.012}$    |
| $\Omega_c h^2$                       | 0.11967  | $0.1196^{+0.0028}_{-0.0027}$    | $S_8$                               | 0.8272   | $0.826^{+0.032}_{-0.032}$       | $100\theta_{\text{s,eq}}$   | 0.4502   | $0.4503^{+0.0060}_{-0.0061}$ |
| $100\theta_{\text{MC}}$              | 1.04087  | $1.04087^{+0.00063}_{-0.00060}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | 0.4531   | $0.453^{+0.018}_{-0.017}$       | $H(0.15)$                   | 72.70    | $72.7^{+1.0}_{-1.0}$         |
| $\tau$                               | 0.0532   | $0.053^{+0.017}_{-0.016}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | 0.6053   | $0.605^{+0.017}_{-0.017}$       | $D_{\text{M}}(0.15)$        | 643.1    | $643^{+10}_{-10}$            |
| $\ln(10^{10} A_{\text{s}})$          | 3.0394   | $3.039^{+0.035}_{-0.034}$       | $\sigma_8/h^{0.5}$                  | 0.9849   | $0.984^{+0.024}_{-0.023}$       | $H(0.38)$                   | 82.86    | $82.86^{+0.75}_{-0.74}$      |
| $n_{\text{s}}$                       | 0.9660   | $0.9657^{+0.0094}_{-0.0096}$    | $r_{\text{drag}} h$                 | 99.25    | $99.3^{+2.1}_{-2.1}$            | $D_{\text{M}}(0.38)$        | 1533.1   | $1533^{+21}_{-20}$           |
| $dn_{\text{s}}/d \ln k$              | -0.0007  | $-0.001^{+0.013}_{-0.013}$      | $\langle d^2 \rangle^{1/2}$         | 2.433    | $2.432^{+0.056}_{-0.057}$       | $H(0.51)$                   | 89.60    | $89.60^{+0.59}_{-0.57}$      |
| $y_{\text{cal}}$                     | 1.00030  | $1.0004^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                     | 7.57     | $7.5^{+1.6}_{-1.7}$             | $D_{\text{M}}(0.51)$        | 1985.6   | $1985^{+24}_{-24}$           |
| $A_{100}^{\text{PS}}$                | 236.5    | $241^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | 2.089    | $2.088^{+0.075}_{-0.070}$       | $H(0.61)$                   | 95.236   | $95.24^{+0.48}_{-0.46}$      |
| $A_{143}^{\text{PS}}$                | 42.4     | $40^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | 1.8786   | $1.879^{+0.025}_{-0.024}$       | $D_{\text{M}}(0.61)$        | 2310.2   | $2310^{+26}_{-26}$           |
| $A_{217}^{\text{PS}}$                | 102.5    | $102^{+30}_{-30}$               | $D_{40}$                            | 1223.7   | $1224^{+36}_{-35}$              | $H(2.33)$                   | 236.26   | $236.2^{+1.7}_{-1.6}$        |
| $A_{217}^{\text{CIB}}$               | 42.9     | $40^{+10}_{-10}$                | $D_{220}$                           | 5715     | $5716^{+77}_{-74}$              | $D_{\text{M}}(2.33)$        | 5766.6   | $5767^{+21}_{-22}$           |
| $A_{143}^{\text{tSZ}}$               | 5.59     | < 7.50                          | $D_{810}$                           | 2534.9   | $2535^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4574   | $0.457^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.627    | $0.65^{+0.25}_{-0.26}$          | $D_{1420}$                          | 815.6    | $815.3^{+9.9}_{-9.8}$           | $\sigma_8(0.15)$            | 0.7469   | $0.746^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.78     | —                               | $D_{2000}$                          | 230.18   | $230.0^{+3.7}_{-3.6}$           | $f\sigma_8(0.38)$           | 0.4752   | $0.475^{+0.014}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.33     | —                               | $n_{\text{s},0.002}$                | 0.9681   | $0.969^{+0.040}_{-0.040}$       | $\sigma_8(0.38)$            | 0.6618   | $0.661^{+0.011}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | 1.5      | —                               | $Y_{\text{P}}$                      | 0.245366 | $0.24536^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | 0.4735   | $0.473^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{dust}}$              | 1.015    | $1.01^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$         | 0.246692 | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.6192   | $0.619^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{dust}}$              | 0.978    | $0.97^{+0.35}_{-0.36}$          | $10^5 D/\text{H}$                   | 2.599    | $2.601^{+0.060}_{-0.058}$       | $f\sigma_8(0.61)$           | 0.4683   | $0.468^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{dust}}$              | 0.971    | $0.97^{+0.20}_{-0.20}$          | Age/Gyr                             | 13.8048  | $13.805^{+0.048}_{-0.050}$      | $\sigma_8(0.61)$            | 0.5891   | $0.589^{+0.010}_{-0.0098}$   |
| $A_{143 \times 217}^{\text{dust}}$   | 0.992    | $1.03^{+0.32}_{-0.31}$          | $z_*$                               | 1089.99  | $1089.99^{+0.56}_{-0.55}$       | $f\sigma_8(2.33)$           | 0.2970   | $0.2968^{+0.0051}_{-0.0049}$ |
| $c_{100}$                            | 0.99763  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                               | 144.57   | $144.59^{+0.63}_{-0.65}$        | $\sigma_8(2.33)$            | 0.3060   | $0.3059^{+0.0053}_{-0.0052}$ |
| $c_{217}$                            | 1.00129  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$                       | 1.04107  | $1.04106^{+0.00061}_{-0.00060}$ | $f_{2000}^{143}$            | 30.2     | $30^{+6}_{-6}$               |
| $c_{\text{TE}}$                      | 0.9966   | $0.9967^{+0.0098}_{-0.0098}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | 13.887   | $13.889^{+0.059}_{-0.060}$      | $f_{2000}^{217}$            | 106.90   | $107.1^{+4.3}_{-4.3}$        |
| $c_{\text{EE}}$                      | 0.9921   | $0.9922^{+0.0099}_{-0.0097}$    | $z_{\text{drag}}$                   | 1059.74  | $1059.73^{+0.66}_{-0.67}$       | $f_{2000}^{143 \times 217}$ | 32.19    | $32^{+5}_{-4}$               |
| $H_0$                                | 67.40    | $67.4^{+1.2}_{-1.2}$            | $r_{\text{drag}}$                   | 147.26   | $147.28^{+0.64}_{-0.66}$        | $\chi_{\text{small}}^2$     | 395.88   | $396.9 (\nu: 1.5)$           |
| $\Omega_{\Lambda}$                   | 0.6860   | $0.686^{+0.016}_{-0.017}$       | $k_{\text{D}}$                      | 0.14063  | $0.14061^{+0.00074}_{-0.00073}$ | $\chi_{\text{lowl}}^2$      | 22.85    | $23.1 (\nu: 1.7)$            |
| $\Omega_{\text{m}}$                  | 0.3140   | $0.314^{+0.017}_{-0.016}$       | $100\theta_{\text{D}}$              | 0.160863 | $0.16087^{+0.00039}_{-0.00039}$ | $\chi_{\text{CamSpec}}^2$   | 11499.9  | $11515.5 (\nu: 17.5)$        |
| $\Omega_{\text{m}} h^2$              | 0.14261  | $0.1426^{+0.0027}_{-0.0026}$    | $z_{\text{eq}}$                     | 3392     | $3391^{+64}_{-61}$              | $\chi_{\text{prior}}^2$     | 2.2      | $7.8 (\nu: 6.0)$             |
| $\Omega_{\text{m}} h^3$              | 0.09611  | $0.09609^{+0.00065}_{-0.00065}$ | $k_{\text{eq}}$                     | 0.010354 | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{\text{CMB}}^2$       | 11918.6  | $11935.6 (\nu: 17.6)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11920.76$ ;  $\Delta\chi_{\text{eff}}^2 = -0.00$ ;  $\bar{\chi}_{\text{eff}}^2 = 11943.38$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.92$ ;  $R - 1 = 0.00835$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.88 ( $\Delta$  -0.02) commander\_dx12\_v3\_2\_29: 22.85 ( $\Delta$  -0.15) CamSpec like\_10.7HM\_1400\_unified: 11499.86 ( $\Delta$  0.21)



# 10.10 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02233^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.04^{+0.58}_{-0.56}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1189^{+0.0020}_{-0.0020}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.601^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+15}_{-15}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04095^{+0.00059}_{-0.00057}$ | $\sigma_8/h^{0.5}$                    | $0.980^{+0.020}_{-0.021}$       | $H(0.51)$                   | $89.74^{+0.47}_{-0.45}$      |
| $\tau$                                      | $0.054^{+0.016}_{-0.016}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.6}_{-1.5}$            | $D_{\mathrm{M}}(0.51)$      | $1980^{+18}_{-18}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.039^{+0.035}_{-0.034}$       | $\langle d^2 \rangle^{1/2}$           | $2.423^{+0.049}_{-0.051}$       | $H(0.61)$                   | $95.34^{+0.39}_{-0.38}$      |
| $n_{\mathrm{s}}$                            | $0.9674^{+0.0083}_{-0.0080}$    | $z_{\mathrm{re}}$                     | $7.6^{+1.6}_{-1.7}$             | $D_{\mathrm{M}}(0.61)$      | $2304^{+19}_{-19}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $0.000^{+0.013}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.088^{+0.075}_{-0.069}$       | $H(2.33)$                   | $235.8^{+1.2}_{-1.3}$        |
| $y_{\mathrm{cal}}$                          | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+18}_{-19}$           |
| $A_{100}^{\mathrm{PS}}$                     | $240^{+50}_{-50}$               | $D_{40}$                              | $1222^{+35}_{-34}$              | $f\sigma_8(0.15)$           | $0.453^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                     | $39^{+20}_{-20}$                | $D_{220}$                             | $5720^{+78}_{-73}$              | $\sigma_8(0.15)$            | $0.745^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                     | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $40^{+20}_{-10}$                | $D_{1420}$                            | $815.9^{+9.6}_{-9.6}$           | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.50$                        | $D_{2000}$                            | $230.3^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.471^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.969^{+0.041}_{-0.040}$       | $\sigma_8(0.51)$            | $0.618^{+0.011}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4660^{+0.0096}_{-0.0097}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.589^{+0.010}_{-0.0097}$   |
| $A^{\mathrm{kSZ}}$                          | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.593^{+0.057}_{-0.055}$       | $f\sigma_8(2.33)$           | $0.2968^{+0.0051}_{-0.0049}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.796^{+0.042}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3061^{+0.0052}_{-0.0051}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.96^{+0.35}_{-0.35}$          | $z_{*}$                               | $1089.88^{+0.47}_{-0.46}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.21}_{-0.20}$          | $r_{*}$                               | $144.73^{+0.50}_{-0.49}$        | $f_{2000}^{217}$            | $106.9^{+4.1}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.31}_{-0.31}$          | $100\theta_{*}$                       | $1.04114^{+0.00058}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.901^{+0.048}_{-0.046}$      | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.5)$           |
| $c_{217}$                                   | $1.0011^{+0.0031}_{-0.0032}$    | $z_{\mathrm{drag}}$                   | $1059.77^{+0.65}_{-0.68}$       | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 1.6)$            |
| $c_{TE}$                                    | $0.9969^{+0.0097}_{-0.0099}$    | $r_{\mathrm{drag}}$                   | $147.41^{+0.54}_{-0.52}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11515.4 (\nu: 17.7)$        |
| $c_{EE}$                                    | $0.9925^{+0.0098}_{-0.0097}$    | $k_{\mathrm{D}}$                      | $0.14050^{+0.00066}_{-0.00068}$ | $\chi_{6\mathrm{DF}}^2$     | $0.045 (\nu: 0.0)$           |
| $H_0$                                       | $67.71^{+0.89}_{-0.87}$         | $100\theta_{\mathrm{D}}$              | $0.16085^{+0.00040}_{-0.00038}$ | $\chi_{\mathrm{MGS}}^2$     | $1.36 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                          | $0.690^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3376^{+45}_{-46}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}}$                       | $0.310^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1419^{+0.0019}_{-0.0019}$    | $100\theta_{\mathrm{eq}}$             | $0.8179^{+0.0087}_{-0.0084}$    | $\chi_{\mathrm{BAO}}^2$     | $5.97 (\nu: 0.5)$            |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09609^{+0.00064}_{-0.00066}$ | $100\theta_{\mathrm{s,eq}}$           | $0.4518^{+0.0045}_{-0.0043}$    | $\chi_{\mathrm{CMB}}^2$     | $11935.4 (\nu: 17.7)$        |
| $\sigma_8$                                  | $0.806^{+0.015}_{-0.014}$       | $H(0.15)$                             | $72.97^{+0.77}_{-0.75}$         |                             |                              |
| $S_8$                                       | $0.819^{+0.025}_{-0.025}$       | $D_{\mathrm{M}}(0.15)$                | $640.4^{+7.5}_{-7.6}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.15; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.86; R - 1 = 0.01377$$



### 10.11 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02229^{+0.00031}_{-0.00030}$ | $S_8$                                | $0.828^{+0.025}_{-0.025}$       | $H(0.15)$                   | $72.69^{+0.92}_{-0.90}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1197^{+0.0024}_{-0.0024}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.454^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.15)$      | $643.2^{+9.1}_{-9.1}$        |
| $100\theta_{\mathrm{MC}}$                  | $1.04086^{+0.00061}_{-0.00059}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.85^{+0.66}_{-0.65}$      |
| $\tau$                                     | $0.054^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$                   | $0.986^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.38)$      | $1533^{+18}_{-18}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.041^{+0.031}_{-0.030}$       | $r_{\mathrm{drag}}h$                 | $99.2^{+1.9}_{-1.8}$            | $H(0.51)$                   | $89.59^{+0.54}_{-0.52}$      |
| $n_{\mathrm{s}}$                           | $0.9655^{+0.0086}_{-0.0089}$    | $\langle d^2 \rangle^{1/2}$          | $2.437^{+0.044}_{-0.045}$       | $D_{\mathrm{M}}(0.51)$      | $1986^{+21}_{-21}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.001^{+0.013}_{-0.013}$      | $z_{\mathrm{re}}$                    | $7.6^{+1.5}_{-1.6}$             | $H(0.61)$                   | $95.23^{+0.45}_{-0.42}$      |
| $y_{\mathrm{cal}}$                         | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.066}_{-0.062}$       | $D_{\mathrm{M}}(0.61)$      | $2311^{+23}_{-23}$           |
| $A_{100}^{\mathrm{PS}}$                    | $240^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.022}_{-0.022}$       | $H(2.33)$                   | $236.3^{+1.5}_{-1.5}$        |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $D_{40}$                             | $1226^{+34}_{-34}$              | $D_{\mathrm{M}}(2.33)$      | $5767^{+20}_{-21}$           |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $D_{220}$                            | $5719^{+78}_{-74}$              | $f\sigma_8(0.15)$           | $0.458^{+0.012}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+10}_{-10}$                | $D_{810}$                            | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.010}$    |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.49$                        | $D_{1420}$                           | $815.5^{+9.8}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                           | $230.1^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | $0.6622^{+0.0097}_{-0.0093}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $n_{\mathrm{s},0.002}$               | $0.967^{+0.040}_{-0.039}$       | $f\sigma_8(0.51)$           | $0.4738^{+0.0089}_{-0.0089}$ |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6196^{+0.0091}_{-0.0088}$ |
| $A^{\mathrm{kSZ}}$                         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4686^{+0.0081}_{-0.0081}$ |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.39}_{-0.37}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.601^{+0.058}_{-0.057}$       | $\sigma_8(0.61)$            | $0.5895^{+0.0087}_{-0.0084}$ |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.35}_{-0.36}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.806^{+0.046}_{-0.047}$      | $f\sigma_8(2.33)$           | $0.2971^{+0.0045}_{-0.0044}$ |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $z_*$                                | $1089.99^{+0.51}_{-0.52}$       | $\sigma_8(2.33)$            | $0.3062^{+0.0049}_{-0.0048}$ |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.31}$          | $r_*$                                | $144.57^{+0.56}_{-0.56}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                                  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                        | $1.04105^{+0.00060}_{-0.00058}$ | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.3}$        |
| $c_{217}$                                  | $1.0011^{+0.0032}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.887^{+0.053}_{-0.053}$      | $f_{2000}^{143\times 217}$  | $32^{+5}_{-4}$               |
| $c_{TE}$                                   | $0.9967^{+0.0098}_{-0.0099}$    | $z_{\mathrm{drag}}$                  | $1059.73^{+0.66}_{-0.67}$       | $\chi_{\mathrm{lensing}}^2$ | $9.33\ (\nu: 0.3)$           |
| $c_{EE}$                                   | $0.9922^{+0.0099}_{-0.0095}$    | $r_{\mathrm{drag}}$                  | $147.26^{+0.57}_{-0.58}$        | $\chi_{\mathrm{simall}}^2$  | $396.9\ (\nu: 1.4)$          |
| $H_0$                                      | $67.4^{+1.1}_{-1.1}$            | $k_{\mathrm{D}}$                     | $0.14062^{+0.00068}_{-0.00068}$ | $\chi_{\mathrm{lowl}}^2$    | $23.4\ (\nu: 1.8)$           |
| $\Omega_{\Lambda}$                         | $0.686^{+0.014}_{-0.015}$       | $100\theta_{\mathrm{D}}$             | $0.16087^{+0.00039}_{-0.00039}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.9\ (\nu: 17.0)$       |
| $\Omega_{\mathrm{m}}$                      | $0.314^{+0.015}_{-0.014}$       | $z_{\mathrm{eq}}$                    | $3393^{+54}_{-54}$              | $\chi_{\mathrm{prior}}^2$   | $7.7\ (\nu: 5.9)$            |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1426^{+0.0023}_{-0.0023}$    | $k_{\mathrm{eq}}$                    | $0.01036^{+0.00017}_{-0.00016}$ | $\chi_{\mathrm{CMB}}^2$     | $11944.5\ (\nu: 18.0)$       |
| $\Omega_{\mathrm{m}}h^3$                   | $0.09610^{+0.00064}_{-0.00065}$ | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.010}_{-0.010}$       |                             |                              |
| $\sigma_8$                                 | $0.809^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4502^{+0.0053}_{-0.0052}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11952.22; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.78; R - 1 = 0.01144$$



## 10.12 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02233^{+0.00030}_{-0.00030}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.01^{+0.54}_{-0.53}$      |
| $\Omega_{\text{c}}h^2$               | $0.1191^{+0.0018}_{-0.0019}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.603^{+0.011}_{-0.011}$       | $D_{\text{M}}(0.38)$        | $1529^{+14}_{-14}$           |
| $100\theta_{\text{MC}}$              | $1.04094^{+0.00059}_{-0.00057}$ | $\sigma_8/h^{0.5}$                 | $0.983^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.71^{+0.44}_{-0.43}$      |
| $\tau$                               | $0.055^{+0.015}_{-0.014}$       | $r_{\text{drag}}h$                 | $99.7^{+1.5}_{-1.4}$            | $D_{\text{M}}(0.51)$        | $1981^{+17}_{-17}$           |
| $\ln(10^{10}A_{\text{s}})$           | $3.043^{+0.031}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$        | $2.431^{+0.042}_{-0.042}$       | $H(0.61)$                   | $95.33^{+0.38}_{-0.37}$      |
| $n_{\text{s}}$                       | $0.9669^{+0.0080}_{-0.0078}$    | $z_{\text{re}}$                    | $7.8^{+1.5}_{-1.5}$             | $D_{\text{M}}(0.61)$        | $2305^{+18}_{-18}$           |
| $\text{d}n_{\text{s}}/\text{d}\ln k$ | $0.000^{+0.013}_{-0.013}$       | $10^9 A_{\text{s}}$                | $2.097^{+0.066}_{-0.059}$       | $H(2.33)$                   | $235.9^{+1.1}_{-1.2}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0048}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.877^{+0.022}_{-0.022}$       | $D_{\text{M}}(2.33)$        | $5763^{+18}_{-18}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                           | $1225^{+34}_{-34}$              | $f\sigma_8(0.15)$           | $0.455^{+0.010}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                          | $5724^{+80}_{-74}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.010}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                          | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4736^{+0.0089}_{-0.0089}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{1420}$                         | $816.1^{+9.6}_{-9.6}$           | $\sigma_8(0.38)$            | $0.6623^{+0.0097}_{-0.0091}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.47$                        | $D_{2000}$                         | $230.4^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.4723^{+0.0082}_{-0.0081}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{\text{s},0.002}$               | $0.968^{+0.040}_{-0.039}$       | $\sigma_8(0.51)$            | $0.6198^{+0.0091}_{-0.0086}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4674^{+0.0077}_{-0.0076}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5898^{+0.0087}_{-0.0083}$ |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$           | $2.594^{+0.056}_{-0.055}$       | $f\sigma_8(2.33)$           | $0.2974^{+0.0045}_{-0.0042}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.37}$          | $\text{Age}/\text{Gyr}$            | $13.797^{+0.041}_{-0.042}$      | $\sigma_8(2.33)$            | $0.3067^{+0.0048}_{-0.0045}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.36}$          | $z_*$                              | $1089.89^{+0.46}_{-0.45}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                              | $144.70^{+0.47}_{-0.45}$        | $f_{2000}^{217}$            | $106.9^{+4.0}_{-4.3}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.31}$          | $100\theta_*$                      | $1.04113^{+0.00059}_{-0.00056}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.898^{+0.045}_{-0.043}$      | $\chi_{\text{lensing}}^2$   | $9.32 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$                  | $1059.78^{+0.65}_{-0.68}$       | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.9968^{+0.0097}_{-0.0099}$    | $r_{\text{drag}}$                  | $147.38^{+0.51}_{-0.49}$        | $\chi_{\text{lowl}}^2$      | $23.2 (\nu: 1.8)$            |
| $c_{EE}$                             | $0.9925^{+0.0098}_{-0.0096}$    | $k_{\text{D}}$                     | $0.14053^{+0.00064}_{-0.00065}$ | $\chi_{\text{CamSpec}}^2$   | $11514.8 (\nu: 16.9)$        |
| $H_0$                                | $67.65^{+0.83}_{-0.82}$         | $100\theta_{\text{D}}$             | $0.16085^{+0.00039}_{-0.00037}$ | $\chi_{6\text{DF}}^2$       | $0.048 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | $0.689^{+0.011}_{-0.011}$       | $z_{\text{eq}}$                    | $3380^{+41}_{-43}$              | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$            |
| $\Omega_{\text{m}}$                  | $0.311^{+0.011}_{-0.011}$       | $k_{\text{eq}}$                    | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 0.8)$             |
| $\Omega_{\text{m}}h^2$               | $0.1421^{+0.0017}_{-0.0018}$    | $100\theta_{\text{eq}}$            | $0.8173^{+0.0082}_{-0.0077}$    | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.9)$             |
| $\Omega_{\text{m}}h^3$               | $0.09610^{+0.00064}_{-0.00066}$ | $100\theta_{\text{s,eq}}$          | $0.4515^{+0.0042}_{-0.0039}$    | $\chi_{\text{CMB}}^2$       | $11944.4 (\nu: 17.7)$        |
| $\sigma_8$                           | $0.808^{+0.012}_{-0.011}$       | $H(0.15)$                          | $72.92^{+0.71}_{-0.70}$         | $\chi_{\text{BAO}}^2$       | $6.02 (\nu: 0.5)$            |
| $S_8$                                | $0.822^{+0.020}_{-0.021}$       | $D_{\text{M}}(0.15)$               | $641.0^{+7.0}_{-7.0}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11958.12; \Delta\bar{\chi}_{\text{eff}}^2 = 0.72; R - 1 = 0.01586$$



### 10.13 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                  | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02242^{+0.00030}_{-0.00031}$ | $S_8$                              | $0.810^{+0.030}_{-0.030}$       | $H(0.15)$                  | $73.33^{+0.95}_{-0.96}$      |
| $\Omega_{\text{c}}h^2$               | $0.1181^{+0.0025}_{-0.0024}$    | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.443^{+0.016}_{-0.016}$       | $D_{\text{M}}(0.15)$       | $636.9^{+9.5}_{-9.2}$        |
| $100\theta_{\text{MC}}$              | $1.04107^{+0.00057}_{-0.00060}$ | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.597^{+0.016}_{-0.016}$       | $H(0.38)$                  | $83.31^{+0.67}_{-0.70}$      |
| $\tau$                               | $0.055^{+0.017}_{-0.016}$       | $\sigma_8/h^{0.5}$                 | $0.974^{+0.023}_{-0.022}$       | $D_{\text{M}}(0.38)$       | $1521^{+19}_{-18}$           |
| $\ln(10^{10}A_{\text{s}})$           | $3.040^{+0.037}_{-0.034}$       | $r_{\text{drag}}h$                 | $100.5^{+1.9}_{-1.9}$           | $H(0.51)$                  | $89.95^{+0.54}_{-0.56}$      |
| $n_{\text{s}}$                       | $0.9696^{+0.0088}_{-0.0090}$    | $\langle d^2 \rangle^{1/2}$        | $2.410^{+0.054}_{-0.055}$       | $D_{\text{M}}(0.51)$       | $1971^{+22}_{-21}$           |
| $\text{d}n_{\text{s}}/\text{d}\ln k$ | $0.000^{+0.013}_{-0.013}$       | $z_{\text{re}}$                    | $7.7^{+1.7}_{-1.7}$             | $H(0.61)$                  | $95.51^{+0.45}_{-0.45}$      |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0050}$    | $10^9 A_{\text{s}}$                | $2.090^{+0.078}_{-0.070}$       | $D_{\text{M}}(0.61)$       | $2295^{+24}_{-23}$           |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.872^{+0.024}_{-0.024}$       | $H(2.33)$                  | $235.3^{+1.5}_{-1.5}$        |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                           | $1218^{+36}_{-35}$              | $D_{\text{M}}(2.33)$       | $5755^{+21}_{-21}$           |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                          | $5725^{+76}_{-71}$              | $f\sigma_8(0.15)$          | $0.449^{+0.015}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{810}$                          | $2534^{+27}_{-26}$              | $\sigma_8(0.15)$           | $0.744^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.59$                        | $D_{1420}$                         | $816.6^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$          | $0.468^{+0.013}_{-0.013}$    |
| $r_{143\times 217}^{\text{PS}}$      | $0.66^{+0.26}_{-0.26}$          | $D_{2000}$                         | $230.6^{+3.6}_{-3.5}$           | $\sigma_8(0.38)$           | $0.660^{+0.012}_{-0.011}$    |
| $r_{143\times 217}^{\text{CIB}}$     | —                               | $n_{\text{s},0.002}$               | $0.971^{+0.043}_{-0.039}$       | $f\sigma_8(0.51)$          | $0.468^{+0.012}_{-0.012}$    |
| $\xi^{\text{tSZ}\times\text{CIB}}$   | —                               | $Y_{\text{P}}$                     | $0.24541^{+0.00011}_{-0.00013}$ | $\sigma_8(0.51)$           | $0.618^{+0.011}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24674^{+0.00011}_{-0.00013}$ | $f\sigma_8(0.61)$          | $0.463^{+0.011}_{-0.010}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.40}_{-0.39}$          | $10^5\text{D}/\text{H}$            | $2.578^{+0.059}_{-0.054}$       | $\sigma_8(0.61)$           | $0.588^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $\text{Age}/\text{Gyr}$            | $13.780^{+0.047}_{-0.046}$      | $f\sigma_8(2.33)$          | $0.2969^{+0.0054}_{-0.0050}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $z_*$                              | $1089.69^{+0.53}_{-0.49}$       | $\sigma_8(2.33)$           | $0.3064^{+0.0057}_{-0.0051}$ |
| $A_{143\times 217}^{\text{dust}}$    | $1.03^{+0.31}_{-0.32}$          | $r_*$                              | $144.90^{+0.60}_{-0.59}$        | $f_{2000}^{143}$           | $29^{+6}_{-6}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                      | $1.04125^{+0.00057}_{-0.00059}$ | $f_{2000}^{217}$           | $106.6^{+4.1}_{-4.2}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0032}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.916^{+0.059}_{-0.055}$      | $f_{2000}^{143\times 217}$ | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9969^{+0.0098}_{-0.0098}$    | $z_{\text{drag}}$                  | $1059.90^{+0.68}_{-0.66}$       | $\chi_{\text{simall}}^2$   | $397.1 (\nu: 2.0)$           |
| $c_{EE}$                             | $0.9923^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$                  | $147.55^{+0.61}_{-0.61}$        | $\chi_{\text{lowl}}^2$     | $22.7 (\nu: 1.5)$            |
| $H_0$                                | $68.1^{+1.1}_{-1.1}$            | $k_{\text{D}}$                     | $0.14042^{+0.00072}_{-0.00073}$ | $\chi_{\text{CamSpec}}^2$  | $11517.0 (\nu: 20.4)$        |
| $\Omega_{\Lambda}$                   | $0.696^{+0.014}_{-0.015}$       | $100\theta_{\text{D}}$             | $0.16078^{+0.00038}_{-0.00038}$ | $\chi_{\text{H073p45}}^2$  | $10.4 (\nu: 2.4)$            |
| $\Omega_{\text{m}}$                  | $0.304^{+0.015}_{-0.014}$       | $z_{\text{eq}}$                    | $3357^{+58}_{-55}$              | $\chi_{\text{prior}}^2$    | $7.8 (\nu: 6.0)$             |
| $\Omega_{\text{m}}h^2$               | $0.1411^{+0.0024}_{-0.0023}$    | $k_{\text{eq}}$                    | $0.01025^{+0.00018}_{-0.00017}$ | $\chi_{\text{CMB}}^2$      | $11936.8 (\nu: 19.8)$        |
| $\Omega_{\text{m}}h^3$               | $0.09614^{+0.00067}_{-0.00067}$ | $100\theta_{\text{eq}}$            | $0.822^{+0.011}_{-0.011}$       |                            |                              |
| $\sigma_8$                           | $0.804^{+0.015}_{-0.015}$       | $100\theta_{\text{s,eq}}$          | $0.4537^{+0.0055}_{-0.0056}$    |                            |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11955.07; \Delta\bar{\chi}_{\text{eff}}^2 = 0.80; R - 1 = 0.04651$$



# 10.14 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$   | $0.02230^{+0.00032}_{-0.00031}$ | $\sigma_8$                            | $0.809^{+0.015}_{-0.013}$       | $100\theta_{\mathrm{eq}}$   | $0.815^{+0.012}_{-0.012}$    |
| $\Omega_{\mathrm{c}} h^2$   | $0.1196^{+0.0028}_{-0.0027}$    | $S_8$                                 | $0.827^{+0.032}_{-0.031}$       | $100\theta_{\mathrm{s,eq}}$ | $0.4504^{+0.0060}_{-0.0060}$ |
| $100\theta_{\mathrm{MC}}$   | $1.04088^{+0.00062}_{-0.00059}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.453^{+0.018}_{-0.017}$       | $H(0.15)$                   | $72.7^{+1.0}_{-1.0}$         |
| $\tau$  | $0.054^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $643^{+10}_{-10}$            |
| $\ln(10^{10} A_{\mathrm{s}})$   | $3.042^{+0.030}_{-0.027}$       | $\sigma_8/h^{0.5}$                    | $0.985^{+0.023}_{-0.022}$       | $H(0.38)$                   | $82.88^{+0.74}_{-0.73}$      |
| $n_{\mathrm{s}}$  | $0.9658^{+0.0094}_{-0.0096}$    | $r_{\mathrm{drag}} h$                 | $99.3^{+2.1}_{-2.1}$            | $D_{\mathrm{M}}(0.38)$      | $1533^{+20}_{-20}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$  | $-0.001^{+0.013}_{-0.013}$      | $\langle d^2 \rangle^{1/2}$           | $2.435^{+0.054}_{-0.053}$       | $H(0.51)$                   | $89.62^{+0.59}_{-0.57}$      |
| $y_{\mathrm{cal}}$  | $1.0004^{+0.0049}_{-0.0049}$    | $z_{\mathrm{re}}$                     | $< 8.91$                        | $D_{\mathrm{M}}(0.51)$      | $1985^{+24}_{-24}$           |
| $A_{100}^{\mathrm{PS}}$   | $241^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | $2.095^{+0.064}_{-0.056}$       | $H(0.61)$                   | $95.25^{+0.48}_{-0.45}$      |
| $A_{143}^{\mathrm{PS}}$   | $40^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.024}_{-0.024}$       | $D_{\mathrm{M}}(0.61)$      | $2310^{+26}_{-26}$           |
| $A_{217}^{\mathrm{PS}}$   | $102^{+30}_{-30}$               | $D_{40}$                              | $1223^{+36}_{-34}$              | $H(2.33)$                   | $236.2^{+1.7}_{-1.6}$        |
| $A_{217}^{\mathrm{CIB}}$  | $40^{+10}_{-10}$                | $D_{220}$                             | $5716^{+76}_{-73}$              | $D_{\mathrm{M}}(2.33)$      | $5766^{+21}_{-22}$           |
| $A_{143}^{\mathrm{tSZ}}$  | $< 7.51$                        | $D_{810}$                             | $2535^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$  | $0.65^{+0.25}_{-0.25}$          | $D_{1420}$                            | $815.2^{+9.8}_{-9.7}$           | $\sigma_8(0.15)$            | $0.747^{+0.013}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$   | —                               | $D_{2000}$                            | $230.0^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$  | —                               | $n_{\mathrm{s},0.002}$                | $0.970^{+0.040}_{-0.040}$       | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0095}$   |
| $A^{\mathrm{kSZ}}$  | —                               | $Y_{\mathrm{P}}$                      | $0.24537^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | $0.474^{+0.012}_{-0.011}$    |
| $A_{100}^{\mathrm{dust}}$   | $1.01^{+0.39}_{-0.38}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6197^{+0.0094}_{-0.0087}$ |
| $A_{143}^{\mathrm{dust}}$   | $0.97^{+0.35}_{-0.36}$          | $10^5 \mathrm{D}/\mathrm{H}$          | $2.599^{+0.060}_{-0.058}$       | $f\sigma_8(0.61)$           | $0.468^{+0.011}_{-0.010}$    |
| $A_{217}^{\mathrm{dust}}$   | $0.97^{+0.20}_{-0.20}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.804^{+0.048}_{-0.049}$      | $\sigma_8(0.61)$            | $0.5896^{+0.0089}_{-0.0082}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$  | $1.03^{+0.32}_{-0.31}$          | $z_*$                                 | $1089.97^{+0.55}_{-0.54}$       | $f\sigma_8(2.33)$           | $0.2972^{+0.0044}_{-0.0040}$ |
| $c_{100}$   | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                                 | $144.59^{+0.63}_{-0.64}$        | $\sigma_8(2.33)$            | $0.3063^{+0.0045}_{-0.0042}$ |
| $c_{217}$   | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$                         | $1.04107^{+0.00061}_{-0.00059}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{TE}$  | $0.9966^{+0.0098}_{-0.0098}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.889^{+0.058}_{-0.060}$      | $f_{2000}^{217}$            | $107.0^{+4.3}_{-4.3}$        |
| $c_{EE}$  | $0.9921^{+0.0099}_{-0.0097}$    | $z_{\mathrm{drag}}$                   | $1059.74^{+0.69}_{-0.65}$       | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-4}$               |
| $H_0$   | $67.4^{+1.2}_{-1.2}$            | $r_{\mathrm{drag}}$                   | $147.28^{+0.64}_{-0.66}$        | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.4)$           |
| $\Omega_{\Lambda}$  | $0.686^{+0.016}_{-0.017}$       | $k_{\mathrm{D}}$                      | $0.14061^{+0.00074}_{-0.00073}$ | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 1.7)$            |
| $\Omega_{\mathrm{m}}$   | $0.314^{+0.017}_{-0.016}$       | $100\theta_{\mathrm{D}}$              | $0.16086^{+0.00040}_{-0.00039}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11515.3 (\nu: 17.4)$        |
| $\Omega_{\mathrm{m}} h^2$   | $0.1425^{+0.0026}_{-0.0025}$    | $z_{\mathrm{eq}}$                     | $3391^{+63}_{-61}$              | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\Omega_{\mathrm{m}} h^3$   | $0.09610^{+0.00065}_{-0.00065}$ | $k_{\mathrm{eq}}$                     | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{\mathrm{CMB}}^2$     | $11935.2 (\nu: 17.1)$        |
| $\bar{\chi}_{\mathrm{eff}}^2 = 11943.05; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.86; R - 1 = 0.00888$ |                                 |                                       |                                 |                             |                              |



10.15 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02234^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.449^{+0.014}_{-0.013}$       | $H(0.38)$                   | $83.05^{+0.58}_{-0.55}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1189^{+0.0019}_{-0.0020}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.602^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+15}_{-15}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04095^{+0.00058}_{-0.00057}$ | $\sigma_8/h^{0.5}$                    | $0.981^{+0.020}_{-0.019}$       | $H(0.51)$                   | $89.75^{+0.46}_{-0.45}$      |
| $\tau$                                      | $0.055^{+0.014}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.6}_{-1.5}$            | $D_{\mathrm{M}}(0.51)$      | $1979^{+18}_{-18}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.042^{+0.031}_{-0.027}$       | $\langle d^2 \rangle^{1/2}$           | $2.425^{+0.048}_{-0.047}$       | $H(0.61)$                   | $95.35^{+0.39}_{-0.38}$      |
| $n_{\mathrm{s}}$                            | $0.9674^{+0.0083}_{-0.0080}$    | $z_{\mathrm{re}}$                     | $< 8.96$                        | $D_{\mathrm{M}}(0.61)$      | $2303^{+19}_{-19}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.001^{+0.013}_{-0.013}$      | $10^9 A_{\mathrm{s}}$                 | $2.094^{+0.064}_{-0.056}$       | $H(2.33)$                   | $235.8^{+1.2}_{-1.2}$        |
| $y_{\mathrm{cal}}$                          | $1.0004^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+18}_{-19}$           |
| $A_{100}^{\mathrm{PS}}$                     | $240^{+50}_{-50}$               | $D_{40}$                              | $1221^{+35}_{-34}$              | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                     | $39^{+20}_{-20}$                | $D_{220}$                             | $5719^{+79}_{-73}$              | $\sigma_8(0.15)$            | $0.746^{+0.012}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                     | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $40^{+20}_{-10}$                | $D_{1420}$                            | $815.8^{+9.6}_{-9.6}$           | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0093}$   |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.54$                        | $D_{2000}$                            | $230.3^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.4714^{+0.0098}_{-0.0096}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.970^{+0.040}_{-0.040}$       | $\sigma_8(0.51)$            | $0.6193^{+0.0094}_{-0.0086}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4666^{+0.0092}_{-0.0088}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5893^{+0.0089}_{-0.0081}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.592^{+0.057}_{-0.054}$       | $f\sigma_8(2.33)$           | $0.2972^{+0.0044}_{-0.0040}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.39}_{-0.37}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.795^{+0.041}_{-0.043}$      | $\sigma_8(2.33)$            | $0.3065^{+0.0046}_{-0.0041}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.96^{+0.35}_{-0.35}$          | $z_*$                                 | $1089.87^{+0.46}_{-0.46}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.21}_{-0.20}$          | $r_*$                                 | $144.73^{+0.50}_{-0.49}$        | $f_{2000}^{217}$            | $106.9^{+4.1}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.31}_{-0.31}$          | $100\theta_*$                         | $1.04114^{+0.00058}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.901^{+0.047}_{-0.046}$      | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.5)$           |
| $c_{217}$                                   | $1.0011^{+0.0032}_{-0.0032}$    | $z_{\mathrm{drag}}$                   | $1059.78^{+0.64}_{-0.65}$       | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 1.6)$            |
| $c_{TE}$                                    | $0.9968^{+0.0098}_{-0.0099}$    | $r_{\mathrm{drag}}$                   | $147.41^{+0.54}_{-0.52}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11515.3 (\nu: 17.7)$        |
| $c_{EE}$                                    | $0.9924^{+0.0099}_{-0.0097}$    | $k_{\mathrm{D}}$                      | $0.14050^{+0.00066}_{-0.00068}$ | $\chi_{6\mathrm{DF}}^2$     | $0.044 (\nu: 0.0)$           |
| $H_0$                                       | $67.72^{+0.90}_{-0.86}$         | $100\theta_{\mathrm{D}}$              | $0.16084^{+0.00040}_{-0.00037}$ | $\chi_{\mathrm{MGS}}^2$     | $1.37 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                          | $0.690^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3376^{+45}_{-46}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.5 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}}$                       | $0.310^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1419^{+0.0019}_{-0.0019}$    | $100\theta_{\mathrm{eq}}$             | $0.8180^{+0.0086}_{-0.0083}$    | $\chi_{\mathrm{BAO}}^2$     | $5.96 (\nu: 0.5)$            |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09610^{+0.00063}_{-0.00066}$ | $100\theta_{\mathrm{s,eq}}$           | $0.4519^{+0.0044}_{-0.0043}$    | $\chi_{\mathrm{CMB}}^2$     | $11935.1 (\nu: 17.2)$        |
| $\sigma_8$                                  | $0.807^{+0.014}_{-0.012}$       | $H(0.15)$                             | $72.98^{+0.77}_{-0.75}$         |                             |                              |
| $S_8$                                       | $0.820^{+0.025}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$                | $640.4^{+7.5}_{-7.5}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.86; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.87; R - 1 = 0.01438$$



# 10.16 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02230^{+0.00031}_{-0.00030}$ | $S_8$                                | $0.828^{+0.025}_{-0.025}$       | $H(0.15)$                   | $72.72^{+0.90}_{-0.87}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1196^{+0.0023}_{-0.0023}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.454^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.15)$      | $643.0^{+8.7}_{-8.9}$        |
| $100\theta_{\mathrm{MC}}$                  | $1.04087^{+0.00060}_{-0.00058}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.012}_{-0.012}$       | $H(0.38)$                   | $82.87^{+0.65}_{-0.63}$      |
| $\tau$                                     | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$                   | $0.986^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1533^{+17}_{-18}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.043^{+0.027}_{-0.025}$       | $r_{\mathrm{drag}}h$                 | $99.3^{+1.8}_{-1.7}$            | $H(0.51)$                   | $89.61^{+0.53}_{-0.50}$      |
| $n_{\mathrm{s}}$                           | $0.9656^{+0.0086}_{-0.0087}$    | $\langle d^2 \rangle^{1/2}$          | $2.438^{+0.043}_{-0.044}$       | $D_{\mathrm{M}}(0.51)$      | $1985^{+20}_{-21}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.001^{+0.013}_{-0.013}$      | $z_{\mathrm{re}}$                    | $< 8.90$                        | $H(0.61)$                   | $95.24^{+0.44}_{-0.41}$      |
| $y_{\mathrm{cal}}$                         | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$                | $2.097^{+0.058}_{-0.052}$       | $D_{\mathrm{M}}(0.61)$      | $2310^{+22}_{-22}$           |
| $A_{100}^{\mathrm{PS}}$                    | $240^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.022}_{-0.022}$       | $H(2.33)$                   | $236.2^{+1.4}_{-1.4}$        |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $D_{40}$                             | $1226^{+34}_{-34}$              | $D_{\mathrm{M}}(2.33)$      | $5766^{+20}_{-21}$           |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $D_{220}$                            | $5719^{+78}_{-74}$              | $f\sigma_8(0.15)$           | $0.458^{+0.012}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+10}_{-10}$                | $D_{810}$                            | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.010}_{-0.0092}$   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.50$                        | $D_{1420}$                           | $815.4^{+9.7}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                           | $230.1^{+3.6}_{-3.6}$           | $\sigma_8(0.38)$            | $0.6628^{+0.0088}_{-0.0082}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $n_{\mathrm{s},0.002}$               | $0.968^{+0.040}_{-0.039}$       | $f\sigma_8(0.51)$           | $0.4741^{+0.0087}_{-0.0087}$ |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.6201^{+0.0082}_{-0.0076}$ |
| $A^{\mathrm{kSZ}}$                         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4689^{+0.0079}_{-0.0079}$ |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.39}_{-0.37}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.600^{+0.058}_{-0.056}$       | $\sigma_8(0.61)$            | $0.5900^{+0.0079}_{-0.0073}$ |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.35}_{-0.35}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.805^{+0.045}_{-0.047}$      | $f\sigma_8(2.33)$           | $0.2974^{+0.0040}_{-0.0037}$ |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $z_*$                                | $1089.98^{+0.50}_{-0.51}$       | $\sigma_8(2.33)$            | $0.3065^{+0.0043}_{-0.0040}$ |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.31}$          | $r_*$                                | $144.59^{+0.56}_{-0.55}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                                  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                        | $1.04106^{+0.00059}_{-0.00057}$ | $f_{2000}^{217}$            | $107.0^{+4.2}_{-4.3}$        |
| $c_{217}$                                  | $1.0011^{+0.0032}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.888^{+0.053}_{-0.052}$      | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $c_{TE}$                                   | $0.9966^{+0.0097}_{-0.0099}$    | $z_{\mathrm{drag}}$                  | $1059.74^{+0.65}_{-0.65}$       | $\chi_{\mathrm{lensing}}^2$ | $9.28\ (\nu: 0.2)$           |
| $c_{EE}$                                   | $0.9922^{+0.0099}_{-0.0095}$    | $r_{\mathrm{drag}}$                  | $147.27^{+0.57}_{-0.57}$        | $\chi_{\mathrm{simall}}^2$  | $396.9\ (\nu: 1.4)$          |
| $H_0$                                      | $67.4^{+1.0}_{-1.0}$            | $k_{\mathrm{D}}$                     | $0.14062^{+0.00068}_{-0.00068}$ | $\chi_{\mathrm{lowl}}^2$    | $23.3\ (\nu: 1.8)$           |
| $\Omega_{\Lambda}$                         | $0.686^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{D}}$             | $0.16087^{+0.00039}_{-0.00038}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.7\ (\nu: 16.9)$       |
| $\Omega_{\mathrm{m}}$                      | $0.314^{+0.014}_{-0.014}$       | $z_{\mathrm{eq}}$                    | $3391^{+53}_{-53}$              | $\chi_{\mathrm{prior}}^2$   | $7.7\ (\nu: 5.9)$            |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1426^{+0.0022}_{-0.0022}$    | $k_{\mathrm{eq}}$                    | $0.01035^{+0.00016}_{-0.00016}$ | $\chi_{\mathrm{CMB}}^2$     | $11944.2\ (\nu: 17.4)$       |
| $\Omega_{\mathrm{m}}h^3$                   | $0.09610^{+0.00064}_{-0.00065}$ | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.010}_{-0.0099}$      |                             |                              |
| $\sigma_8$                                 | $0.810^{+0.012}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4503^{+0.0052}_{-0.0051}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11951.93; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.68; R - 1 = 0.01119$$



10.17 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02233^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.02^{+0.53}_{-0.53}$      |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1191^{+0.0018}_{-0.0019}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$      | $1529^{+14}_{-14}$           |
| $100\theta_{\mathrm{MC}}$                   | $1.04094^{+0.00059}_{-0.00056}$ | $\sigma_8/h^{0.5}$                    | $0.983^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.72^{+0.44}_{-0.43}$      |
| $\tau$                                      | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $99.7^{+1.4}_{-1.4}$            | $D_{\mathrm{M}}(0.51)$      | $1980^{+17}_{-17}$           |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.044^{+0.028}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$           | $2.432^{+0.041}_{-0.041}$       | $H(0.61)$                   | $95.33^{+0.38}_{-0.37}$      |
| $n_{\mathrm{s}}$                            | $0.9670^{+0.0080}_{-0.0077}$    | $z_{\mathrm{re}}$                     | $7.8^{+1.2}_{-1.3}$             | $D_{\mathrm{M}}(0.61)$      | $2305^{+18}_{-18}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $0.000^{+0.013}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.059}_{-0.054}$       | $H(2.33)$                   | $235.9^{+1.1}_{-1.2}$        |
| $y_{\mathrm{cal}}$                          | $1.0006^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5763^{+18}_{-18}$           |
| $A_{100}^{\mathrm{PS}}$                     | $240^{+50}_{-50}$               | $D_{40}$                              | $1225^{+35}_{-34}$              | $f\sigma_8(0.15)$           | $0.455^{+0.010}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                     | $39^{+20}_{-20}$                | $D_{220}$                             | $5723^{+80}_{-74}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0093}$   |
| $A_{217}^{\mathrm{PS}}$                     | $103^{+30}_{-30}$               | $D_{810}$                             | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.4738^{+0.0088}_{-0.0088}$ |
| $A_{217}^{\mathrm{CIB}}$                    | $40^{+20}_{-10}$                | $D_{1420}$                            | $816.0^{+9.5}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6627^{+0.0094}_{-0.0080}$ |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.49$                        | $D_{2000}$                            | $230.4^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.4725^{+0.0080}_{-0.0078}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.968^{+0.040}_{-0.039}$       | $\sigma_8(0.51)$            | $0.6202^{+0.0089}_{-0.0075}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.4676^{+0.0076}_{-0.0072}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.5902^{+0.0081}_{-0.0074}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.593^{+0.056}_{-0.054}$       | $f\sigma_8(2.33)$           | $0.2976^{+0.0041}_{-0.0038}$ |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.39}_{-0.37}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.797^{+0.041}_{-0.042}$      | $\sigma_8(2.33)$            | $0.3069^{+0.0043}_{-0.0040}$ |
| $A_{143}^{\mathrm{dust}}$                   | $0.96^{+0.35}_{-0.36}$          | $z_*$                                 | $1089.89^{+0.46}_{-0.44}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $144.70^{+0.48}_{-0.45}$        | $f_{2000}^{217}$            | $106.9^{+4.0}_{-4.3}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.31}_{-0.31}$          | $100\theta_*$                         | $1.04113^{+0.00059}_{-0.00056}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                   | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.898^{+0.045}_{-0.043}$      | $\chi_{\mathrm{lensing}}^2$ | $9.27 (\nu: 0.2)$            |
| $c_{217}$                                   | $1.0011^{+0.0032}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.78^{+0.65}_{-0.65}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                                    | $0.9967^{+0.0097}_{-0.0098}$    | $r_{\mathrm{drag}}$                   | $147.38^{+0.52}_{-0.49}$        | $\chi_{\mathrm{lowl}}^2$    | $23.2 (\nu: 1.8)$            |
| $c_{EE}$                                    | $0.9925^{+0.0099}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14053^{+0.00063}_{-0.00065}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.7 (\nu: 16.8)$        |
| $H_0$                                       | $67.66^{+0.82}_{-0.81}$         | $100\theta_{\mathrm{D}}$              | $0.16084^{+0.00039}_{-0.00037}$ | $\chi_{6\mathrm{DF}}^2$     | $0.046 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                          | $0.690^{+0.011}_{-0.011}$       | $z_{\mathrm{eq}}$                     | $3379^{+41}_{-43}$              | $\chi_{\mathrm{MGS}}^2$     | $1.30 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}$                       | $0.310^{+0.011}_{-0.011}$       | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00012}_{-0.00013}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1421^{+0.0017}_{-0.0018}$    | $100\theta_{\mathrm{eq}}$             | $0.8174^{+0.0082}_{-0.0075}$    | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09611^{+0.00064}_{-0.00065}$ | $100\theta_{\mathrm{s,eq}}$           | $0.4515^{+0.0042}_{-0.0039}$    | $\chi_{\mathrm{CMB}}^2$     | $11944.2 (\nu: 17.3)$        |
| $\sigma_8$                                  | $0.809^{+0.012}_{-0.010}$       | $H(0.15)$                             | $72.93^{+0.71}_{-0.70}$         | $\chi_{\mathrm{BAO}}^2$     | $6.00 (\nu: 0.4)$            |
| $S_8$                                       | $0.823^{+0.020}_{-0.020}$       | $D_{\mathrm{M}}(0.15)$                | $640.9^{+7.0}_{-6.9}$           |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11957.93; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.67; R - 1 = 0.01735$$



## 10.18 base\_nrun\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02242^{+0.00030}_{-0.00031}$ | $S_8$                                | $0.810^{+0.030}_{-0.030}$       | $H(0.15)$                   | $73.34^{+0.94}_{-0.95}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1181^{+0.0025}_{-0.0024}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.444^{+0.016}_{-0.017}$       | $D_{\mathrm{M}}(0.15)$      | $636.8^{+9.4}_{-9.1}$        |
| $100\theta_{\mathrm{MC}}$                  | $1.04107^{+0.00057}_{-0.00060}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.598^{+0.016}_{-0.015}$       | $H(0.38)$                   | $83.32^{+0.68}_{-0.69}$      |
| $\tau$                                     | $0.056^{+0.015}_{-0.013}$       | $\sigma_8/h^{0.5}$                   | $0.975^{+0.023}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$      | $1521^{+19}_{-18}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.042^{+0.032}_{-0.028}$       | $r_{\mathrm{drag}}h$                 | $100.5^{+2.0}_{-1.9}$           | $H(0.51)$                   | $89.96^{+0.54}_{-0.55}$      |
| $n_{\mathrm{s}}$                           | $0.9697^{+0.0087}_{-0.0090}$    | $\langle d^2 \rangle^{1/2}$          | $2.412^{+0.053}_{-0.054}$       | $D_{\mathrm{M}}(0.51)$      | $1971^{+22}_{-21}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.001^{+0.013}_{-0.013}$      | $z_{\mathrm{re}}$                    | $< 9.13$                        | $H(0.61)$                   | $95.52^{+0.44}_{-0.45}$      |
| $y_{\mathrm{cal}}$                         | $1.0005^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$                | $2.095^{+0.067}_{-0.059}$       | $D_{\mathrm{M}}(0.61)$      | $2294^{+24}_{-23}$           |
| $A_{100}^{\mathrm{PS}}$                    | $239^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.872^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.3^{+1.5}_{-1.5}$        |
| $A_{143}^{\mathrm{PS}}$                    | $39^{+20}_{-20}$                | $D_{40}$                             | $1217^{+37}_{-35}$              | $D_{\mathrm{M}}(2.33)$      | $5755^{+21}_{-21}$           |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $D_{220}$                            | $5725^{+76}_{-71}$              | $f\sigma_8(0.15)$           | $0.449^{+0.015}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                   | $39^{+20}_{-10}$                | $D_{810}$                            | $2534^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.745^{+0.013}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.65$                        | $D_{1420}$                           | $816.6^{+9.6}_{-9.5}$           | $f\sigma_8(0.38)$           | $0.469^{+0.013}_{-0.013}$    |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.65^{+0.27}_{-0.26}$          | $D_{2000}$                           | $230.7^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | $0.661^{+0.011}_{-0.0098}$   |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $n_{\mathrm{s},0.002}$               | $0.971^{+0.042}_{-0.039}$       | $f\sigma_8(0.51)$           | $0.468^{+0.011}_{-0.011}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24541^{+0.00011}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.619^{+0.010}_{-0.0090}$   |
| $A^{\mathrm{kSZ}}$                         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24674^{+0.00011}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.464^{+0.011}_{-0.010}$    |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.40}_{-0.39}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.577^{+0.059}_{-0.053}$       | $\sigma_8(0.61)$            | $0.5889^{+0.0095}_{-0.0085}$ |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.35}_{-0.36}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.779^{+0.047}_{-0.046}$      | $f\sigma_8(2.33)$           | $0.2972^{+0.0047}_{-0.0042}$ |
| $A_{217}^{\mathrm{dust}}$                  | $0.98^{+0.21}_{-0.20}$          | $z_*$                                | $1089.69^{+0.52}_{-0.49}$       | $\sigma_8(2.33)$            | $0.3068^{+0.0049}_{-0.0044}$ |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.03^{+0.31}_{-0.32}$          | $r_*$                                | $144.90^{+0.61}_{-0.59}$        | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                                  | $0.9976^{+0.0021}_{-0.0021}$    | $100\theta_*$                        | $1.04125^{+0.00057}_{-0.00059}$ | $f_{2000}^{217}$            | $106.6^{+4.1}_{-4.2}$        |
| $c_{217}$                                  | $1.0011^{+0.0031}_{-0.0032}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.916^{+0.059}_{-0.055}$      | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $c_{TE}$                                   | $0.9968^{+0.0099}_{-0.0096}$    | $z_{\mathrm{drag}}$                  | $1059.91^{+0.67}_{-0.67}$       | $\chi_{\mathrm{simall}}^2$  | $397.1\ (\nu: 2.1)$          |
| $c_{EE}$                                   | $0.9922^{+0.0097}_{-0.0097}$    | $r_{\mathrm{drag}}$                  | $147.55^{+0.63}_{-0.61}$        | $\chi_{\mathrm{lowl}}^2$    | $22.7\ (\nu: 1.5)$           |
| $H_0$                                      | $68.1^{+1.1}_{-1.1}$            | $k_{\mathrm{D}}$                     | $0.14042^{+0.00072}_{-0.00073}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11516.9\ (\nu: 20.7)$       |
| $\Omega_{\Lambda}$                         | $0.696^{+0.014}_{-0.015}$       | $100\theta_{\mathrm{D}}$             | $0.16077^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{H073p45}}^2$ | $10.4\ (\nu: 2.4)$           |
| $\Omega_{\mathrm{m}}$                      | $0.304^{+0.015}_{-0.014}$       | $z_{\mathrm{eq}}$                    | $3357^{+57}_{-55}$              | $\chi_{\mathrm{prior}}^2$   | $7.8\ (\nu: 6.0)$            |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1411^{+0.0024}_{-0.0023}$    | $k_{\mathrm{eq}}$                    | $0.01025^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{CMB}}^2$     | $11936.7\ (\nu: 19.8)$       |
| $\Omega_{\mathrm{m}}h^3$                   | $0.09615^{+0.00065}_{-0.00066}$ | $100\theta_{\mathrm{eq}}$            | $0.822^{+0.011}_{-0.011}$       |                             |                              |
| $\sigma_8$                                 | $0.805^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4538^{+0.0055}_{-0.0056}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11954.85; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.84; R - 1 = 0.05101$$



# 11 nrun+r

## 11.1 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022137 | $0.02222^{+0.00048}_{-0.00046}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6117   | $0.608^{+0.023}_{-0.023}$       | $D_M(0.38)$                 | 1543.1   | $1537^{+31}_{-32}$           |
| $\Omega_c h^2$              | 0.12088  | $0.1202^{+0.0041}_{-0.0042}$    | $\sigma_8/h^{0.5}$          | 0.9937   | $0.988^{+0.032}_{-0.031}$       | $H(0.51)$                   | 89.31    | $89.49^{+0.93}_{-0.86}$      |
| $100\theta_{MC}$            | 1.04081  | $1.04089^{+0.00092}_{-0.00092}$ | $r_{drag}h$                 | 98.30    | $98.9^{+3.3}_{-3.1}$            | $D_M(0.51)$                 | 1997.4   | $1990^{+37}_{-37}$           |
| $\tau$                      | 0.0529   | $0.053^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.451    | $2.432^{+0.076}_{-0.077}$       | $H(0.61)$                   | 95.00    | $95.15^{+0.75}_{-0.69}$      |
| $\ln(10^{10} A_s)$          | 3.0421   | $3.042^{+0.036}_{-0.035}$       | $z_{re}$                    | 7.60     | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2322.9   | $2315^{+39}_{-40}$           |
| $n_s$                       | 0.9616   | $0.964^{+0.012}_{-0.012}$       | $10^9 A_s$                  | 2.095    | $2.095^{+0.076}_{-0.072}$       | $H(2.33)$                   | 236.90   | $236.5^{+2.5}_{-2.5}$        |
| $dn_s/d \ln k$              | -0.0039  | $-0.007^{+0.016}_{-0.017}$      | $10^9 A_s e^{-2\tau}$       | 1.8847   | $1.883^{+0.028}_{-0.028}$       | $D_M(2.33)$                 | 5777.0   | $5771^{+33}_{-34}$           |
| $r$                         | 0.000    | $< 0.158$                       | $D_{40}$                    | 1224.4   | $1232^{+45}_{-43}$              | $f\sigma_8(0.15)$           | 0.4645   | $0.460^{+0.024}_{-0.024}$    |
| $y_{cal}$                   | 1.00043  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                   | 5704     | $5701^{+82}_{-81}$              | $\sigma_8(0.15)$            | 0.7495   | $0.748^{+0.015}_{-0.015}$    |
| $A_{100}^{PS}$              | 247.5    | $246^{+50}_{-50}$               | $D_{810}$                   | 2534.8   | $2536^{+28}_{-28}$              | $f\sigma_8(0.38)$           | 0.4805   | $0.477^{+0.019}_{-0.019}$    |
| $A_{143}^{PS}$              | 39.7     | $43^{+20}_{-20}$                | $D_{1420}$                  | 812.8    | $814^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6633   | $0.662^{+0.012}_{-0.012}$    |
| $A_{217}^{PS}$              | 98.2     | $100^{+30}_{-30}$               | $D_{2000}$                  | 228.81   | $229.0^{+3.9}_{-3.9}$           | $f\sigma_8(0.51)$           | 0.4779   | $0.475^{+0.016}_{-0.016}$    |
| $A_{217}^{CIB}$             | 44.6     | $42^{+20}_{-10}$                | $n_{s,0.002}$               | 0.974    | $0.986^{+0.054}_{-0.050}$       | $\sigma_8(0.51)$            | 0.6203   | $0.619^{+0.011}_{-0.011}$    |
| $A_{143}^{tSZ}$             | 4.35     | $< 7.32$                        | $Y_P$                       | 0.245300 | $0.24533^{+0.00019}_{-0.00022}$ | $f\sigma_8(0.61)$           | 0.4721   | $0.470^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{PS}$   | 0.548    | $0.64^{+0.25}_{-0.24}$          | $Y_P^{BBN}$                 | 0.246626 | $0.24666^{+0.00019}_{-0.00022}$ | $\sigma_8(0.61)$            | 0.5899   | $0.589^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | 0.68     | —                               | $10^5 D/H$                  | 2.630    | $2.614^{+0.089}_{-0.088}$       | $f\sigma_8(2.33)$           | 0.2971   | $0.2969^{+0.0051}_{-0.0050}$ |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | Age/Gyr                     | 13.828   | $13.814^{+0.074}_{-0.076}$      | $\sigma_8(2.33)$            | 0.3058   | $0.3059^{+0.0054}_{-0.0053}$ |
| $A^{kSZ}$                   | 3.8      | —                               | $z_*$                       | 1090.30  | $1090.12^{+0.82}_{-0.83}$       | $r_{0.002}$                 | 0.000    | $< 0.162$                    |
| $A_{100}^{dust}$            | 1.019    | $1.01^{+0.39}_{-0.39}$          | $r_*$                       | 144.38   | $144.50^{+0.98}_{-0.94}$        | $r_{0.01}$                  | 0.000    | $< 0.157$                    |
| $A_{143}^{dust}$            | 0.984    | $0.98^{+0.34}_{-0.35}$          | $100\theta_*$               | 1.04101  | $1.04109^{+0.00091}_{-0.00091}$ | $\ln(10^{10} A_t)$          | -6.04    | $-0.3^{+1.9}_{-2.5}$         |
| $A_{217}^{dust}$            | 0.959    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/Gpc$              | 13.869   | $13.880^{+0.090}_{-0.088}$      | $r_{10}$                    | 0.0001   | $< 0.0856$                   |
| $A_{143 \times 217}^{dust}$ | 1.006    | $1.03^{+0.32}_{-0.32}$          | $z_{drag}$                  | 1059.47  | $1059.6^{+1.0}_{-1.0}$          | $10^9 A_t$                  | 0.000    | $< 0.331$                    |
| $c_{100}$                   | 0.99743  | $0.9975^{+0.0021}_{-0.0021}$    | $r_{drag}$                  | 147.12   | $147.2^{+1.0}_{-0.96}$          | $10^9 A_t e^{-2\tau}$       | 0.000    | $< 0.297$                    |
| $c_{217}$                   | 1.00143  | $1.0013^{+0.0031}_{-0.0031}$    | $k_D$                       | 0.14066  | $0.1406^{+0.0011}_{-0.0011}$    | $f_{2000}^{143}$            | 32.3     | $32^{+7}_{-7}$               |
| $H_0$                       | 66.82    | $67.2^{+1.9}_{-1.8}$            | $100\theta_D$               | 0.16104  | $0.16096^{+0.00058}_{-0.00057}$ | $f_{2000}^{217}$            | 108.47   | $108.2^{+4.3}_{-4.4}$        |
| $\Omega_\Lambda$            | 0.6782   | $0.683^{+0.025}_{-0.026}$       | $z_{eq}$                    | 3418     | $3403^{+93}_{-95}$              | $f_{2000}^{143 \times 217}$ | 33.88    | $34^{+5}_{-5}$               |
| $\Omega_m$                  | 0.3218   | $0.317^{+0.026}_{-0.025}$       | $k_{eq}$                    | 0.010431 | $0.01039^{+0.00028}_{-0.00029}$ | $\chi_{small}^2$            | 395.90   | $397.3 (\nu: 1.5)$           |
| $\Omega_m h^2$              | 0.14366  | $0.1430^{+0.0039}_{-0.0040}$    | $100\theta_{eq}$            | 0.8098   | $0.813^{+0.018}_{-0.017}$       | $\chi_{lowl}^2$             | 22.71    | $23.7 (\nu: 2.6)$            |
| $\Omega_m h^3$              | 0.09599  | $0.09606^{+0.00099}_{-0.00096}$ | $100\theta_{s,eq}$          | 0.4477   | $0.4493^{+0.0093}_{-0.0088}$    | $\chi_{CamSpec}^2$          | 7050.5   | $7065.1 (\nu: 16.5)$         |
| $\sigma_8$                  | 0.8122   | $0.810^{+0.018}_{-0.018}$       | $H(0.15)$                   | 72.21    | $72.5^{+1.6}_{-1.5}$            | $\chi_{prior}^2$            | 2.4      | $7.7 (\nu: 6.1)$             |
| $S_8$                       | 0.8412   | $0.833^{+0.048}_{-0.047}$       | $D_M(0.15)$                 | 648.1    | $645^{+16}_{-16}$               | $\chi_{CMB}^2$              | 7469.1   | $7486.1 (\nu: 17.1)$         |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4607   | $0.456^{+0.026}_{-0.026}$       | $H(0.38)$                   | 82.49    | $82.7^{+1.2}_{-1.1}$            |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 7471.53$ ;  $\Delta\chi_{eff}^2 = -0.20$ ;  $\bar{\chi}_{eff}^2 = 7493.80$ ;  $\Delta\bar{\chi}_{eff}^2 = 2.26$ ;  $R - 1 = 0.00512$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.90 ( $\Delta$  0.07) commander\_dx12\_v3.2.29: 22.71 ( $\Delta$  -0.68) CamSpec like\_10.7HM: 7050.49 ( $\Delta$  0.15)



## 11.2 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                                  | 95% limits                      | Parameter                          | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                  | $0.02230^{+0.00044}_{-0.00043}$ | $\sigma_8/h^{0.5}$                 | $0.979^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(0.51)$           | $1979^{+22}_{-22}$           |
| $\Omega_{\mathrm{c}} h^2$                  | $0.1189^{+0.0024}_{-0.0024}$    | $r_{\mathrm{drag}} h$              | $99.9^{+1.9}_{-1.8}$            | $H(0.61)$                        | $95.35^{+0.52}_{-0.49}$      |
| $100\theta_{\mathrm{MC}}$                  | $1.04106^{+0.00081}_{-0.00079}$ | $\langle d^2 \rangle^{1/2}$        | $2.412^{+0.057}_{-0.059}$       | $D_{\mathrm{M}}(0.61)$           | $2303^{+24}_{-24}$           |
| $\tau$                                     | $0.055^{+0.017}_{-0.016}$       | $z_{\mathrm{re}}$                  | $7.7^{+1.6}_{-1.6}$             | $H(2.33)$                        | $235.7^{+1.6}_{-1.6}$        |
| $\ln(10^{10} A_{\mathrm{s}})$              | $3.042^{+0.036}_{-0.034}$       | $10^9 A_{\mathrm{s}}$              | $2.094^{+0.076}_{-0.071}$       | $D_{\mathrm{M}}(2.33)$           | $5762^{+25}_{-25}$           |
| $n_{\mathrm{s}}$                           | $0.9673^{+0.0091}_{-0.0089}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.877^{+0.024}_{-0.024}$       | $f\sigma_8(0.15)$                | $0.453^{+0.015}_{-0.015}$    |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.006^{+0.016}_{-0.017}$      | $D_{40}$                           | $1228^{+45}_{-42}$              | $\sigma_8(0.15)$                 | $0.745^{+0.013}_{-0.013}$    |
| $r$  | $< 0.169$                       | $D_{220}$                          | $5707^{+81}_{-80}$              | $f\sigma_8(0.38)$                | $0.472^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                         | $1.0005^{+0.0049}_{-0.0049}$    | $D_{810}$                          | $2535^{+27}_{-28}$              | $\sigma_8(0.38)$                 | $0.661^{+0.012}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                    | $245^{+50}_{-50}$               | $D_{1420}$                         | $814^{+10}_{-10}$               | $f\sigma_8(0.51)$                | $0.471^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                    | $42^{+20}_{-20}$                | $D_{2000}$                         | $229.3^{+3.8}_{-3.8}$           | $\sigma_8(0.51)$                 | $0.619^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                    | $100^{+30}_{-30}$               | $n_{\mathrm{s},0.002}$             | $0.988^{+0.055}_{-0.050}$       | $f\sigma_8(0.61)$                | $0.466^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                   | $42^{+10}_{-10}$                | $Y_{\mathrm{P}}$                   | $0.24536^{+0.00017}_{-0.00019}$ | $\sigma_8(0.61)$                 | $0.589^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.37$                        | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24669^{+0.00017}_{-0.00019}$ | $f\sigma_8(2.33)$                | $0.2969^{+0.0052}_{-0.0050}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.64^{+0.25}_{-0.24}$          | $10^5 \mathrm{D}/\mathrm{H}$       | $2.600^{+0.081}_{-0.079}$       | $\sigma_8(2.33)$                 | $0.3062^{+0.0053}_{-0.0052}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | Age/Gyr                            | $13.796^{+0.057}_{-0.059}$      | $r_{0.002}$                      | $< 0.175$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $z_*$                              | $1089.91^{+0.62}_{-0.61}$       | $r_{0.01}$                       | $< 0.169$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $r_*$                              | $144.78^{+0.66}_{-0.65}$        | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.2^{+1.9}_{-2.5}$         |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.39}_{-0.39}$          | $100\theta_*$                      | $1.04125^{+0.00080}_{-0.00078}$ | $r_{10}$                         | $< 0.0923$                   |
| $A_{143}^{\mathrm{dust}}$                  | $0.98^{+0.34}_{-0.35}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.905^{+0.064}_{-0.064}$      | $10^9 A_{\mathrm{t}}$            | $< 0.355$                    |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $z_{\mathrm{drag}}$                | $1059.7^{+1.0}_{-0.97}$         | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.316$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.31}$          | $r_{\mathrm{drag}}$                | $147.48^{+0.74}_{-0.73}$        | $f_{2000}^{143}$                 | $31^{+7}_{-7}$               |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{D}}$                   | $0.14040^{+0.00099}_{-0.00098}$ | $f_{2000}^{217}$                 | $108.0^{+4.2}_{-4.3}$        |
| $c_{217}$                                  | $1.0013^{+0.0031}_{-0.0031}$    | $100\theta_{\mathrm{D}}$           | $0.16092^{+0.00059}_{-0.00057}$ | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $H_0$                                      | $67.7^{+1.1}_{-1.1}$            | $z_{\mathrm{eq}}$                  | $3373^{+57}_{-57}$              | $\chi_{\mathrm{simall}}^2$       | $397.4 (\nu: 1.6)$           |
| $\Omega_{\Lambda}$                         | $0.691^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                  | $0.01030^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{lowl}}^2$         | $23.3 (\nu: 2.2)$            |
| $\Omega_{\mathrm{m}}$                      | $0.309^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{eq}}$          | $0.818^{+0.011}_{-0.010}$       | $\chi_{\mathrm{CamSpec}}^2$      | $7065.3 (\nu: 15.8)$         |
| $\Omega_{\mathrm{m}} h^2$                  | $0.1418^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{s,eq}}$        | $0.4521^{+0.0055}_{-0.0054}$    | $\chi_{6\mathrm{DF}}^2$          | $0.052 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^3$                  | $0.09606^{+0.00099}_{-0.00096}$ | $H(0.15)$                          | $73.00^{+0.95}_{-0.92}$         | $\chi_{\mathrm{MGS}}^2$          | $1.43 (\nu: 0.1)$            |
| $\sigma_8$                                 | $0.806^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$             | $640.2^{+9.1}_{-9.2}$           | $\chi_{\mathrm{DR12BAO}}^2$      | $4.6 (\nu: 1.1)$             |
| $S_8$                                      | $0.818^{+0.029}_{-0.029}$       | $H(0.38)$                          | $83.06^{+0.72}_{-0.69}$         | $\chi_{\mathrm{prior}}^2$        | $7.8 (\nu: 6.1)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$       | $0.448^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$             | $1527^{+18}_{-19}$              | $\chi_{\mathrm{BAO}}^2$          | $6.1 (\nu: 0.7)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$      | $0.601^{+0.016}_{-0.016}$       | $H(0.51)$                          | $89.75^{+0.60}_{-0.57}$         | $\chi_{\mathrm{CMB}}^2$          | $7486.0 (\nu: 16.4)$         |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7499.85; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 2.30; R - 1 = 0.00974$$



### 11.3 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02223^{+0.00048}_{-0.00046}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.38)$           | $1537^{+31}_{-32}$           |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1201^{+0.0041}_{-0.0041}$    | $\sigma_8/h^{0.5}$                    | $0.989^{+0.032}_{-0.031}$       | $H(0.51)$                        | $89.51^{+0.93}_{-0.85}$      |
| $100\theta_{\mathrm{MC}}$                   | $1.04090^{+0.00092}_{-0.00091}$ | $r_{\mathrm{drag}} h$                 | $98.9^{+3.3}_{-3.1}$            | $D_{\mathrm{M}}(0.51)$           | $1990^{+36}_{-37}$           |
| $\tau$                                      | $0.055^{+0.014}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$           | $2.433^{+0.076}_{-0.076}$       | $H(0.61)$                        | $95.17^{+0.75}_{-0.68}$      |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.045^{+0.031}_{-0.029}$       | $z_{\mathrm{re}}$                     | $< 9.03$                        | $D_{\mathrm{M}}(0.61)$           | $2314^{+39}_{-40}$           |
| $n_{\mathrm{s}}$                            | $0.964^{+0.012}_{-0.011}$       | $10^9 A_{\mathrm{s}}$                 | $2.102^{+0.066}_{-0.060}$       | $H(2.33)$                        | $236.5^{+2.5}_{-2.5}$        |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.007^{+0.016}_{-0.017}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.882^{+0.028}_{-0.028}$       | $D_{\mathrm{M}}(2.33)$           | $5770^{+32}_{-34}$           |
| $r$   | $< 0.159$                       | $D_{40}$                              | $1231^{+46}_{-43}$              | $f\sigma_8(0.15)$                | $0.460^{+0.024}_{-0.024}$    |
| $y_{\mathrm{cal}}$                          | $1.0005^{+0.0050}_{-0.0049}$    | $D_{220}$                             | $5702^{+82}_{-81}$              | $\sigma_8(0.15)$                 | $0.749^{+0.014}_{-0.014}$    |
| $A_{100}^{\mathrm{PS}}$                     | $245^{+50}_{-50}$               | $D_{810}$                             | $2536^{+28}_{-28}$              | $f\sigma_8(0.38)$                | $0.478^{+0.019}_{-0.019}$    |
| $A_{143}^{\mathrm{PS}}$                     | $42^{+20}_{-20}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.38)$                 | $0.663^{+0.012}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                     | $100^{+30}_{-30}$               | $D_{2000}$                            | $229.1^{+3.8}_{-3.8}$           | $f\sigma_8(0.51)$                | $0.476^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                    | $42^{+20}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.987^{+0.054}_{-0.050}$       | $\sigma_8(0.51)$                 | $0.620^{+0.011}_{-0.0093}$   |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.32$                        | $Y_{\mathrm{P}}$                      | $0.24534^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.61)$                | $0.470^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.64^{+0.25}_{-0.24}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24666^{+0.00019}_{-0.00021}$ | $\sigma_8(0.61)$                 | $0.5901^{+0.0093}_{-0.0089}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.612^{+0.088}_{-0.087}$       | $f\sigma_8(2.33)$                | $0.2973^{+0.0045}_{-0.0043}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.812^{+0.073}_{-0.076}$      | $\sigma_8(2.33)$                 | $0.3063^{+0.0047}_{-0.0044}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | $z_*$                                 | $1090.11^{+0.81}_{-0.82}$       | $r_{0.002}$                      | $< 0.163$                    |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.39}_{-0.39}$          | $r_*$                                 | $144.51^{+0.97}_{-0.94}$        | $r_{0.01}$                       | $< 0.158$                    |
| $A_{143}^{\mathrm{dust}}$                   | $0.98^{+0.34}_{-0.35}$          | $100\theta_*$                         | $1.04109^{+0.00091}_{-0.00090}$ | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.3^{+1.9}_{-2.5}$         |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.881^{+0.090}_{-0.088}$      | $r_{10}$                         | $< 0.0865$                   |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.32}$          | $z_{\mathrm{drag}}$                   | $1059.62^{+0.99}_{-0.99}$       | $10^9 A_{\mathrm{t}}$            | $< 0.335$                    |
| $c_{100}$                                   | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                   | $147.2^{+1.0}_{-0.97}$          | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.300$                    |
| $c_{217}$                                   | $1.0013^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.1406^{+0.0011}_{-0.0011}$    | $f_{2000}^{143}$                 | $32^{+7}_{-7}$               |
| $H_0$                                       | $67.2^{+1.9}_{-1.8}$            | $100\theta_{\mathrm{D}}$              | $0.16095^{+0.00058}_{-0.00057}$ | $f_{2000}^{217}$                 | $108.1^{+4.3}_{-4.4}$        |
| $\Omega_{\Lambda}$                          | $0.683^{+0.025}_{-0.026}$       | $z_{\mathrm{eq}}$                     | $3401^{+93}_{-94}$              | $f_{2000}^{143 \times 217}$      | $34^{+5}_{-5}$               |
| $\Omega_{\mathrm{m}}$                       | $0.317^{+0.026}_{-0.025}$       | $k_{\mathrm{eq}}$                     | $0.01038^{+0.00028}_{-0.00029}$ | $\chi_{\mathrm{simall}}^2$       | $397.2 (\nu: 1.5)$           |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1430^{+0.0039}_{-0.0040}$    | $100\theta_{\mathrm{eq}}$             | $0.813^{+0.018}_{-0.017}$       | $\chi_{\mathrm{lowl}}^2$         | $23.6 (\nu: 2.5)$            |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09607^{+0.00099}_{-0.00096}$ | $100\theta_{\mathrm{s,eq}}$           | $0.4494^{+0.0093}_{-0.0088}$    | $\chi_{\mathrm{CamSpec}}^2$      | $7065.0 (\nu: 16.4)$         |
| $\sigma_8$                                  | $0.811^{+0.017}_{-0.017}$       | $H(0.15)$                             | $72.5^{+1.6}_{-1.5}$            | $\chi_{\mathrm{prior}}^2$        | $7.7 (\nu: 6.1)$             |
| $S_8$                                       | $0.833^{+0.048}_{-0.047}$       | $D_{\mathrm{M}}(0.15)$                | $645^{+16}_{-16}$               | $\chi_{\mathrm{CMB}}^2$          | $7485.8 (\nu: 16.8)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$        | $0.456^{+0.026}_{-0.026}$       | $H(0.38)$                             | $82.7^{+1.2}_{-1.1}$            |                                  |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7493.58; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 2.32; R - 1 = 0.00549$$



#### 11.4 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                          | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                  | $0.02230^{+0.00044}_{-0.00043}$ | $\sigma_8/h^{0.5}$                 | $0.980^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(0.51)$           | $1979^{+22}_{-22}$           |
| $\Omega_{\mathrm{c}} h^2$                  | $0.1188^{+0.0024}_{-0.0024}$    | $r_{\mathrm{drag}} h$              | $99.9^{+1.9}_{-1.8}$            | $H(0.61)$                        | $95.36^{+0.51}_{-0.49}$      |
| $100\theta_{\mathrm{MC}}$                  | $1.04106^{+0.00081}_{-0.00080}$ | $\langle d^2 \rangle^{1/2}$        | $2.414^{+0.056}_{-0.056}$       | $D_{\mathrm{M}}(0.61)$           | $2303^{+23}_{-24}$           |
| $\tau$                                     | $0.056^{+0.014}_{-0.013}$       | $z_{\mathrm{re}}$                  | $< 9.10$                        | $H(2.33)$                        | $235.7^{+1.6}_{-1.6}$        |
| $\ln(10^{10} A_{\mathrm{s}})$              | $3.044^{+0.032}_{-0.029}$       | $10^9 A_{\mathrm{s}}$              | $2.099^{+0.067}_{-0.061}$       | $D_{\mathrm{M}}(2.33)$           | $5762^{+25}_{-25}$           |
| $n_{\mathrm{s}}$                           | $0.9673^{+0.0091}_{-0.0089}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.877^{+0.024}_{-0.024}$       | $f\sigma_8(0.15)$                | $0.453^{+0.015}_{-0.015}$    |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.007^{+0.016}_{-0.018}$      | $D_{40}$                           | $1227^{+45}_{-42}$              | $\sigma_8(0.15)$                 | $0.746^{+0.013}_{-0.012}$    |
| $r$  | $< 0.169$                       | $D_{220}$                          | $5706^{+82}_{-80}$              | $f\sigma_8(0.38)$                | $0.472^{+0.013}_{-0.012}$    |
| $y_{\mathrm{cal}}$                         | $1.0005^{+0.0049}_{-0.0049}$    | $D_{810}$                          | $2535^{+28}_{-28}$              | $\sigma_8(0.38)$                 | $0.662^{+0.011}_{-0.0097}$   |
| $A_{100}^{\mathrm{PS}}$                    | $245^{+50}_{-50}$               | $D_{1420}$                         | $814^{+10}_{-10}$               | $f\sigma_8(0.51)$                | $0.471^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                    | $42^{+20}_{-20}$                | $D_{2000}$                         | $229.3^{+3.8}_{-3.8}$           | $\sigma_8(0.51)$                 | $0.6192^{+0.0098}_{-0.0093}$ |
| $A_{217}^{\mathrm{PS}}$                    | $100^{+30}_{-30}$               | $n_{\mathrm{s},0.002}$             | $0.989^{+0.054}_{-0.050}$       | $f\sigma_8(0.61)$                | $0.466^{+0.010}_{-0.010}$    |
| $A_{217}^{\mathrm{CIB}}$                   | $42^{+10}_{-10}$                | $Y_{\mathrm{P}}$                   | $0.24536^{+0.00017}_{-0.00019}$ | $\sigma_8(0.61)$                 | $0.5893^{+0.0093}_{-0.0088}$ |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.38$                        | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24669^{+0.00017}_{-0.00019}$ | $f\sigma_8(2.33)$                | $0.2972^{+0.0046}_{-0.0043}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.64^{+0.25}_{-0.24}$          | $10^5 \mathrm{D}/\mathrm{H}$       | $2.599^{+0.082}_{-0.079}$       | $\sigma_8(2.33)$                 | $0.3065^{+0.0048}_{-0.0045}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | Age/Gyr                            | $13.795^{+0.057}_{-0.059}$      | $r_{0.002}$                      | $< 0.176$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $z_*$                              | $1089.91^{+0.62}_{-0.61}$       | $r_{0.01}$                       | $< 0.169$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $r_*$                              | $144.78^{+0.66}_{-0.65}$        | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.2^{+1.9}_{-2.5}$         |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.39}_{-0.38}$          | $100\theta_*$                      | $1.04125^{+0.00080}_{-0.00078}$ | $r_{10}$                         | $< 0.0926$                   |
| $A_{143}^{\mathrm{dust}}$                  | $0.98^{+0.34}_{-0.35}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.905^{+0.064}_{-0.064}$      | $10^9 A_{\mathrm{t}}$            | $< 0.355$                    |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $z_{\mathrm{drag}}$                | $1059.7^{+1.0}_{-0.98}$         | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.318$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.31}$          | $r_{\mathrm{drag}}$                | $147.48^{+0.74}_{-0.72}$        | $f_{2000}^{143}$                 | $31^{+7}_{-7}$               |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{D}}$                   | $0.14041^{+0.00099}_{-0.00098}$ | $f_{2000}^{217}$                 | $107.9^{+4.3}_{-4.3}$        |
| $c_{217}$                                  | $1.0013^{+0.0031}_{-0.0031}$    | $100\theta_{\mathrm{D}}$           | $0.16091^{+0.00059}_{-0.00056}$ | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $H_0$                                      | $67.8^{+1.1}_{-1.1}$            | $z_{\mathrm{eq}}$                  | $3373^{+57}_{-57}$              | $\chi_{\mathrm{simall}}^2$       | $397.3 (\nu: 1.6)$           |
| $\Omega_{\Lambda}$                         | $0.691^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                  | $0.01029^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{lowl}}^2$         | $23.3 (\nu: 2.2)$            |
| $\Omega_{\mathrm{m}}$                      | $0.309^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{eq}}$          | $0.819^{+0.010}_{-0.010}$       | $\chi_{\mathrm{CamSpec}}^2$      | $7065.3 (\nu: 15.8)$         |
| $\Omega_{\mathrm{m}} h^2$                  | $0.1418^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{s,eq}}$        | $0.4522^{+0.0055}_{-0.0054}$    | $\chi_{6\mathrm{DF}}^2$          | $0.051 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^3$                  | $0.09606^{+0.00099}_{-0.00097}$ | $H(0.15)$                          | $73.01^{+0.95}_{-0.92}$         | $\chi_{\mathrm{MGS}}^2$          | $1.44 (\nu: 0.1)$            |
| $\sigma_8$                                 | $0.807^{+0.015}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$             | $640.1^{+9.1}_{-9.2}$           | $\chi_{\mathrm{DR12BAO}}^2$      | $4.6 (\nu: 1.1)$             |
| $S_8$                                      | $0.819^{+0.029}_{-0.028}$       | $H(0.38)$                          | $83.07^{+0.72}_{-0.69}$         | $\chi_{\mathrm{prior}}^2$        | $7.7 (\nu: 6.1)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$       | $0.449^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$             | $1527^{+18}_{-19}$              | $\chi_{\mathrm{BAO}}^2$          | $6.1 (\nu: 0.7)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$      | $0.602^{+0.015}_{-0.015}$       | $H(0.51)$                          | $89.76^{+0.60}_{-0.57}$         | $\chi_{\mathrm{CMB}}^2$          | $7485.8 (\nu: 16.1)$         |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7499.67; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 2.35; R - 1 = 0.00851$$



# 11.5 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022298 | $0.02234^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4534   | $0.453^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | 1533.3   | $1532^{+19}_{-19}$           |
| $\Omega_c h^2$              | 0.11968  | $0.1195^{+0.0025}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6056   | $0.605^{+0.013}_{-0.013}$       | $H(0.51)$                   | 89.59    | $89.65^{+0.57}_{-0.55}$      |
| $100\theta_{MC}$            | 1.04085  | $1.04088^{+0.00062}_{-0.00062}$ | $\sigma_8/h^{0.5}$          | 0.9855   | $0.985^{+0.018}_{-0.018}$       | $D_M(0.51)$                 | 1985.9   | $1984^{+22}_{-22}$           |
| $\tau$                      | 0.0534   | $0.055^{+0.016}_{-0.015}$       | $r_{drag}h$                 | 99.23    | $99.4^{+1.9}_{-1.9}$            | $H(0.61)$                   | 95.231   | $95.28^{+0.46}_{-0.45}$      |
| $\ln(10^{10} A_s)$          | 3.0405   | $3.044^{+0.032}_{-0.030}$       | $\langle d^2 \rangle^{1/2}$ | 2.4347   | $2.425^{+0.048}_{-0.048}$       | $D_M(0.61)$                 | 2310.5   | $2308^{+24}_{-24}$           |
| $n_s$                       | 0.9659   | $0.9663^{+0.0090}_{-0.0091}$    | $z_{re}$                    | 7.60     | $7.7^{+1.5}_{-1.6}$             | $H(2.33)$                   | 236.27   | $236.2^{+1.5}_{-1.5}$        |
| $dn_s/d \ln k$              | -0.0008  | $-0.005^{+0.014}_{-0.015}$      | $10^9 A_s$                  | 2.092    | $2.099^{+0.068}_{-0.062}$       | $D_M(2.33)$                 | 5766.9   | $5764^{+21}_{-22}$           |
| $r$                         | 0.020    | $< 0.180$                       | $10^9 A_s e^{-2\tau}$       | 1.8798   | $1.881^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$           | 0.4578   | $0.457^{+0.013}_{-0.013}$    |
| $y_{cal}$                   | 1.00052  | $1.0006^{+0.0048}_{-0.0050}$    | $D_{40}$                    | 1231.4   | $1239^{+43}_{-40}$              | $\sigma_8(0.15)$            | 0.7473   | $0.747^{+0.011}_{-0.011}$    |
| $A_{100}^{PS}$              | 235.5    | $242^{+50}_{-50}$               | $D_{220}$                   | 5718     | $5714^{+78}_{-78}$              | $f\sigma_8(0.38)$           | 0.4755   | $0.475^{+0.010}_{-0.010}$    |
| $A_{143}^{PS}$              | 39.5     | $41^{+20}_{-20}$                | $D_{810}$                   | 2536.2   | $2537^{+27}_{-27}$              | $\sigma_8(0.38)$            | 0.6621   | $0.6623^{+0.0097}_{-0.0093}$ |
| $A_{217}^{PS}$              | 101.9    | $102^{+30}_{-30}$               | $D_{1420}$                  | 816.0    | $815^{+10}_{-10}$               | $f\sigma_8(0.51)$           | 0.4738   | $0.4733^{+0.0090}_{-0.0092}$ |
| $A_{217}^{CIB}$             | 44.6     | $40^{+10}_{-10}$                | $D_{2000}$                  | 230.28   | $229.9^{+3.7}_{-3.7}$           | $\sigma_8(0.51)$            | 0.6195   | $0.6197^{+0.0092}_{-0.0087}$ |
| $A_{143}^{tSZ}$             | 6.54     | $< 7.39$                        | $n_{s,0.002}$               | 0.9685   | $0.984^{+0.049}_{-0.045}$       | $f\sigma_8(0.61)$           | 0.4686   | $0.4683^{+0.0083}_{-0.0084}$ |
| $r_{143 \times 217}^{PS}$   | 0.586    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.245367 | $0.24538^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | 0.5894   | $0.5896^{+0.0088}_{-0.0084}$ |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $Y_P^{BBN}$                 | 0.246693 | $0.24671^{+0.00012}_{-0.00014}$ | $f\sigma_8(2.33)$           | 0.29708  | $0.2972^{+0.0046}_{-0.0044}$ |
| $\xi^{tSZ \times CIB}$      | 0.07     | —                               | $10^5 D/H$                  | 2.599    | $2.593^{+0.062}_{-0.058}$       | $\sigma_8(2.33)$            | 0.30616  | $0.3064^{+0.0050}_{-0.0048}$ |
| $A^{kSZ}$                   | 0.0      | —                               | Age/Gyr                     | 13.8054  | $13.800^{+0.048}_{-0.048}$      | $r_{0.002}$                 | 0.018    | $< 0.186$                    |
| $A_{100}^{dust}$            | 1.009    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1089.98  | $1089.92^{+0.55}_{-0.54}$       | $r_{0.01}$                  | 0.019    | $< 0.180$                    |
| $A_{143}^{dust}$            | 0.969    | $0.96^{+0.35}_{-0.35}$          | $r_*$                       | 144.57   | $144.58^{+0.55}_{-0.56}$        | $\ln(10^{10} A_t)$          | -0.86    | $0.1^{+1.6}_{-2.2}$          |
| $A_{217}^{dust}$            | 0.969    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04104  | $1.04107^{+0.00062}_{-0.00061}$ | $r_{10}$                    | 0.0094   | $< 0.0975$                   |
| $A_{143 \times 217}^{dust}$ | 1.003    | $1.02^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | 13.887   | $13.888^{+0.052}_{-0.053}$      | $10^9 A_t$                  | 0.042    | $< 0.380$                    |
| $c_{100}$                   | 0.99769  | $0.9975^{+0.0020}_{-0.0021}$    | $z_{drag}$                  | 1059.74  | $1059.82^{+0.68}_{-0.69}$       | $10^9 A_t e^{-2\tau}$       | 0.038    | $< 0.339$                    |
| $c_{217}$                   | 1.00132  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | 147.26   | $147.26^{+0.57}_{-0.57}$        | $f_{2000}^{143}$            | 30.1     | $30^{+7}_{-6}$               |
| $c_{TE}$                    | 0.9966   | $0.9963^{+0.0098}_{-0.0096}$    | $k_D$                       | 0.14064  | $0.14066^{+0.00067}_{-0.00069}$ | $f_{2000}^{217}$            | 106.89   | $107.4^{+4.3}_{-4.2}$        |
| $c_{EE}$                    | 0.9922   | $0.9921^{+0.0097}_{-0.0097}$    | $100\theta_D$               | 0.160856 | $0.16082^{+0.00040}_{-0.00039}$ | $f_{2000}^{143 \times 217}$ | 32.12    | $33^{+5}_{-5}$               |
| $H_0$                       | 67.38    | $67.5^{+1.1}_{-1.1}$            | $z_{eq}$                    | 3393     | $3390^{+56}_{-55}$              | $\chi^2_{lensing}$          | 8.89     | $9.56 (\nu: 0.3)$            |
| $\Omega_\Lambda$            | 0.6859   | $0.687^{+0.015}_{-0.015}$       | $k_{eq}$                    | 0.010355 | $0.01035^{+0.00017}_{-0.00017}$ | $\chi^2_{small}$            | 396.00   | $397.4 (\nu: 1.5)$           |
| $\Omega_m$                  | 0.3141   | $0.313^{+0.015}_{-0.015}$       | $100\theta_{eq}$            | 0.8147   | $0.815^{+0.010}_{-0.010}$       | $\chi^2_{lowl}$             | 23.48    | $24.3 (\nu: 2.5)$            |
| $\Omega_m h^2$              | 0.14263  | $0.1425^{+0.0023}_{-0.0023}$    | $100\theta_{s,eq}$          | 0.4502   | $0.4505^{+0.0054}_{-0.0053}$    | $\chi^2_{CamSpec}$          | 11499.1  | $11514.1 (\nu: 16.9)$        |
| $\Omega_m h^3$              | 0.09611  | $0.09616^{+0.00064}_{-0.00066}$ | $H(0.15)$                   | 72.69    | $72.78^{+0.95}_{-0.94}$         | $\chi^2_{prior}$            | 2.1      | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                  | 0.8090   | $0.809^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | 643.2    | $642.3^{+9.5}_{-9.4}$           | $\chi^2_{CMB}$              | 11927.5  | $11945.3 (\nu: 18.1)$        |
| $S_8$                       | 0.8278   | $0.826^{+0.026}_{-0.025}$       | $H(0.38)$                   | 82.85    | $82.92^{+0.70}_{-0.69}$         |                             |          |                              |

Best-fit  $\chi^2_{eff} = 11929.59$ ;  $\Delta\chi^2_{eff} = -0.06$ ;  $\bar{\chi}^2_{eff} = 11953.15$ ;  $\Delta\bar{\chi}^2_{eff} = 1.71$ ;  $R - 1 = 0.01351$   
 $\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp.p\_teb\_consect8: 8.89 ( $\Delta$  0.06) simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.00 ( $\Delta$  0.13) commander\_dx12\_v3.2.29: 23.48 ( $\Delta$  0.26) CamSpec like\_10.7HM\_1400\_unified: 11499.08 ( $\Delta$  -0.58)



## 11.6 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO

| Parameter                                  | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                  | $0.02237^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.51)$           | $1979^{+17}_{-17}$           |
| $\Omega_{\mathrm{c}} h^2$                  | $0.1190^{+0.0019}_{-0.0019}$    | $\sigma_8/h^{0.5}$                    | $0.982^{+0.017}_{-0.016}$       | $H(0.61)$                        | $95.37^{+0.39}_{-0.37}$      |
| $100\theta_{\mathrm{MC}}$                  | $1.04095^{+0.00060}_{-0.00059}$ | $r_{\mathrm{drag}} h$                 | $99.8^{+1.5}_{-1.4}$            | $D_{\mathrm{M}}(0.61)$           | $2303^{+18}_{-19}$           |
| $\tau$                                     | $0.056^{+0.016}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$           | $2.419^{+0.045}_{-0.045}$       | $H(2.33)$                        | $235.9^{+1.2}_{-1.2}$        |
| $\ln(10^{10} A_{\mathrm{s}})$              | $3.046^{+0.032}_{-0.029}$       | $z_{\mathrm{re}}$                     | $7.9^{+1.5}_{-1.5}$             | $D_{\mathrm{M}}(2.33)$           | $5761^{+18}_{-19}$           |
| $n_{\mathrm{s}}$                           | $0.9676^{+0.0081}_{-0.0082}$    | $10^9 A_{\mathrm{s}}$                 | $2.104^{+0.068}_{-0.061}$       | $f\sigma_8(0.15)$                | $0.454^{+0.011}_{-0.011}$    |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.005^{+0.014}_{-0.016}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.021}_{-0.022}$       | $\sigma_8(0.15)$                 | $0.747^{+0.011}_{-0.011}$    |
| $r$  | $< 0.184$                       | $D_{40}$                              | $1238^{+44}_{-39}$              | $f\sigma_8(0.38)$                | $0.4731^{+0.0093}_{-0.0090}$ |
| $y_{\mathrm{cal}}$                         | $1.0008^{+0.0048}_{-0.0049}$    | $D_{220}$                             | $5718^{+77}_{-79}$              | $\sigma_8(0.38)$                 | $0.6624^{+0.0099}_{-0.0093}$ |
| $A_{100}^{\mathrm{PS}}$                    | $241^{+50}_{-50}$               | $D_{810}$                             | $2538^{+26}_{-27}$              | $f\sigma_8(0.51)$                | $0.4719^{+0.0084}_{-0.0081}$ |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $D_{1420}$                            | $816.1^{+9.9}_{-9.9}$           | $\sigma_8(0.51)$                 | $0.6200^{+0.0093}_{-0.0088}$ |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $D_{2000}$                            | $230.1^{+3.7}_{-3.6}$           | $f\sigma_8(0.61)$                | $0.4671^{+0.0078}_{-0.0077}$ |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.985^{+0.050}_{-0.045}$       | $\sigma_8(0.61)$                 | $0.5900^{+0.0089}_{-0.0084}$ |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.39$                        | $Y_{\mathrm{P}}$                      | $0.24539^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$                | $0.2976^{+0.0046}_{-0.0043}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.66^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24672^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$                 | $0.3069^{+0.0049}_{-0.0046}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.586^{+0.056}_{-0.054}$       | $r_{0.002}$                      | $< 0.190$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.792^{+0.042}_{-0.042}$      | $r_{0.01}$                       | $< 0.184$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $z_{*}$                               | $1089.83^{+0.46}_{-0.46}$       | $\ln(10^{10} A_{\mathrm{t}})$    | $0.1^{+1.6}_{-2.2}$          |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $r_{*}$                               | $144.70^{+0.45}_{-0.46}$        | $r_{10}$                         | $< 0.0999$                   |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.34}_{-0.34}$          | $100\theta_{*}$                       | $1.04114^{+0.00059}_{-0.00058}$ | $10^9 A_{\mathrm{t}}$            | $< 0.389$                    |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.898^{+0.044}_{-0.044}$      | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.346$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.87^{+0.67}_{-0.66}$       | $f_{2000}^{143}$                 | $30^{+7}_{-6}$               |
| $c_{100}$                                  | $0.9976^{+0.0020}_{-0.0020}$    | $r_{\mathrm{drag}}$                   | $147.36^{+0.49}_{-0.49}$        | $f_{2000}^{217}$                 | $107.3^{+4.3}_{-4.3}$        |
| $c_{217}$                                  | $1.0012^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.14058^{+0.00063}_{-0.00064}$ | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $c_{TE}$                                   | $0.9964^{+0.0098}_{-0.0098}$    | $100\theta_{\mathrm{D}}$              | $0.16079^{+0.00039}_{-0.00038}$ | $\chi_{\mathrm{lensing}}^2$      | $9.56 (\nu: 0.3)$            |
| $c_{EE}$                                   | $0.9923^{+0.0097}_{-0.0098}$    | $z_{\mathrm{eq}}$                     | $3378^{+43}_{-43}$              | $\chi_{\mathrm{simall}}^2$       | $397.6 (\nu: 1.8)$           |
| $H_0$                                      | $67.73^{+0.86}_{-0.84}$         | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{lowl}}^2$         | $24.1 (\nu: 2.4)$            |
| $\Omega_{\Lambda}$                         | $0.690^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{eq}}$             | $0.8178^{+0.0081}_{-0.0080}$    | $\chi_{\mathrm{CamSpec}}^2$      | $11514.0 (\nu: 16.5)$        |
| $\Omega_{\mathrm{m}}$                      | $0.310^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4517^{+0.0042}_{-0.0041}$    | $\chi_{6\mathrm{DF}}^2$          | $0.042 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                  | $0.1420^{+0.0018}_{-0.0018}$    | $H(0.15)$                             | $72.99^{+0.74}_{-0.72}$         | $\chi_{\mathrm{MGS}}^2$          | $1.36 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                  | $0.09617^{+0.00064}_{-0.00065}$ | $D_{\mathrm{M}}(0.15)$                | $640.2^{+7.2}_{-7.3}$           | $\chi_{\mathrm{DR12BAO}}^2$      | $4.5 (\nu: 0.7)$             |
| $\sigma_8$                                 | $0.808^{+0.012}_{-0.012}$       | $H(0.38)$                             | $83.07^{+0.55}_{-0.54}$         | $\chi_{\mathrm{prior}}^2$        | $7.9 (\nu: 5.9)$             |
| $S_8$                                      | $0.821^{+0.021}_{-0.020}$       | $D_{\mathrm{M}}(0.38)$                | $1527^{+14}_{-15}$              | $\chi_{\mathrm{CMB}}^2$          | $11945.2 (\nu: 17.4)$        |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$       | $0.450^{+0.012}_{-0.011}$       | $H(0.51)$                             | $89.77^{+0.46}_{-0.44}$         | $\chi_{\mathrm{BAO}}^2$          | $5.93 (\nu: 0.4)$            |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.98; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.58; R - 1 = 0.01470$$



## 11.7 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                                   | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|---|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                   | $0.02234^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.453^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$           | $1531^{+18}_{-19}$           |
| $\Omega_{\mathrm{c}} h^2$                   | $0.1195^{+0.0024}_{-0.0024}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.013}_{-0.013}$       | $H(0.51)$                        | $89.66^{+0.56}_{-0.53}$      |
| $100\theta_{\mathrm{MC}}$                   | $1.04089^{+0.00062}_{-0.00062}$ | $\sigma_8/h^{0.5}$                    | $0.985^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.51)$           | $1983^{+22}_{-22}$           |
| $\tau$                                      | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $99.4^{+1.9}_{-1.9}$            | $H(0.61)$                        | $95.29^{+0.46}_{-0.44}$      |
| $\ln(10^{10} A_{\mathrm{s}})$               | $3.046^{+0.028}_{-0.026}$       | $\langle d^2 \rangle^{1/2}$           | $2.426^{+0.047}_{-0.047}$       | $D_{\mathrm{M}}(0.61)$           | $2308^{+23}_{-24}$           |
| $n_{\mathrm{s}}$                            | $0.9664^{+0.0089}_{-0.0090}$    | $z_{\mathrm{re}}$                     | $< 9.00$                        | $H(2.33)$                        | $236.2^{+1.5}_{-1.4}$        |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d} \ln k$ | $-0.006^{+0.014}_{-0.015}$      | $10^9 A_{\mathrm{s}}$                 | $2.103^{+0.059}_{-0.055}$       | $D_{\mathrm{M}}(2.33)$           | $5764^{+21}_{-22}$           |
| $r$   | $< 0.181$                       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.880^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$                | $0.457^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                          | $1.0006^{+0.0048}_{-0.0050}$    | $D_{40}$                              | $1239^{+43}_{-40}$              | $\sigma_8(0.15)$                 | $0.748^{+0.011}_{-0.0096}$   |
| $A_{100}^{\mathrm{PS}}$                     | $242^{+50}_{-50}$               | $D_{220}$                             | $5714^{+77}_{-78}$              | $f\sigma_8(0.38)$                | $0.475^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{PS}}$                     | $41^{+20}_{-20}$                | $D_{810}$                             | $2537^{+26}_{-27}$              | $\sigma_8(0.38)$                 | $0.6627^{+0.0094}_{-0.0082}$ |
| $A_{217}^{\mathrm{PS}}$                     | $102^{+30}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-10}$               | $f\sigma_8(0.51)$                | $0.4735^{+0.0089}_{-0.0091}$ |
| $A_{217}^{\mathrm{CIB}}$                    | $40^{+10}_{-10}$                | $D_{2000}$                            | $229.9^{+3.7}_{-3.7}$           | $\sigma_8(0.51)$                 | $0.6201^{+0.0084}_{-0.0079}$ |
| $A_{143}^{\mathrm{tSZ}}$                    | $< 7.38$                        | $n_{\mathrm{s},0.002}$                | $0.985^{+0.049}_{-0.045}$       | $f\sigma_8(0.61)$                | $0.4685^{+0.0081}_{-0.0082}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$          | $0.65^{+0.25}_{-0.24}$          | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$                 | $0.5901^{+0.0081}_{-0.0076}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$         | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00012}_{-0.00013}$ | $f\sigma_8(2.33)$                | $0.2975^{+0.0042}_{-0.0039}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$    | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.592^{+0.061}_{-0.057}$       | $\sigma_8(2.33)$                 | $0.3066^{+0.0045}_{-0.0042}$ |
| $A^{\mathrm{kSZ}}$                          | —                               | Age/Gyr                               | $13.799^{+0.047}_{-0.048}$      | $r_{0.002}$                      | $< 0.187$                    |
| $A_{100}^{\mathrm{dust}}$                   | $1.01^{+0.38}_{-0.38}$          | $z_{*}$                               | $1089.91^{+0.54}_{-0.53}$       | $r_{0.01}$                       | $< 0.181$                    |
| $A_{143}^{\mathrm{dust}}$                   | $0.96^{+0.35}_{-0.35}$          | $r_{*}$                               | $144.59^{+0.55}_{-0.55}$        | $\ln(10^{10} A_{\mathrm{t}})$    | $0.1^{+1.6}_{-2.2}$          |
| $A_{217}^{\mathrm{dust}}$                   | $0.97^{+0.20}_{-0.20}$          | $100\theta_{*}$                       | $1.04108^{+0.00061}_{-0.00061}$ | $r_{10}$                         | $< 0.0982$                   |
| $A_{143 \times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.889^{+0.052}_{-0.052}$      | $10^9 A_{\mathrm{t}}$            | $< 0.382$                    |
| $c_{100}$                                   | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.83^{+0.68}_{-0.70}$       | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.341$                    |
| $c_{217}$                                   | $1.0012^{+0.0030}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.27^{+0.57}_{-0.57}$        | $f_{2000}^{143}$                 | $30^{+7}_{-6}$               |
| $c_{TE}$                                    | $0.9962^{+0.0098}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14066^{+0.00067}_{-0.00069}$ | $f_{2000}^{217}$                 | $107.4^{+4.3}_{-4.2}$        |
| $c_{EE}$                                    | $0.9920^{+0.0097}_{-0.0097}$    | $100\theta_{\mathrm{D}}$              | $0.16081^{+0.00040}_{-0.00039}$ | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $H_0$                                       | $67.5^{+1.1}_{-1.1}$            | $z_{\mathrm{eq}}$                     | $3389^{+54}_{-54}$              | $\chi_{\mathrm{lensing}}^2$      | $9.53 (\nu: 0.3)$            |
| $\Omega_{\Lambda}$                          | $0.687^{+0.014}_{-0.015}$       | $k_{\mathrm{eq}}$                     | $0.01034^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{simall}}^2$       | $397.4 (\nu: 1.6)$           |
| $\Omega_{\mathrm{m}}$                       | $0.313^{+0.015}_{-0.014}$       | $100\theta_{\mathrm{eq}}$             | $0.816^{+0.010}_{-0.010}$       | $\chi_{\mathrm{lowl}}^2$         | $24.2 (\nu: 2.5)$            |
| $\Omega_{\mathrm{m}} h^2$                   | $0.1424^{+0.0023}_{-0.0023}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4506^{+0.0053}_{-0.0052}$    | $\chi_{\mathrm{CamSpec}}^2$      | $11514.0 (\nu: 16.9)$        |
| $\Omega_{\mathrm{m}} h^3$                   | $0.09616^{+0.00064}_{-0.00065}$ | $H(0.15)$                             | $72.80^{+0.94}_{-0.92}$         | $\chi_{\mathrm{prior}}^2$        | $7.8 (\nu: 5.9)$             |
| $\sigma_8$                                  | $0.809^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.15)$                | $642.1^{+9.3}_{-9.3}$           | $\chi_{\mathrm{CMB}}^2$          | $11945.1 (\nu: 17.9)$        |
| $S_8$                                       | $0.826^{+0.026}_{-0.025}$       | $H(0.38)$                             | $82.94^{+0.69}_{-0.67}$         |                                  |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11953.00; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.75; R - 1 = 0.01489$$



# 11.8 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_BAO\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                  | $0.02238^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.51)$           | $1979^{+17}_{-17}$           |
| $\Omega_{\mathrm{c}} h^2$                  | $0.1189^{+0.0019}_{-0.0019}$    | $\sigma_8/h^{0.5}$                    | $0.982^{+0.017}_{-0.016}$       | $H(0.61)$                        | $95.38^{+0.38}_{-0.37}$      |
| $100\theta_{\mathrm{MC}}$                  | $1.04096^{+0.00060}_{-0.00059}$ | $r_{\mathrm{drag}} h$                 | $99.8^{+1.4}_{-1.4}$            | $D_{\mathrm{M}}(0.61)$           | $2303^{+18}_{-19}$           |
| $\tau$                                     | $0.057^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.420^{+0.045}_{-0.044}$       | $H(2.33)$                        | $235.9^{+1.2}_{-1.2}$        |
| $\ln(10^{10} A_{\mathrm{s}})$              | $3.047^{+0.029}_{-0.027}$       | $z_{\mathrm{re}}$                     | $7.9^{+1.2}_{-1.4}$             | $D_{\mathrm{M}}(2.33)$           | $5760^{+18}_{-19}$           |
| $n_{\mathrm{s}}$                           | $0.9677^{+0.0081}_{-0.0082}$    | $10^9 A_{\mathrm{s}}$                 | $2.106^{+0.061}_{-0.058}$       | $f\sigma_8(0.15)$                | $0.454^{+0.011}_{-0.011}$    |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.006^{+0.014}_{-0.016}$      | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.021}_{-0.022}$       | $\sigma_8(0.15)$                 | $0.747^{+0.011}_{-0.0097}$   |
| $r$  | $< 0.185$                       | $D_{40}$                              | $1238^{+44}_{-39}$              | $f\sigma_8(0.38)$                | $0.4733^{+0.0092}_{-0.0090}$ |
| $y_{\mathrm{cal}}$                         | $1.0008^{+0.0048}_{-0.0049}$    | $D_{220}$                             | $5718^{+77}_{-80}$              | $\sigma_8(0.38)$                 | $0.6627^{+0.0092}_{-0.0088}$ |
| $A_{100}^{\mathrm{PS}}$                    | $241^{+50}_{-50}$               | $D_{810}$                             | $2538^{+26}_{-27}$              | $f\sigma_8(0.51)$                | $0.4721^{+0.0083}_{-0.0079}$ |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $D_{1420}$                            | $816.1^{+9.9}_{-10}$            | $\sigma_8(0.51)$                 | $0.6203^{+0.0087}_{-0.0082}$ |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $D_{2000}$                            | $230.1^{+3.7}_{-3.6}$           | $f\sigma_8(0.61)$                | $0.4673^{+0.0078}_{-0.0074}$ |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.985^{+0.049}_{-0.045}$       | $\sigma_8(0.61)$                 | $0.5903^{+0.0083}_{-0.0078}$ |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.38$                        | $Y_{\mathrm{P}}$                      | $0.24540^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$                | $0.2977^{+0.0042}_{-0.0040}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.66^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24672^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$                 | $0.3070^{+0.0045}_{-0.0043}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.585^{+0.056}_{-0.054}$       | $r_{0.002}$                      | $< 0.191$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.791^{+0.042}_{-0.043}$      | $r_{0.01}$                       | $< 0.185$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $z_*$                                 | $1089.82^{+0.46}_{-0.46}$       | $\ln(10^{10} A_{\mathrm{t}})$    | $0.1^{+1.6}_{-2.2}$          |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $r_*$                                 | $144.70^{+0.45}_{-0.46}$        | $r_{10}$                         | $< 0.101$                    |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.34}_{-0.34}$          | $100\theta_*$                         | $1.04114^{+0.00060}_{-0.00058}$ | $10^9 A_{\mathrm{t}}$            | $< 0.390$                    |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.898^{+0.044}_{-0.044}$      | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.348$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.87^{+0.67}_{-0.66}$       | $f_{2000}^{143}$                 | $30^{+7}_{-6}$               |
| $c_{100}$                                  | $0.9976^{+0.0020}_{-0.0020}$    | $r_{\mathrm{drag}}$                   | $147.37^{+0.49}_{-0.49}$        | $f_{2000}^{217}$                 | $107.3^{+4.3}_{-4.3}$        |
| $c_{217}$                                  | $1.0012^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.14058^{+0.00063}_{-0.00064}$ | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $c_{TE}$                                   | $0.9964^{+0.0098}_{-0.0098}$    | $100\theta_{\mathrm{D}}$              | $0.16079^{+0.00039}_{-0.00038}$ | $\chi_{\mathrm{lensing}}^2$      | $9.52 (\nu: 0.3)$            |
| $c_{EE}$                                   | $0.9923^{+0.0097}_{-0.0098}$    | $z_{\mathrm{eq}}$                     | $3377^{+43}_{-42}$              | $\chi_{\mathrm{simall}}^2$       | $397.6 (\nu: 1.8)$           |
| $H_0$                                      | $67.74^{+0.86}_{-0.83}$         | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{lowl}}^2$         | $24.1 (\nu: 2.4)$            |
| $\Omega_{\Lambda}$                         | $0.691^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{eq}}$             | $0.8179^{+0.0080}_{-0.0079}$    | $\chi_{\mathrm{CamSpec}}^2$      | $11513.9 (\nu: 16.5)$        |
| $\Omega_{\mathrm{m}}$                      | $0.309^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4518^{+0.0041}_{-0.0041}$    | $\chi_{6\mathrm{DF}}^2$          | $0.040 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                  | $0.1420^{+0.0018}_{-0.0018}$    | $H(0.15)$                             | $73.00^{+0.73}_{-0.71}$         | $\chi_{\mathrm{MGS}}^2$          | $1.37 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^3$                  | $0.09617^{+0.00064}_{-0.00065}$ | $D_{\mathrm{M}}(0.15)$                | $640.1^{+7.1}_{-7.2}$           | $\chi_{\mathrm{DR12BAO}}^2$      | $4.5 (\nu: 0.7)$             |
| $\sigma_8$                                 | $0.809^{+0.012}_{-0.011}$       | $H(0.38)$                             | $83.08^{+0.55}_{-0.54}$         | $\chi_{\mathrm{prior}}^2$        | $7.9 (\nu: 5.9)$             |
| $S_8$                                      | $0.821^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$                | $1527^{+14}_{-14}$              | $\chi_{\mathrm{CMB}}^2$          | $11945.1 (\nu: 17.3)$        |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$       | $0.450^{+0.012}_{-0.011}$       | $H(0.51)$                             | $89.77^{+0.46}_{-0.43}$         | $\chi_{\mathrm{BAO}}^2$          | $5.90 (\nu: 0.4)$            |

$\bar{\chi}_{\mathrm{eff}}^2 = 11958.86$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.60$ ;  $R - 1 = 0.01525$



## 11.9 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022129 | $0.02215^{+0.00046}_{-0.00046}$ | $\Omega_m h^3$              | 0.09605  | $0.09606^{+0.00097}_{-0.00096}$ | $H(0.38)$                   | 82.39    | $82.5^{+1.1}_{-1.1}$         |
| $\Omega_c h^2$              | 0.12137  | $0.1211^{+0.0041}_{-0.0041}$    | $\sigma_8$                  | 0.8144   | $0.814^{+0.017}_{-0.018}$       | $D_M(0.38)$                 | 1546.2   | $1544^{+31}_{-31}$           |
| $100\theta_{MC}$            | 1.04079  | $1.04080^{+0.00094}_{-0.00093}$ | $S_8$                       | 0.8472   | $0.845^{+0.047}_{-0.046}$       | $H(0.51)$                   | 89.24    | $89.30^{+0.88}_{-0.83}$      |
| $\tau$                      | 0.0534   | $0.054^{+0.018}_{-0.016}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4640   | $0.463^{+0.026}_{-0.025}$       | $D_M(0.51)$                 | 2000.9   | $1999^{+36}_{-36}$           |
| $\ln(10^{10} A_s)$          | 3.0451   | $3.046^{+0.036}_{-0.034}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6147   | $0.614^{+0.022}_{-0.023}$       | $H(0.61)$                   | 94.96    | $95.00^{+0.71}_{-0.66}$      |
| $n_s$                       | 0.9605   | $0.962^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$          | 0.9977   | $0.997^{+0.031}_{-0.031}$       | $D_M(0.61)$                 | 2326.7   | $2324^{+38}_{-39}$           |
| $dn_s/d \ln k$              | -0.0056  | $-0.005^{+0.015}_{-0.015}$      | $r_{drag} h$                | 97.95    | $98.1^{+3.1}_{-3.1}$            | $H(2.33)$                   | 237.21   | $237.1^{+2.5}_{-2.5}$        |
| $r$                         | 0.0137   | $< 0.0631$                      | $\langle d^2 \rangle^{1/2}$ | 2.457    | $2.454^{+0.074}_{-0.074}$       | $D_M(2.33)$                 | 5778.8   | $5777^{+32}_{-33}$           |
| $y_{cal}$                   | 1.00067  | $1.0007^{+0.0050}_{-0.0049}$    | $z_{re}$                    | 7.66     | $7.7^{+1.7}_{-1.7}$             | $f\sigma_8(0.15)$           | 0.4675   | $0.467^{+0.024}_{-0.023}$    |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.101    | $2.103^{+0.078}_{-0.071}$       | $\sigma_8(0.15)$            | 0.7512   | $0.751^{+0.015}_{-0.015}$    |
| $A_{B,sync}$                | 1.48     | $< 3.65$                        | $10^9 A_s e^{-2\tau}$       | 1.8884   | $1.887^{+0.028}_{-0.028}$       | $f\sigma_8(0.38)$           | 0.4830   | $0.482^{+0.018}_{-0.019}$    |
| $\alpha_{B,dust}$           | -0.53    | —                               | $D_{40}$                    | 1227.8   | $1231^{+42}_{-41}$              | $\sigma_8(0.38)$            | 0.6645   | $0.665^{+0.012}_{-0.012}$    |
| $\beta_{B,dust}$            | 1.579    | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5704     | $5703^{+82}_{-81}$              | $f\sigma_8(0.51)$           | 0.4800   | $0.479^{+0.016}_{-0.016}$    |
| $\alpha_{B,sync}$           | -0.25    | —                               | $D_{810}$                   | 2536.8   | $2537^{+28}_{-27}$              | $\sigma_8(0.51)$            | 0.6213   | $0.621^{+0.011}_{-0.011}$    |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                  | 812.8    | $814^{+10}_{-10}$               | $f\sigma_8(0.61)$           | 0.4740   | $0.473^{+0.014}_{-0.014}$    |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.35^{+0.53}_{-0.57}$         | $D_{2000}$                  | 228.70   | $229.0^{+3.9}_{-3.9}$           | $\sigma_8(0.61)$            | 0.5908   | $0.591^{+0.011}_{-0.010}$    |
| $A_{100}^{PS}$              | 249.5    | $246^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9786   | $0.979^{+0.047}_{-0.046}$       | $f\sigma_8(2.33)$           | 0.2974   | $0.2975^{+0.0053}_{-0.0050}$ |
| $A_{143}^{PS}$              | 39.5     | $43^{+20}_{-20}$                | $Y_P$                       | 0.245296 | $0.24530^{+0.00018}_{-0.00022}$ | $\sigma_8(2.33)$            | 0.3060   | $0.3063^{+0.0056}_{-0.0052}$ |
| $A_{217}^{PS}$              | 97.9     | $100^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246622 | $0.24663^{+0.00018}_{-0.00022}$ | $r_{0.002}$                 | 0.0125   | $< 0.0597$                   |
| $A_{217}^{CIB}$             | 44.0     | $42^{+10}_{-10}$                | $10^5 D/H$                  | 2.632    | $2.628^{+0.088}_{-0.085}$       | $r_{0.01}$                  | 0.0130   | $< 0.0608$                   |
| $A_{143}^{tSZ}$             | 3.85     | $< 7.28$                        | Age/Gyr                     | 13.831   | $13.827^{+0.072}_{-0.074}$      | $\ln(10^{10} A_t)$          | -1.25    | $-0.9^{+1.5}_{-2.0}$         |
| $r_{143 \times 217}^{PS}$   | 0.542    | $0.64^{+0.25}_{-0.25}$          | $z_*$                       | 1090.35  | $1090.30^{+0.81}_{-0.81}$       | $r_{10}$                    | 0.0065   | $< 0.0310$                   |
| $r_{143 \times 217}^{CIB}$  | 0.66     | —                               | $r_*$                       | 144.26   | $144.31^{+0.95}_{-0.94}$        | $10^9 A_t$                  | 0.029    | $< 0.133$                    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $100\theta_*$               | 1.04099  | $1.04101^{+0.00093}_{-0.00091}$ | $10^9 A_t e^{-2\tau}$       | 0.026    | $< 0.119$                    |
| $A^{kSZ}$                   | 4.7      | —                               | $D_M(z_*)/\text{Gpc}$       | 13.858   | $13.862^{+0.088}_{-0.087}$      | $f_{2000}^{143}$            | 32.5     | $32^{+7}_{-6}$               |
| $A_{100}^{dust}$            | 1.015    | $1.01^{+0.38}_{-0.38}$          | $z_{drag}$                  | 1059.47  | $1059.51^{+0.96}_{-0.99}$       | $f_{2000}^{217}$            | 108.75   | $108.3^{+4.3}_{-4.3}$        |
| $A_{143}^{dust}$            | 0.984    | $0.98^{+0.35}_{-0.34}$          | $r_{drag}$                  | 147.00   | $147.04^{+0.98}_{-0.96}$        | $f_{2000}^{143 \times 217}$ | 34.09    | $34^{+5}_{-5}$               |
| $A_{217}^{dust}$            | 0.962    | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | 0.14078  | $0.1408^{+0.0011}_{-0.0011}$    | $\chi_{BKPLANCK}^2$         | 734.9    | $739.2 (\nu: 3.7)$           |
| $A_{143 \times 217}^{dust}$ | 1.007    | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | 0.16103  | $0.16101^{+0.00058}_{-0.00056}$ | $\chi_{small}^2$            | 396.03   | $397.3 (\nu: 1.9)$           |
| $c_{100}$                   | 0.99739  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{eq}$                    | 3429     | $3424^{+93}_{-92}$              | $\chi_{lowl}^2$             | 22.86    | $23.6 (\nu: 2.4)$            |
| $c_{217}$                   | 1.00143  | $1.0013^{+0.0031}_{-0.0031}$    | $k_{eq}$                    | 0.010466 | $0.01045^{+0.00028}_{-0.00028}$ | $\chi_{CamSpec}^2$          | 7050.6   | $7064.4 (\nu: 15.8)$         |
| $H_0$                       | 66.63    | $66.7^{+1.8}_{-1.7}$            | $100\theta_{eq}$            | 0.8078   | $0.809^{+0.017}_{-0.017}$       | $\chi_{prior}^2$            | 2.6      | $9.3 (\nu: 7.4)$             |
| $\Omega_\Lambda$            | 0.6753   | $0.677^{+0.025}_{-0.026}$       | $100\theta_{s,eq}$          | 0.4467   | $0.4472^{+0.0090}_{-0.0087}$    | $\chi_{CMB}^2$              | 8204.4   | $8224.5 (\nu: 20.0)$         |
| $\Omega_m$                  | 0.3247   | $0.323^{+0.026}_{-0.025}$       | $H(0.15)$                   | 72.05    | $72.2^{+1.5}_{-1.5}$            |                             |          |                              |
| $\Omega_m h^2$              | 0.14414  | $0.1439^{+0.0039}_{-0.0039}$    | $D_M(0.15)$                 | 649.7    | $649^{+15}_{-15}$               |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8206.96$ ;  $\bar{\chi}_{eff}^2 = 8233.85$ ;  $R - 1 = 0.00340$

$\chi_{eff}^2$ : CMB - BK15\_dust: 734.86 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.03 commander\_dx12\_v3\_2\_29: 22.86 CamSpec like\_10.7HM: 7050.61



# 11.10 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022242 | $0.02226^{+0.00042}_{-0.00042}$ | $\sigma_8$                  | 0.8082   | $0.809^{+0.016}_{-0.015}$       | $H(0.51)$                   | 89.66    | $89.68^{+0.60}_{-0.57}$      |
| $\Omega_c h^2$              | 0.11917  | $0.1192^{+0.0024}_{-0.0023}$    | $S_8$                       | 0.8229   | $0.824^{+0.029}_{-0.029}$       | $D_M(0.51)$                 | 1982.2   | $1982^{+22}_{-22}$           |
| $100\theta_{MC}$            | 1.04104  | $1.04106^{+0.00082}_{-0.00085}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4507   | $0.451^{+0.016}_{-0.016}$       | $H(0.61)$                   | 95.28    | $95.29^{+0.51}_{-0.49}$      |
| $\tau$                      | 0.0553   | $0.056^{+0.018}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6035   | $0.604^{+0.016}_{-0.015}$       | $D_M(0.61)$                 | 2306.6   | $2306^{+23}_{-24}$           |
| $\ln(10^{10} A_s)$          | 3.0438   | $3.046^{+0.038}_{-0.034}$       | $\sigma_8/h^{0.5}$          | 0.9831   | $0.984^{+0.023}_{-0.022}$       | $H(2.33)$                   | 235.89   | $235.9^{+1.6}_{-1.5}$        |
| $n_s$                       | 0.9657   | $0.9663^{+0.0090}_{-0.0089}$    | $r_{drag} h$                | 99.65    | $99.6^{+1.9}_{-1.8}$            | $D_M(2.33)$                 | 5765.6   | $5765^{+25}_{-25}$           |
| $dn_s/d \ln k$              | -0.0048  | $-0.005^{+0.015}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$ | 2.424    | $2.426^{+0.056}_{-0.057}$       | $f\sigma_8(0.15)$           | 0.4553   | $0.456^{+0.015}_{-0.015}$    |
| $r$                         | 0.0170   | $< 0.0661$                      | $z_{re}$                    | 7.80     | $7.8^{+1.7}_{-1.6}$             | $\sigma_8(0.15)$            | 0.7468   | $0.748^{+0.014}_{-0.013}$    |
| $y_{cal}$                   | 1.0008   | $1.0008^{+0.0050}_{-0.0050}$    | $10^9 A_s$                  | 2.098    | $2.103^{+0.081}_{-0.071}$       | $f\sigma_8(0.38)$           | 0.4737   | $0.474^{+0.013}_{-0.013}$    |
| $A_{B,dust}$                | 4.60     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | 1.8789   | $1.879^{+0.024}_{-0.024}$       | $\sigma_8(0.38)$            | 0.6621   | $0.663^{+0.012}_{-0.011}$    |
| $A_{B,sync}$                | 1.45     | $< 3.63$                        | $D_{40}$                    | 1220.0   | $1224^{+40}_{-39}$              | $f\sigma_8(0.51)$           | 0.4724   | $0.473^{+0.012}_{-0.011}$    |
| $\alpha_{B,dust}$           | -0.50    | —                               | $D_{220}$                   | 5713     | $5712^{+80}_{-80}$              | $\sigma_8(0.51)$            | 0.6196   | $0.620^{+0.011}_{-0.011}$    |
| $\beta_{B,dust}$            | 1.575    | $1.60^{+0.19}_{-0.19}$          | $D_{810}$                   | 2535.7   | $2537^{+27}_{-28}$              | $f\sigma_8(0.61)$           | 0.4675   | $0.468^{+0.011}_{-0.010}$    |
| $\alpha_{B,sync}$           | -0.38    | —                               | $D_{1420}$                  | 814.3    | $815^{+10}_{-10}$               | $\sigma_8(0.61)$            | 0.5896   | $0.590^{+0.011}_{-0.010}$    |
| $\beta_{B,sync}$            | -3.05    | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | 229.30   | $229.6^{+3.9}_{-3.8}$           | $f\sigma_8(2.33)$           | 0.2973   | $0.2976^{+0.0055}_{-0.0050}$ |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.35^{+0.53}_{-0.59}$         | $n_{s,0.002}$               | 0.9811   | $0.982^{+0.047}_{-0.046}$       | $\sigma_8(2.33)$            | 0.3065   | $0.3068^{+0.0058}_{-0.0051}$ |
| $A_{100}^{PS}$              | 249.0    | $245^{+50}_{-50}$               | $Y_P$                       | 0.245343 | $0.24535^{+0.00017}_{-0.00018}$ | $r_{0.002}$                 | 0.0157   | $< 0.0635$                   |
| $A_{143}^{PS}$              | 41.7     | $42^{+20}_{-20}$                | $Y_P^{BBN}$                 | 0.246670 | $0.24667^{+0.00017}_{-0.00018}$ | $r_{0.01}$                  | 0.0162   | $< 0.0641$                   |
| $A_{217}^{PS}$              | 98.5     | $100^{+30}_{-30}$               | $10^5 D/H$                  | 2.610    | $2.607^{+0.080}_{-0.077}$       | $\ln(10^{10} A_t)$          | -1.03    | $-0.8^{+1.5}_{-2.0}$         |
| $A_{217}^{CIB}$             | 42.9     | $42^{+10}_{-10}$                | Age/Gyr                     | 13.803   | $13.801^{+0.057}_{-0.058}$      | $r_{10}$                    | 0.0081   | $< 0.0329$                   |
| $A_{143}^{tSZ}$             | 3.55     | $< 7.33$                        | $z_*$                       | 1090.01  | $1089.99^{+0.61}_{-0.62}$       | $10^9 A_t$                  | 0.036    | $< 0.139$                    |
| $r_{143 \times 217}^{PS}$   | 0.583    | $0.64^{+0.25}_{-0.25}$          | $r_*$                       | 144.74   | $144.72^{+0.63}_{-0.64}$        | $10^9 A_t e^{-2\tau}$       | 0.032    | $< 0.125$                    |
| $r_{143 \times 217}^{CIB}$  | 0.68     | —                               | $100\theta_*$               | 1.04124  | $1.04125^{+0.00081}_{-0.00084}$ | $f_{2000}^{143}$            | 32.0     | $31^{+7}_{-6}$               |
| $\xi^{tSZ \times CIB}$      | 0.29     | —                               | $D_M(z_*)/\text{Gpc}$       | 13.901   | $13.899^{+0.062}_{-0.063}$      | $f_{2000}^{217}$            | 108.26   | $108.0^{+4.3}_{-4.2}$        |
| $A^{kSZ}$                   | 5.1      | —                               | $z_{drag}$                  | 1059.59  | $1059.62^{+0.96}_{-0.98}$       | $f_{2000}^{143 \times 217}$ | 33.61    | $33^{+5}_{-5}$               |
| $A_{100}^{dust}$            | 1.016    | $1.01^{+0.38}_{-0.38}$          | $r_{drag}$                  | 147.45   | $147.43^{+0.72}_{-0.72}$        | $\chi_{BKPLANCK}^2$         | 735.64   | $740.0 (\nu: 3.6)$           |
| $A_{143}^{dust}$            | 0.988    | $0.97^{+0.35}_{-0.35}$          | $k_D$                       | 0.14039  | $0.14043^{+0.00095}_{-0.00096}$ | $\chi_{small}^2$            | 396.20   | $397.5 (\nu: 2.5)$           |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.21}_{-0.21}$          | $100\theta_D$               | 0.16098  | $0.16096^{+0.00057}_{-0.00056}$ | $\chi_{lowl}^2$             | 22.26    | $23.0 (\nu: 1.9)$            |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.33}$          | $z_{eq}$                    | 3379     | $3380^{+56}_{-55}$              | $\chi_{CamSpec}^2$          | 7051.6   | $7064.6 (\nu: 15.3)$         |
| $c_{100}$                   | 0.99743  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{eq}$                    | 0.010314 | $0.01032^{+0.00017}_{-0.00017}$ | $\chi_{6DF}^2$              | 0.029    | $0.066 (\nu: 0.0)$           |
| $c_{217}$                   | 1.00144  | $1.0013^{+0.0030}_{-0.0031}$    | $100\theta_{eq}$            | 0.8172   | $0.817^{+0.010}_{-0.010}$       | $\chi_{MGS}^2$              | 1.22     | $1.29 (\nu: 0.1)$            |
| $H_0$                       | 67.58    | $67.6^{+1.1}_{-1.1}$            | $100\theta_{s,eq}$          | 0.4515   | $0.4514^{+0.0053}_{-0.0053}$    | $\chi_{DR12BAO}^2$          | 4.37     | $5.0 (\nu: 1.5)$             |
| $\Omega_\Lambda$            | 0.6890   | $0.689^{+0.014}_{-0.015}$       | $H(0.15)$                   | 72.85    | $72.87^{+0.93}_{-0.91}$         | $\chi_{prior}^2$            | 2.5      | $9.4 (\nu: 7.4)$             |
| $\Omega_m$                  | 0.3110   | $0.311^{+0.015}_{-0.014}$       | $D_M(0.15)$                 | 641.5    | $641.5^{+9.1}_{-9.1}$           | $\chi_{BAO}^2$              | 5.61     | $6.3 (\nu: 1.1)$             |
| $\Omega_m h^2$              | 0.14205  | $0.1421^{+0.0024}_{-0.0023}$    | $H(0.38)$                   | 82.95    | $82.97^{+0.71}_{-0.68}$         | $\chi_{CMB}^2$              | 8205.7   | $8225.0 (\nu: 19.8)$         |
| $\Omega_m h^3$              | 0.09600  | $0.09605^{+0.00097}_{-0.00097}$ | $D_M(0.38)$                 | 1530.1   | $1530^{+18}_{-19}$              |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 8213.81$ ;  $\bar{\chi}_{\text{eff}}^2 = 8240.71$ ;  $R - 1 = 0.00691$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.03 MGS: 1.22 DR12BAO: 4.37 CMB - BK15\_dust: 735.64 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.20 commander\_dx12\_v3\_2\_29: 22.25 CamSpec like\_10.7HM: 7051.59



### 11.11 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022141 | $0.02217^{+0.00045}_{-0.00044}$ | $\Omega_m h^3$              | 0.09596  | $0.09601^{+0.00095}_{-0.00094}$ | $H(0.38)$                   | 82.54    | $82.61^{+0.91}_{-0.87}$      |
| $\Omega_c h^2$              | 0.12063  | $0.1205^{+0.0031}_{-0.0031}$    | $\sigma_8$                  | 0.8119   | $0.812^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1541.6   | $1540^{+24}_{-25}$           |
| $100\theta_{MC}$            | 1.04082  | $1.04085^{+0.00089}_{-0.00089}$ | $S_8$                       | 0.8389   | $0.838^{+0.032}_{-0.031}$       | $H(0.51)$                   | 89.34    | $89.40^{+0.74}_{-0.70}$      |
| $\tau$                      | 0.0535   | $0.054^{+0.017}_{-0.015}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4595   | $0.459^{+0.017}_{-0.017}$       | $D_M(0.51)$                 | 1995.6   | $1994^{+28}_{-29}$           |
| $\ln(10^{10} A_s)$          | 3.0430   | $3.043^{+0.033}_{-0.030}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6108   | $0.610^{+0.015}_{-0.015}$       | $H(0.61)$                   | 95.03    | $95.08^{+0.62}_{-0.58}$      |
| $n_s$                       | 0.9620   | $0.963^{+0.010}_{-0.0099}$      | $\sigma_8/h^{0.5}$          | 0.9925   | $0.992^{+0.020}_{-0.020}$       | $D_M(0.61)$                 | 2321.0   | $2319^{+31}_{-31}$           |
| $dn_s/d \ln k$              | -0.0041  | $-0.004^{+0.015}_{-0.015}$      | $r_{drag} h$                | 98.48    | $98.6^{+2.4}_{-2.4}$            | $H(2.33)$                   | 236.74   | $236.7^{+1.9}_{-1.9}$        |
| $r$                         | 0.0130   | $< 0.0628$                      | $\langle d^2 \rangle^{1/2}$ | 2.448    | $2.445^{+0.053}_{-0.052}$       | $D_M(2.33)$                 | 5776.2   | $5774^{+29}_{-30}$           |
| $y_{cal}$                   | 1.00061  | $1.0007^{+0.0049}_{-0.0049}$    | $z_{re}$                    | 7.66     | $7.7^{+1.6}_{-1.6}$             | $f\sigma_8(0.15)$           | 0.4634   | $0.463^{+0.016}_{-0.016}$    |
| $A_{B,dust}$                | 4.63     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.097    | $2.098^{+0.070}_{-0.063}$       | $\sigma_8(0.15)$            | 0.7493   | $0.749^{+0.011}_{-0.011}$    |
| $A_{B,sync}$                | 1.47     | $< 3.64$                        | $10^9 A_s e^{-2\tau}$       | 1.8842   | $1.884^{+0.023}_{-0.023}$       | $f\sigma_8(0.38)$           | 0.4797   | $0.479^{+0.012}_{-0.012}$    |
| $\alpha_{B,dust}$           | -0.52    | —                               | $D_{40}$                    | 1227.6   | $1231^{+41}_{-40}$              | $\sigma_8(0.38)$            | 0.6633   | $0.663^{+0.010}_{-0.0093}$   |
| $\beta_{B,dust}$            | 1.577    | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5706     | $5706^{+82}_{-81}$              | $f\sigma_8(0.51)$           | 0.4773   | $0.477^{+0.010}_{-0.010}$    |
| $\alpha_{B,sync}$           | -0.26    | —                               | $D_{810}$                   | 2535.1   | $2536^{+27}_{-27}$              | $\sigma_8(0.51)$            | 0.6203   | $0.6205^{+0.0095}_{-0.0088}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                  | 812.9    | $814^{+11}_{-10}$               | $f\sigma_8(0.61)$           | 0.4716   | $0.4713^{+0.0093}_{-0.0092}$ |
| $\epsilon_{dust,sync}$      | -0.33    | $-0.35^{+0.53}_{-0.58}$         | $D_{2000}$                  | 228.81   | $229.2^{+4.0}_{-3.9}$           | $\sigma_8(0.61)$            | 0.5900   | $0.5902^{+0.0092}_{-0.0085}$ |
| $A_{100}^{PS}$              | 248.9    | $245^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9754   | $0.976^{+0.047}_{-0.046}$       | $f\sigma_8(2.33)$           | 0.29715  | $0.2973^{+0.0049}_{-0.0045}$ |
| $A_{143}^{PS}$              | 39.5     | $42^{+20}_{-20}$                | $Y_P$                       | 0.245301 | $0.24531^{+0.00018}_{-0.00021}$ | $\sigma_8(2.33)$            | 0.3060   | $0.3062^{+0.0054}_{-0.0049}$ |
| $A_{217}^{PS}$              | 97.7     | $100^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246627 | $0.24664^{+0.00018}_{-0.00021}$ | $r_{0.002}$                 | 0.0118   | $< 0.0593$                   |
| $A_{217}^{CIB}$             | 44.5     | $42^{+10}_{-10}$                | $10^5 D/H$                  | 2.629    | $2.623^{+0.086}_{-0.083}$       | $r_{0.01}$                  | 0.0124   | $< 0.0604$                   |
| $A_{143}^{tSZ}$             | 4.11     | $< 7.33$                        | Age/Gyr                     | 13.826   | $13.821^{+0.066}_{-0.068}$      | $\ln(10^{10} A_t)$          | -1.30    | $-0.9^{+1.5}_{-2.0}$         |
| $r_{143 \times 217}^{PS}$   | 0.544    | $0.64^{+0.25}_{-0.25}$          | $z_*$                       | 1090.27  | $1090.21^{+0.73}_{-0.72}$       | $r_{10}$                    | 0.0061   | $< 0.0308$                   |
| $r_{143 \times 217}^{CIB}$  | 0.67     | —                               | $r_*$                       | 144.44   | $144.45^{+0.74}_{-0.73}$        | $10^9 A_t$                  | 0.027    | $< 0.132$                    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $100\theta_*$               | 1.04102  | $1.04106^{+0.00088}_{-0.00087}$ | $10^9 A_t e^{-2\tau}$       | 0.025    | $< 0.118$                    |
| $A^{kSZ}$                   | 4.2      | —                               | $D_M(z_*)/\text{Gpc}$       | 13.875   | $13.876^{+0.070}_{-0.068}$      | $f_{2000}^{143}$            | 32.4     | $32^{+7}_{-6}$               |
| $A_{100}^{dust}$            | 1.018    | $1.01^{+0.38}_{-0.38}$          | $z_{drag}$                  | 1059.44  | $1059.52^{+0.95}_{-0.96}$       | $f_{2000}^{217}$            | 108.53   | $108.1^{+4.3}_{-4.3}$        |
| $A_{143}^{dust}$            | 0.979    | $0.98^{+0.35}_{-0.34}$          | $r_{drag}$                  | 147.18   | $147.18^{+0.78}_{-0.76}$        | $f_{2000}^{143 \times 217}$ | 33.93    | $34^{+5}_{-5}$               |
| $A_{217}^{dust}$            | 0.959    | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | 0.14059  | $0.14062^{+0.00094}_{-0.00095}$ | $\chi_{lensing}^2$          | 9.11     | $9.71 (\nu: 0.5)$            |
| $A_{143 \times 217}^{dust}$ | 1.005    | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | 0.16104  | $0.16101^{+0.00058}_{-0.00056}$ | $\chi_{BKPLANCK}^2$         | 735.18   | $739.5 (\nu: 3.5)$           |
| $c_{100}$                   | 0.99744  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{eq}$                    | 3412     | $3409^{+70}_{-71}$              | $\chi_{small}^2$            | 396.02   | $397.1 (\nu: 1.6)$           |
| $c_{217}$                   | 1.00145  | $1.0013^{+0.0030}_{-0.0031}$    | $k_{eq}$                    | 0.010413 | $0.01041^{+0.00021}_{-0.00022}$ | $\chi_{lowl}^2$             | 22.95    | $23.7 (\nu: 2.5)$            |
| $H_0$                       | 66.91    | $67.0^{+1.4}_{-1.4}$            | $100\theta_{eq}$            | 0.8109   | $0.811^{+0.013}_{-0.013}$       | $\chi_{CamSpec}^2$          | 7050.4   | $7063.8 (\nu: 14.7)$         |
| $\Omega_\Lambda$            | 0.6797   | $0.681^{+0.019}_{-0.020}$       | $100\theta_{s,eq}$          | 0.4483   | $0.4486^{+0.0069}_{-0.0066}$    | $\chi_{prior}^2$            | 2.5      | $9.3 (\nu: 7.3)$             |
| $\Omega_m$                  | 0.3203   | $0.319^{+0.020}_{-0.019}$       | $H(0.15)$                   | 72.28    | $72.4^{+1.2}_{-1.2}$            | $\chi_{CMB}^2$              | 8213.7   | $8233.8 (\nu: 19.8)$         |
| $\Omega_m h^2$              | 0.14341  | $0.1433^{+0.0029}_{-0.0030}$    | $D_M(0.15)$                 | 647.3    | $647^{+12}_{-12}$               |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8216.23$ ;  $\bar{\chi}_{eff}^2 = 8243.12$ ;  $R - 1 = 0.00347$

$\chi_{eff}^2$ : CMB - smicadx12.Dec5.ftl\_mv2.ndclpp\_p.teb\_consext8: 9.11 BK15\_dust: 735.18 small\_100x143\_offlike5.EE\_Aplanck\_B: 396.02 commander\_dx12\_v3\_2.29: 22.95 CamSpec like\_10.7HM: 7050.44



## 11.12 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022257 | $0.02226^{+0.00042}_{-0.00042}$ | $\sigma_8$                  | 0.8095   | $0.810^{+0.012}_{-0.012}$       | $H(0.51)$                   | 89.65    | $89.66^{+0.56}_{-0.55}$      |
| $\Omega_c h^2$              | 0.11935  | $0.1193^{+0.0022}_{-0.0021}$    | $S_8$                       | 0.8255   | $0.826^{+0.023}_{-0.023}$       | $D_M(0.51)$                 | 1983.1   | $1983^{+20}_{-21}$           |
| $100\theta_{MC}$            | 1.04105  | $1.04104^{+0.00082}_{-0.00084}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4521   | $0.452^{+0.013}_{-0.013}$       | $H(0.61)$                   | 95.272   | $95.28^{+0.49}_{-0.48}$      |
| $\tau$                      | 0.0563   | $0.057^{+0.017}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6050   | $0.605^{+0.012}_{-0.012}$       | $D_M(0.61)$                 | 2307.5   | $2307^{+22}_{-22}$           |
| $\ln(10^{10} A_s)$          | 3.0461   | $3.048^{+0.033}_{-0.030}$       | $\sigma_8/h^{0.5}$          | 0.9851   | $0.986^{+0.017}_{-0.017}$       | $H(2.33)$                   | 236.03   | $236.0^{+1.4}_{-1.4}$        |
| $n_s$                       | 0.9652   | $0.9661^{+0.0086}_{-0.0086}$    | $r_{drag} h$                | 99.53    | $99.6^{+1.6}_{-1.7}$            | $D_M(2.33)$                 | 5765.4   | $5765^{+25}_{-25}$           |
| $dn_s/d \ln k$              | -0.0045  | $-0.004^{+0.015}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$ | 2.4306   | $2.431^{+0.046}_{-0.045}$       | $f\sigma_8(0.15)$           | 0.4567   | $0.457^{+0.012}_{-0.012}$    |
| $r$                         | 0.0155   | $< 0.0645$                      | $z_{re}$                    | 7.89     | $7.9^{+1.6}_{-1.5}$             | $\sigma_8(0.15)$            | 0.7480   | $0.749^{+0.011}_{-0.011}$    |
| $y_{cal}$                   | 1.00075  | $1.0010^{+0.0050}_{-0.0049}$    | $10^9 A_s$                  | 2.103    | $2.107^{+0.072}_{-0.062}$       | $f\sigma_8(0.38)$           | 0.4749   | $0.4752^{+0.0098}_{-0.0096}$ |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | 1.8796   | $1.880^{+0.023}_{-0.022}$       | $\sigma_8(0.38)$            | 0.6630   | $0.664^{+0.010}_{-0.0095}$   |
| $A_{B,sync}$                | 1.42     | $< 3.65$                        | $D_{40}$                    | 1222.2   | $1227^{+39}_{-39}$              | $f\sigma_8(0.51)$           | 0.4734   | $0.4738^{+0.0088}_{-0.0086}$ |
| $\alpha_{B,dust}$           | -0.51    | —                               | $D_{220}$                   | 5716     | $5716^{+80}_{-80}$              | $\sigma_8(0.51)$            | 0.6204   | $0.6211^{+0.0097}_{-0.0089}$ |
| $\beta_{B,dust}$            | 1.574    | $1.60^{+0.19}_{-0.19}$          | $D_{810}$                   | 2535.7   | $2537^{+27}_{-27}$              | $f\sigma_8(0.61)$           | 0.4684   | $0.4688^{+0.0081}_{-0.0080}$ |
| $\alpha_{B,sync}$           | -0.48    | —                               | $D_{1420}$                  | 814.2    | $815^{+10}_{-10}$               | $\sigma_8(0.61)$            | 0.5903   | $0.5910^{+0.0093}_{-0.0085}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | 229.35   | $229.7^{+3.8}_{-3.8}$           | $f\sigma_8(2.33)$           | 0.29764  | $0.2980^{+0.0048}_{-0.0044}$ |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.34^{+0.53}_{-0.58}$         | $n_{s,0.002}$               | 0.9796   | $0.980^{+0.047}_{-0.046}$       | $\sigma_8(2.33)$            | 0.30683  | $0.3072^{+0.0052}_{-0.0047}$ |
| $A_{100}^{PS}$              | 248.2    | $245^{+50}_{-50}$               | $Y_P$                       | 0.245349 | $0.24535^{+0.00017}_{-0.00018}$ | $r_{0.002}$                 | 0.0143   | $< 0.0615$                   |
| $A_{143}^{PS}$              | 39.5     | $42^{+20}_{-20}$                | $Y_P^{BBN}$                 | 0.246676 | $0.24667^{+0.00017}_{-0.00018}$ | $r_{0.01}$                  | 0.0148   | $< 0.0625$                   |
| $A_{217}^{PS}$              | 98.1     | $101^{+30}_{-30}$               | $10^5 D/H$                  | 2.607    | $2.608^{+0.080}_{-0.077}$       | $\ln(10^{10} A_t)$          | -1.12    | $-0.8^{+1.5}_{-2.0}$         |
| $A_{217}^{CIB}$             | 43.7     | $41^{+10}_{-10}$                | Age/Gyr                     | 13.803   | $13.802^{+0.057}_{-0.057}$      | $r_{10}$                    | 0.0073   | $< 0.0318$                   |
| $A_{143}^{tSZ}$             | 3.97     | $< 7.36$                        | $z_*$                       | 1090.01  | $1090.00^{+0.60}_{-0.60}$       | $10^9 A_t$                  | 0.033    | $< 0.136$                    |
| $r_{143 \times 217}^{PS}$   | 0.561    | $0.64^{+0.25}_{-0.25}$          | $r_*$                       | 144.69   | $144.71^{+0.58}_{-0.58}$        | $10^9 A_t e^{-2\tau}$       | 0.029    | $< 0.121$                    |
| $r_{143 \times 217}^{CIB}$  | 0.66     | —                               | $100\theta_*$               | 1.04124  | $1.04124^{+0.00081}_{-0.00083}$ | $f_{2000}^{143}$            | 31.9     | $31^{+7}_{-6}$               |
| $\xi^{tSZ \times CIB}$      | 0.09     | —                               | $D_M(z_*)/\text{Gpc}$       | 13.896   | $13.898^{+0.057}_{-0.057}$      | $f_{2000}^{217}$            | 108.19   | $107.9^{+4.3}_{-4.2}$        |
| $A^{kSZ}$                   | 4.5      | —                               | $z_{drag}$                  | 1059.63  | $1059.62^{+0.96}_{-0.94}$       | $f_{2000}^{143 \times 217}$ | 33.55    | $33^{+5}_{-5}$               |
| $A_{100}^{dust}$            | 1.017    | $1.01^{+0.38}_{-0.38}$          | $r_{drag}$                  | 147.39   | $147.41^{+0.66}_{-0.66}$        | $\chi_{lensing}^2$          | 9.03     | $9.45 (\nu: 0.3)$            |
| $A_{143}^{dust}$            | 0.984    | $0.97^{+0.35}_{-0.35}$          | $k_D$                       | 0.14047  | $0.14044^{+0.00090}_{-0.00091}$ | $\chi_{BKPLANCK}^2$         | 735.56   | $739.8 (\nu: 3.5)$           |
| $A_{217}^{dust}$            | 0.960    | $0.97^{+0.20}_{-0.20}$          | $100\theta_D$               | 0.16095  | $0.16096^{+0.00056}_{-0.00056}$ | $\chi_{small}^2$            | 396.42   | $397.5 (\nu: 2.4)$           |
| $A_{143 \times 217}^{dust}$ | 1.006    | $1.03^{+0.32}_{-0.32}$          | $z_{eq}$                    | 3384     | $3382^{+51}_{-50}$              | $\chi_{lowl}^2$             | 22.43    | $23.2 (\nu: 2.1)$            |
| $c_{100}$                   | 0.99745  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{eq}$                    | 0.010328 | $0.01032^{+0.00016}_{-0.00015}$ | $\chi_{CamSpec}^2$          | 7051.2   | $7064.1 (\nu: 14.7)$         |
| $c_{217}$                   | 1.00137  | $1.0013^{+0.0030}_{-0.0031}$    | $100\theta_{eq}$            | 0.8164   | $0.8167^{+0.0093}_{-0.0092}$    | $\chi_{6DF}^2$              | 0.038    | $0.064 (\nu: 0.0)$           |
| $H_0$                       | 67.53    | $67.6^{+1.0}_{-0.98}$           | $100\theta_{s,eq}$          | 0.45107  | $0.4512^{+0.0048}_{-0.0048}$    | $\chi_{MGS}^2$              | 1.16     | $1.25 (\nu: 0.1)$            |
| $\Omega_\Lambda$            | 0.6881   | $0.688^{+0.013}_{-0.013}$       | $H(0.15)$                   | 72.81    | $72.84^{+0.87}_{-0.85}$         | $\chi_{DR12BAO}^2$          | 4.57     | $5.0 (\nu: 1.3)$             |
| $\Omega_m$                  | 0.3119   | $0.312^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | 641.9    | $641.8^{+8.5}_{-8.5}$           | $\chi_{prior}^2$            | 2.5      | $9.3 (\nu: 7.4)$             |
| $\Omega_m h^2$              | 0.14225  | $0.1422^{+0.0021}_{-0.0021}$    | $H(0.38)$                   | 82.93    | $82.95^{+0.68}_{-0.65}$         | $\chi_{CMB}^2$              | 8214.6   | $8234.1 (\nu: 19.7)$         |
| $\Omega_m h^3$              | 0.09606  | $0.09605^{+0.00095}_{-0.00095}$ | $D_M(0.38)$                 | 1530.9   | $1531^{+17}_{-17}$              | $\chi_{BAO}^2$              | 5.77     | $6.3 (\nu: 0.9)$             |

Best-fit  $\chi_{eff}^2 = 8222.87$ ;  $\bar{\chi}_{eff}^2 = 8249.75$ ;  $R - 1 = 0.00778$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.04 MGS: 1.16 DR12BAO: 4.57 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 9.03 BK15\_dust: 735.56 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.42 commander\_dx12\_v3.2.29: 22.43 CamSpec like\_10.7HM: 7051.18



### 11.13 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02216^{+0.00046}_{-0.00045}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09607^{+0.00097}_{-0.00095}$ | $H(0.38)$                       | $82.5^{+1.1}_{-1.1}$         |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1211^{+0.0041}_{-0.0040}$    | $\sigma_8$                           | $0.815^{+0.017}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$          | $1544^{+30}_{-31}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04081^{+0.00094}_{-0.00093}$ | $S_8$                                | $0.846^{+0.047}_{-0.046}$       | $H(0.51)$                       | $89.31^{+0.88}_{-0.82}$      |
| $\tau$                                     | $0.055^{+0.014}_{-0.013}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.463^{+0.026}_{-0.025}$       | $D_{\mathrm{M}}(0.51)$          | $1998^{+35}_{-36}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.048^{+0.032}_{-0.029}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.614^{+0.022}_{-0.022}$       | $H(0.61)$                       | $95.02^{+0.71}_{-0.66}$      |
| $n_{\mathrm{s}}$                           | $0.962^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$                   | $0.997^{+0.030}_{-0.030}$       | $D_{\mathrm{M}}(0.61)$          | $2324^{+38}_{-39}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.006^{+0.015}_{-0.015}$      | $r_{\mathrm{drag}}h$                 | $98.2^{+3.1}_{-3.0}$            | $H(2.33)$                       | $237.1^{+2.5}_{-2.5}$        |
| $r$  | $< 0.0631$                      | $\langle d^2 \rangle^{1/2}$          | $2.455^{+0.074}_{-0.072}$       | $D_{\mathrm{M}}(2.33)$          | $5776^{+32}_{-33}$           |
| $y_{\mathrm{cal}}$                         | $1.0007^{+0.0049}_{-0.0049}$    | $z_{\mathrm{re}}$                    | $< 9.13$                        | $f\sigma_8(0.15)$               | $0.467^{+0.023}_{-0.023}$    |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}}$                | $2.108^{+0.067}_{-0.062}$       | $\sigma_8(0.15)$                | $0.752^{+0.014}_{-0.013}$    |
| $A_{B,\mathrm{sync}}$                      | $< 3.66$                        | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.887^{+0.028}_{-0.028}$       | $f\sigma_8(0.38)$               | $0.483^{+0.018}_{-0.018}$    |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{40}$                             | $1230^{+42}_{-41}$              | $\sigma_8(0.38)$                | $0.665^{+0.012}_{-0.010}$    |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                            | $5703^{+82}_{-81}$              | $f\sigma_8(0.51)$               | $0.480^{+0.015}_{-0.016}$    |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{810}$                            | $2537^{+28}_{-28}$              | $\sigma_8(0.51)$                | $0.622^{+0.010}_{-0.0097}$   |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                           | $814^{+10}_{-10}$               | $f\sigma_8(0.61)$               | $0.474^{+0.014}_{-0.014}$    |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.35^{+0.53}_{-0.57}$         | $D_{2000}$                           | $229.1^{+3.9}_{-3.9}$           | $\sigma_8(0.61)$                | $0.5917^{+0.0096}_{-0.0090}$ |
| $A_{100}^{\mathrm{PS}}$                    | $246^{+50}_{-50}$               | $n_{\mathrm{s},0.002}$               | $0.980^{+0.047}_{-0.046}$       | $f\sigma_8(2.33)$               | $0.2979^{+0.0047}_{-0.0044}$ |
| $A_{143}^{\mathrm{PS}}$                    | $43^{+20}_{-20}$                | $Y_{\mathrm{P}}$                     | $0.24530^{+0.00018}_{-0.00021}$ | $\sigma_8(2.33)$                | $0.3066^{+0.0050}_{-0.0045}$ |
| $A_{217}^{\mathrm{PS}}$                    | $100^{+30}_{-30}$               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24663^{+0.00018}_{-0.00022}$ | $r_{0.002}$                     | $< 0.0599$                   |
| $A_{217}^{\mathrm{CIB}}$                   | $42^{+10}_{-10}$                | $10^5 \mathrm{D}/\mathrm{H}$         | $2.626^{+0.087}_{-0.085}$       | $r_{0.01}$                      | $< 0.0608$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.28$                        | $\mathrm{Age}/\mathrm{Gyr}$          | $13.826^{+0.071}_{-0.073}$      | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.9^{+1.5}_{-2.0}$         |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.64^{+0.25}_{-0.25}$          | $z_*$                                | $1090.28^{+0.81}_{-0.80}$       | $r_{10}$                        | $< 0.0311$                   |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | $r_*$                                | $144.32^{+0.95}_{-0.94}$        | $10^9 A_{\mathrm{t}}$           | $< 0.133$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $100\theta_*$                        | $1.04101^{+0.00093}_{-0.00091}$ | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.119$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.863^{+0.088}_{-0.087}$      | $f_{2000}^{143}$                | $32^{+7}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $z_{\mathrm{drag}}$                  | $1059.52^{+0.98}_{-0.97}$       | $f_{2000}^{217}$                | $108.3^{+4.3}_{-4.3}$        |
| $A_{143}^{\mathrm{dust}}$                  | $0.98^{+0.35}_{-0.34}$          | $r_{\mathrm{drag}}$                  | $147.04^{+0.97}_{-0.96}$        | $f_{2000}^{143 \times 217}$     | $34^{+5}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $k_{\mathrm{D}}$                     | $0.1408^{+0.0011}_{-0.0011}$    | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.2 (\nu: 3.7)$           |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.32}$          | $100\theta_{\mathrm{D}}$             | $0.16101^{+0.00057}_{-0.00056}$ | $\chi_{\mathrm{simall}}^2$      | $397.2 (\nu: 2.0)$           |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{eq}}$                    | $3423^{+93}_{-92}$              | $\chi_{\mathrm{lowl}}^2$        | $23.5 (\nu: 2.4)$            |
| $c_{217}$                                  | $1.0013^{+0.0031}_{-0.0031}$    | $k_{\mathrm{eq}}$                    | $0.01045^{+0.00028}_{-0.00028}$ | $\chi_{\mathrm{CamSpec}}^2$     | $7064.3 (\nu: 15.7)$         |
| $H_0$                                      | $66.8^{+1.8}_{-1.7}$            | $100\theta_{\mathrm{eq}}$            | $0.809^{+0.017}_{-0.017}$       | $\chi_{\mathrm{prior}}^2$       | $9.3 (\nu: 7.4)$             |
| $\Omega_{\Lambda}$                         | $0.677^{+0.025}_{-0.026}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4473^{+0.0089}_{-0.0086}$    | $\chi_{\mathrm{CMB}}^2$         | $8224.3 (\nu: 19.6)$         |
| $\Omega_{\mathrm{m}}$                      | $0.323^{+0.026}_{-0.025}$       | $H(0.15)$                            | $72.2^{+1.5}_{-1.5}$            |                                 |                              |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1439^{+0.0039}_{-0.0038}$    | $D_{\mathrm{M}}(0.15)$               | $649^{+15}_{-15}$               |                                 |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8233.63; R - 1 = 0.00394$$



## 11.14 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02226^{+0.00042}_{-0.00041}$ | $\sigma_8$                           | $0.810^{+0.015}_{-0.014}$       | $H(0.51)$                       | $89.68^{+0.60}_{-0.56}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1192^{+0.0024}_{-0.0023}$    | $S_8$                                | $0.824^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(0.51)$          | $1982^{+22}_{-22}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04106^{+0.00082}_{-0.00085}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.452^{+0.016}_{-0.016}$       | $H(0.61)$                       | $95.30^{+0.51}_{-0.49}$      |
| $\tau$                                     | $0.057^{+0.015}_{-0.014}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.016}_{-0.015}$       | $D_{\mathrm{M}}(0.61)$          | $2306^{+23}_{-24}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.047^{+0.033}_{-0.031}$       | $\sigma_8/h^{0.5}$                   | $0.985^{+0.023}_{-0.021}$       | $H(2.33)$                       | $235.9^{+1.6}_{-1.5}$        |
| $n_{\mathrm{s}}$                           | $0.9663^{+0.0089}_{-0.0089}$    | $r_{\mathrm{drag}}h$                 | $99.7^{+1.9}_{-1.8}$            | $D_{\mathrm{M}}(2.33)$          | $5764^{+24}_{-25}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.005^{+0.015}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$          | $2.427^{+0.055}_{-0.054}$       | $f\sigma_8(0.15)$               | $0.456^{+0.015}_{-0.015}$    |
| $r$  | $< 0.0659$                      | $z_{\mathrm{re}}$                    | $< 9.29$                        | $\sigma_8(0.15)$                | $0.748^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                         | $1.0008^{+0.0050}_{-0.0050}$    | $10^9 A_{\mathrm{s}}$                | $2.106^{+0.071}_{-0.065}$       | $f\sigma_8(0.38)$               | $0.475^{+0.013}_{-0.012}$    |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.024}_{-0.024}$       | $\sigma_8(0.38)$                | $0.663^{+0.011}_{-0.011}$    |
| $A_{B,\mathrm{sync}}$                      | $< 3.64$                        | $D_{40}$                             | $1223^{+40}_{-39}$              | $f\sigma_8(0.51)$               | $0.473^{+0.011}_{-0.011}$    |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{220}$                            | $5712^{+80}_{-80}$              | $\sigma_8(0.51)$                | $0.621^{+0.010}_{-0.0097}$   |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{810}$                            | $2537^{+27}_{-28}$              | $f\sigma_8(0.61)$               | $0.468^{+0.011}_{-0.0099}$   |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{1420}$                           | $815^{+10}_{-10}$               | $\sigma_8(0.61)$                | $0.5907^{+0.0099}_{-0.0092}$ |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                           | $229.5^{+3.8}_{-3.8}$           | $f\sigma_8(2.33)$               | $0.2979^{+0.0050}_{-0.0046}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.35^{+0.53}_{-0.59}$         | $n_{\mathrm{s},0.002}$               | $0.983^{+0.047}_{-0.046}$       | $\sigma_8(2.33)$                | $0.3071^{+0.0052}_{-0.0048}$ |
| $A_{100}^{\mathrm{PS}}$                    | $245^{+50}_{-50}$               | $Y_{\mathrm{P}}$                     | $0.24535^{+0.00016}_{-0.00019}$ | $r_{0.002}$                     | $< 0.0635$                   |
| $A_{143}^{\mathrm{PS}}$                    | $42^{+20}_{-20}$                | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24667^{+0.00016}_{-0.00019}$ | $r_{0.01}$                      | $< 0.0641$                   |
| $A_{217}^{\mathrm{PS}}$                    | $100^{+30}_{-30}$               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.606^{+0.079}_{-0.077}$       | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.8^{+1.5}_{-2.0}$         |
| $A_{217}^{\mathrm{CIB}}$                   | $42^{+10}_{-10}$                | Age/Gyr                              | $13.801^{+0.057}_{-0.058}$      | $r_{10}$                        | $< 0.0329$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.34$                        | $z_*$                                | $1089.99^{+0.60}_{-0.61}$       | $10^9 A_{\mathrm{t}}$           | $< 0.139$                    |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.64^{+0.25}_{-0.25}$          | $r_*$                                | $144.72^{+0.64}_{-0.64}$        | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.124$                    |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | $100\theta_*$                        | $1.04125^{+0.00081}_{-0.00084}$ | $f_{2000}^{143}$                | $31^{+7}_{-6}$               |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.899^{+0.062}_{-0.063}$      | $f_{2000}^{217}$                | $108.0^{+4.3}_{-4.2}$        |
| $A^{\mathrm{kSZ}}$                         | —                               | $z_{\mathrm{drag}}$                  | $1059.63^{+0.95}_{-0.95}$       | $f_{2000}^{143 \times 217}$     | $33^{+5}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $r_{\mathrm{drag}}$                  | $147.43^{+0.71}_{-0.72}$        | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.9 (\nu: 3.6)$           |
| $A_{143}^{\mathrm{dust}}$                  | $0.98^{+0.35}_{-0.34}$          | $k_{\mathrm{D}}$                     | $0.14043^{+0.00095}_{-0.00096}$ | $\chi_{\mathrm{simall}}^2$      | $397.5 (\nu: 2.6)$           |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.21}$          | $100\theta_{\mathrm{D}}$             | $0.16096^{+0.00056}_{-0.00056}$ | $\chi_{\mathrm{lowl}}^2$        | $22.9 (\nu: 1.8)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.33}$          | $z_{\mathrm{eq}}$                    | $3380^{+56}_{-55}$              | $\chi_{\mathrm{CamSpec}}^2$     | $7064.5 (\nu: 15.1)$         |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{eq}}$                    | $0.01032^{+0.00017}_{-0.00017}$ | $\chi_{6\mathrm{DF}}^2$         | $0.065 (\nu: 0.0)$           |
| $c_{217}$                                  | $1.0013^{+0.0030}_{-0.0031}$    | $100\theta_{\mathrm{eq}}$            | $0.817^{+0.010}_{-0.010}$       | $\chi_{\mathrm{MGS}}^2$         | $1.29 (\nu: 0.1)$            |
| $H_0$                                      | $67.6^{+1.1}_{-1.1}$            | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4514^{+0.0053}_{-0.0053}$    | $\chi_{\mathrm{DR12BAO}}^2$     | $4.9 (\nu: 1.5)$             |
| $\Omega_{\Lambda}$                         | $0.689^{+0.014}_{-0.015}$       | $H(0.15)$                            | $72.87^{+0.93}_{-0.91}$         | $\chi_{\mathrm{prior}}^2$       | $9.4 (\nu: 7.4)$             |
| $\Omega_{\mathrm{m}}$                      | $0.311^{+0.015}_{-0.014}$       | $D_{\mathrm{M}}(0.15)$               | $641.4^{+9.1}_{-9.1}$           | $\chi_{\mathrm{BAO}}^2$         | $6.3 (\nu: 1.0)$             |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1421^{+0.0024}_{-0.0023}$    | $H(0.38)$                            | $82.97^{+0.71}_{-0.68}$         | $\chi_{\mathrm{CMB}}^2$         | $8224.8 (\nu: 19.4)$         |
| $\Omega_{\mathrm{m}}h^3$                   | $0.09605^{+0.00097}_{-0.00096}$ | $D_{\mathrm{M}}(0.38)$               | $1530^{+18}_{-19}$              |                                 |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8240.52; R - 1 = 0.00672$$



# 11.15 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_lensing\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02218^{+0.00045}_{-0.00044}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09602^{+0.00095}_{-0.00094}$ | $H(0.38)$                       | $82.64^{+0.89}_{-0.84}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1204^{+0.0030}_{-0.0030}$    | $\sigma_8$                           | $0.812^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$          | $1539^{+23}_{-24}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04087^{+0.00089}_{-0.00089}$ | $S_8$                                | $0.837^{+0.032}_{-0.031}$       | $H(0.51)$                       | $89.43^{+0.73}_{-0.68}$      |
| $\tau$                                     | $0.055^{+0.014}_{-0.012}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.459^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.51)$          | $1993^{+27}_{-28}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.046^{+0.029}_{-0.027}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.610^{+0.015}_{-0.015}$       | $H(0.61)$                       | $95.10^{+0.61}_{-0.57}$      |
| $n_{\mathrm{s}}$                           | $0.963^{+0.010}_{-0.0097}$      | $\sigma_8/h^{0.5}$                   | $0.992^{+0.020}_{-0.020}$       | $D_{\mathrm{M}}(0.61)$          | $2318^{+29}_{-31}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.004^{+0.015}_{-0.015}$      | $r_{\mathrm{drag}}h$                 | $98.7^{+2.4}_{-2.3}$            | $H(2.33)$                       | $236.6^{+1.8}_{-1.9}$        |
| $r$  | $< 0.0628$                      | $\langle d^2 \rangle^{1/2}$          | $2.445^{+0.052}_{-0.051}$       | $D_{\mathrm{M}}(2.33)$          | $5773^{+28}_{-30}$           |
| $y_{\mathrm{cal}}$                         | $1.0006^{+0.0049}_{-0.0049}$    | $z_{\mathrm{re}}$                    | $< 9.03$                        | $f\sigma_8(0.15)$               | $0.463^{+0.016}_{-0.016}$    |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}}$                | $2.103^{+0.060}_{-0.056}$       | $\sigma_8(0.15)$                | $0.750^{+0.011}_{-0.0099}$   |
| $A_{B,\mathrm{sync}}$                      | $< 3.66$                        | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.884^{+0.023}_{-0.023}$       | $f\sigma_8(0.38)$               | $0.479^{+0.012}_{-0.012}$    |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{40}$                             | $1230^{+40}_{-40}$              | $\sigma_8(0.38)$                | $0.6640^{+0.0095}_{-0.0084}$ |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                            | $5706^{+82}_{-81}$              | $f\sigma_8(0.51)$               | $0.477^{+0.010}_{-0.010}$    |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{810}$                            | $2536^{+27}_{-27}$              | $\sigma_8(0.51)$                | $0.6211^{+0.0086}_{-0.0081}$ |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                           | $814^{+10}_{-10}$               | $f\sigma_8(0.61)$               | $0.4715^{+0.0092}_{-0.0091}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.35^{+0.53}_{-0.58}$         | $D_{2000}$                           | $229.2^{+3.9}_{-3.9}$           | $\sigma_8(0.61)$                | $0.5908^{+0.0082}_{-0.0077}$ |
| $A_{100}^{\mathrm{PS}}$                    | $245^{+50}_{-50}$               | $n_{\mathrm{s},0.002}$               | $0.977^{+0.046}_{-0.046}$       | $f\sigma_8(2.33)$               | $0.2976^{+0.0043}_{-0.0040}$ |
| $A_{143}^{\mathrm{PS}}$                    | $42^{+20}_{-20}$                | $Y_{\mathrm{P}}$                     | $0.24531^{+0.00018}_{-0.00021}$ | $\sigma_8(2.33)$                | $0.3065^{+0.0048}_{-0.0044}$ |
| $A_{217}^{\mathrm{PS}}$                    | $100^{+30}_{-30}$               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24664^{+0.00018}_{-0.00021}$ | $r_{0.002}$                     | $< 0.0595$                   |
| $A_{217}^{\mathrm{CIB}}$                   | $42^{+10}_{-10}$                | $10^5\mathrm{D}/\mathrm{H}$          | $2.621^{+0.084}_{-0.082}$       | $r_{0.01}$                      | $< 0.0605$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.32$                        | $\mathrm{Age}/\mathrm{Gyr}$          | $13.819^{+0.064}_{-0.067}$      | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.9^{+1.5}_{-2.0}$         |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.64^{+0.25}_{-0.25}$          | $z_{*}$                              | $1090.19^{+0.70}_{-0.71}$       | $r_{10}$                        | $< 0.0309$                   |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $r_{*}$                              | $144.47^{+0.73}_{-0.71}$        | $10^9 A_{\mathrm{t}}$           | $< 0.132$                    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $100\theta_{*}$                      | $1.04107^{+0.00087}_{-0.00087}$ | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.118$                    |
| $A^{\mathrm{kSZ}}$                         | —                               | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$ | $13.877^{+0.069}_{-0.068}$      | $f_{2000}^{143}$                | $32^{+7}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $z_{\mathrm{drag}}$                  | $1059.53^{+0.97}_{-0.97}$       | $f_{2000}^{217}$                | $108.1^{+4.3}_{-4.2}$        |
| $A_{143}^{\mathrm{dust}}$                  | $0.98^{+0.35}_{-0.34}$          | $r_{\mathrm{drag}}$                  | $147.20^{+0.77}_{-0.75}$        | $f_{2000}^{143\times 217}$      | $34^{+5}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $k_{\mathrm{D}}$                     | $0.14061^{+0.00094}_{-0.00095}$ | $\chi_{\mathrm{lensing}}^2$     | $9.70\ (\nu: 0.5)$           |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.32}$          | $100\theta_{\mathrm{D}}$             | $0.16100^{+0.00057}_{-0.00056}$ | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.5\ (\nu: 3.5)$          |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{eq}}$                    | $3407^{+68}_{-70}$              | $\chi_{\mathrm{simall}}^2$      | $397.1\ (\nu: 1.7)$          |
| $c_{217}$                                  | $1.0013^{+0.0031}_{-0.0031}$    | $k_{\mathrm{eq}}$                    | $0.01040^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{lowl}}^2$        | $23.6\ (\nu: 2.4)$           |
| $H_0$                                      | $67.1^{+1.4}_{-1.3}$            | $100\theta_{\mathrm{eq}}$            | $0.812^{+0.013}_{-0.012}$       | $\chi_{\mathrm{CamSpec}}^2$     | $7063.8\ (\nu: 14.7)$        |
| $\Omega_{\Lambda}$                         | $0.681^{+0.019}_{-0.019}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4488^{+0.0068}_{-0.0064}$    | $\chi_{\mathrm{prior}}^2$       | $9.3\ (\nu: 7.3)$            |
| $\Omega_{\mathrm{m}}$                      | $0.319^{+0.019}_{-0.019}$       | $H(0.15)$                            | $72.4^{+1.2}_{-1.1}$            | $\chi_{\mathrm{CMB}}^2$         | $8233.6\ (\nu: 19.5)$        |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1432^{+0.0028}_{-0.0029}$    | $D_{\mathrm{M}}(0.15)$               | $646^{+12}_{-12}$               |                                 |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 8242.90$ ;  $R - 1 = 0.00417$



## 11.16 base\_nrun\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_lensing\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                  | $0.02226^{+0.00042}_{-0.00042}$ | $\sigma_8$                            | $0.811^{+0.012}_{-0.011}$       | $H(0.51)$                        | $89.67^{+0.56}_{-0.54}$      |
| $\Omega_{\mathrm{c}} h^2$                  | $0.1193^{+0.0022}_{-0.0021}$    | $S_8$                                 | $0.826^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.51)$           | $1982^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04104^{+0.00082}_{-0.00084}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.452^{+0.013}_{-0.012}$       | $H(0.61)$                        | $95.28^{+0.49}_{-0.48}$      |
| $\tau$                                     | $0.057^{+0.015}_{-0.013}$       | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.61)$           | $2307^{+22}_{-22}$           |
| $\ln(10^{10} A_{\mathrm{s}})$              | $3.049^{+0.030}_{-0.029}$       | $\sigma_8/h^{0.5}$                    | $0.986^{+0.017}_{-0.017}$       | $H(2.33)$                        | $236.0^{+1.4}_{-1.4}$        |
| $n_{\mathrm{s}}$                           | $0.9661^{+0.0086}_{-0.0085}$    | $r_{\mathrm{drag}} h$                 | $99.6^{+1.6}_{-1.6}$            | $D_{\mathrm{M}}(2.33)$           | $5765^{+24}_{-25}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.004^{+0.015}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$           | $2.432^{+0.046}_{-0.045}$       | $f\sigma_8(0.15)$                | $0.457^{+0.012}_{-0.012}$    |
| $r$  | $< 0.0644$                      | $z_{\mathrm{re}}$                     | $8.0^{+1.4}_{-1.4}$             | $\sigma_8(0.15)$                 | $0.749^{+0.011}_{-0.010}$    |
| $y_{\mathrm{cal}}$                         | $1.0010^{+0.0050}_{-0.0049}$    | $10^9 A_{\mathrm{s}}$                 | $2.109^{+0.064}_{-0.060}$       | $f\sigma_8(0.38)$                | $0.4753^{+0.0098}_{-0.0096}$ |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.880^{+0.023}_{-0.022}$       | $\sigma_8(0.38)$                 | $0.664^{+0.010}_{-0.0088}$   |
| $A_{B,\mathrm{sync}}$                      | $< 3.65$                        | $D_{40}$                              | $1226^{+39}_{-39}$              | $f\sigma_8(0.51)$                | $0.4739^{+0.0087}_{-0.0085}$ |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{220}$                             | $5716^{+80}_{-80}$              | $\sigma_8(0.51)$                 | $0.6214^{+0.0095}_{-0.0083}$ |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{810}$                             | $2537^{+27}_{-27}$              | $f\sigma_8(0.61)$                | $0.4689^{+0.0080}_{-0.0078}$ |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{1420}$                            | $815^{+10}_{-10}$               | $\sigma_8(0.61)$                 | $0.5913^{+0.0087}_{-0.0082}$ |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                            | $229.7^{+3.8}_{-3.8}$           | $f\sigma_8(2.33)$                | $0.2981^{+0.0045}_{-0.0042}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.34^{+0.53}_{-0.58}$         | $n_{\mathrm{s},0.002}$                | $0.980^{+0.047}_{-0.046}$       | $\sigma_8(2.33)$                 | $0.3074^{+0.0048}_{-0.0045}$ |
| $A_{100}^{\mathrm{PS}}$                    | $245^{+50}_{-50}$               | $Y_{\mathrm{P}}$                      | $0.24535^{+0.00017}_{-0.00018}$ | $r_{0.002}$                      | $< 0.0615$                   |
| $A_{143}^{\mathrm{PS}}$                    | $42^{+20}_{-20}$                | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24667^{+0.00017}_{-0.00018}$ | $r_{0.01}$                       | $< 0.0625$                   |
| $A_{217}^{\mathrm{PS}}$                    | $101^{+30}_{-30}$               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.607^{+0.080}_{-0.077}$       | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.8^{+1.5}_{-2.0}$         |
| $A_{217}^{\mathrm{CIB}}$                   | $41^{+10}_{-10}$                | Age/Gyr                               | $13.802^{+0.056}_{-0.057}$      | $r_{10}$                         | $< 0.0318$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.37$                        | $z_*$                                 | $1090.00^{+0.59}_{-0.61}$       | $10^9 A_{\mathrm{t}}$            | $< 0.136$                    |
| $r_{143 \times 217}^{\mathrm{PS}}$         | $0.64^{+0.25}_{-0.25}$          | $r_*$                                 | $144.71^{+0.58}_{-0.58}$        | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.121$                    |
| $r_{143 \times 217}^{\mathrm{CIB}}$        | —                               | $100\theta_*$                         | $1.04124^{+0.00081}_{-0.00083}$ | $f_{2000}^{143}$                 | $31^{+7}_{-6}$               |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.898^{+0.057}_{-0.057}$      | $f_{2000}^{217}$                 | $107.9^{+4.3}_{-4.2}$        |
| $A^{\mathrm{kSZ}}$                         | —                               | $z_{\mathrm{drag}}$                   | $1059.62^{+0.96}_{-0.95}$       | $f_{2000}^{143 \times 217}$      | $33^{+5}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $r_{\mathrm{drag}}$                   | $147.41^{+0.66}_{-0.66}$        | $\chi_{\mathrm{lensing}}^2$      | $9.42 (\nu: 0.2)$            |
| $A_{143}^{\mathrm{dust}}$                  | $0.97^{+0.35}_{-0.34}$          | $k_{\mathrm{D}}$                      | $0.14044^{+0.00090}_{-0.00091}$ | $\chi_{\mathrm{BKPLANCK}}^2$     | $739.8 (\nu: 3.5)$           |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $100\theta_{\mathrm{D}}$              | $0.16096^{+0.00056}_{-0.00055}$ | $\chi_{\mathrm{simall}}^2$       | $397.5 (\nu: 2.4)$           |
| $A_{143 \times 217}^{\mathrm{dust}}$       | $1.03^{+0.32}_{-0.32}$          | $z_{\mathrm{eq}}$                     | $3382^{+51}_{-50}$              | $\chi_{\mathrm{lowl}}^2$         | $23.2 (\nu: 2.0)$            |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{eq}}$                     | $0.01032^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{CamSpec}}^2$      | $7064.1 (\nu: 14.7)$         |
| $c_{217}$                                  | $1.0013^{+0.0030}_{-0.0031}$    | $100\theta_{\mathrm{eq}}$             | $0.8168^{+0.0092}_{-0.0092}$    | $\chi_{6\mathrm{DF}}^2$          | $0.062 (\nu: 0.0)$           |
| $H_0$                                      | $67.57^{+0.99}_{-0.97}$         | $100\theta_{\mathrm{s,eq}}$           | $0.4513^{+0.0048}_{-0.0047}$    | $\chi_{\mathrm{MGS}}^2$          | $1.26 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                         | $0.689^{+0.013}_{-0.013}$       | $H(0.15)$                             | $72.85^{+0.87}_{-0.84}$         | $\chi_{\mathrm{DR12BAO}}^2$      | $4.9 (\nu: 1.3)$             |
| $\Omega_{\mathrm{m}}$                      | $0.311^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$                | $641.7^{+8.4}_{-8.4}$           | $\chi_{\mathrm{prior}}^2$        | $9.3 (\nu: 7.4)$             |
| $\Omega_{\mathrm{m}} h^2$                  | $0.1422^{+0.0021}_{-0.0021}$    | $H(0.38)$                             | $82.95^{+0.68}_{-0.65}$         | $\chi_{\mathrm{CMB}}^2$          | $8234.0 (\nu: 19.6)$         |
| $\Omega_{\mathrm{m}} h^3$                  | $0.09605^{+0.00095}_{-0.00095}$ | $D_{\mathrm{M}}(0.38)$                | $1530^{+17}_{-17}$              | $\chi_{\mathrm{BAO}}^2$          | $6.3 (\nu: 0.8)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8249.63; R - 1 = 0.00812$$



# 11.17 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022290 | $0.02230^{+0.00032}_{-0.00031}$ | $\Omega_m$                  | 0.3158   | $0.315^{+0.017}_{-0.016}$       | $H(0.15)$                   | 72.60    | $72.6^{+1.0}_{-1.0}$         |
| $\Omega_c h^2$              | 0.11998  | $0.1198^{+0.0027}_{-0.0027}$    | $\Omega_m h^2$              | 0.14292  | $0.1428^{+0.0026}_{-0.0026}$    | $D_M(0.15)$                 | 644.2    | $644^{+10}_{-10}$            |
| $100\theta_{MC}$            | 1.04085  | $1.04085^{+0.00060}_{-0.00061}$ | $\Omega_m h^3$              | 0.09614  | $0.09613^{+0.00065}_{-0.00064}$ | $H(0.38)$                   | 82.78    | $82.82^{+0.75}_{-0.72}$      |
| $\tau$                      | 0.0542   | $0.054^{+0.017}_{-0.015}$       | $\sigma_8$                  | 0.8105   | $0.810^{+0.015}_{-0.015}$       | $D_M(0.38)$                 | 1535.2   | $1534^{+20}_{-20}$           |
| $\ln(10^{10} A_s)$          | 3.0437   | $3.043^{+0.035}_{-0.032}$       | $S_8$                       | 0.8316   | $0.830^{+0.032}_{-0.032}$       | $H(0.51)$                   | 89.55    | $89.57^{+0.59}_{-0.57}$      |
| $n_s$                       | 0.9649   | $0.9652^{+0.0093}_{-0.0093}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4555   | $0.455^{+0.017}_{-0.017}$       | $D_M(0.51)$                 | 1988.1   | $1987^{+24}_{-24}$           |
| $dn_s/d \ln k$              | -0.0032  | $-0.004^{+0.014}_{-0.014}$      | $\sigma_8 \Omega_m^{0.25}$  | 0.6076   | $0.607^{+0.016}_{-0.016}$       | $H(0.61)$                   | 95.198   | $95.22^{+0.48}_{-0.46}$      |
| $r$                         | 0.0243   | $< 0.0730$                      | $\sigma_8/h^{0.5}$          | 0.9882   | $0.987^{+0.023}_{-0.023}$       | $D_M(0.61)$                 | 2312.9   | $2312^{+25}_{-26}$           |
| $y_{cal}$                   | 1.00074  | $1.0007^{+0.0049}_{-0.0048}$    | $r_{drag} h$                | 99.01    | $99.1^{+2.1}_{-2.1}$            | $H(2.33)$                   | 236.46   | $236.4^{+1.7}_{-1.7}$        |
| $A_{B,dust}$                | 4.60     | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$ | 2.438    | $2.434^{+0.057}_{-0.057}$       | $D_M(2.33)$                 | 5768.0   | $5767^{+21}_{-22}$           |
| $A_{B,sync}$                | 1.38     | $< 3.64$                        | $z_{re}$                    | 7.69     | $7.7^{+1.6}_{-1.6}$             | $f\sigma_8(0.15)$           | 0.4597   | $0.459^{+0.016}_{-0.016}$    |
| $\alpha_{B,dust}$           | -0.52    | —                               | $10^9 A_s$                  | 2.098    | $2.098^{+0.074}_{-0.067}$       | $\sigma_8(0.15)$            | 0.7485   | $0.748^{+0.013}_{-0.013}$    |
| $\beta_{B,dust}$            | 1.584    | $1.60^{+0.19}_{-0.19}$          | $10^9 A_s e^{-2\tau}$       | 1.8826   | $1.882^{+0.024}_{-0.024}$       | $f\sigma_8(0.38)$           | 0.4771   | $0.476^{+0.013}_{-0.013}$    |
| $\alpha_{B,sync}$           | -0.42    | —                               | $D_{40}$                    | 1229.4   | $1230^{+37}_{-36}$              | $\sigma_8(0.38)$            | 0.6630   | $0.663^{+0.011}_{-0.011}$    |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.56}$         | $D_{220}$                   | 5717     | $5715^{+78}_{-76}$              | $f\sigma_8(0.51)$           | 0.4752   | $0.474^{+0.012}_{-0.012}$    |
| $\epsilon_{dust,sync}$      | -0.37    | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                   | 2537.8   | $2537^{+27}_{-26}$              | $\sigma_8(0.51)$            | 0.6203   | $0.620^{+0.011}_{-0.010}$    |
| $A_{100}^{PS}$              | 237.1    | $242^{+50}_{-50}$               | $D_{1420}$                  | 815.6    | $815.3^{+9.9}_{-9.7}$           | $f\sigma_8(0.61)$           | 0.4699   | $0.469^{+0.011}_{-0.011}$    |
| $A_{143}^{PS}$              | 40.4     | $41^{+20}_{-20}$                | $D_{2000}$                  | 230.00   | $229.9^{+3.7}_{-3.6}$           | $\sigma_8(0.61)$            | 0.5901   | $0.590^{+0.010}_{-0.0095}$   |
| $A_{217}^{PS}$              | 100.9    | $102^{+30}_{-30}$               | $n_{s,0.002}$               | 0.9751   | $0.977^{+0.042}_{-0.042}$       | $f\sigma_8(2.33)$           | 0.29736  | $0.2972^{+0.0051}_{-0.0048}$ |
| $A_{217}^{CIB}$             | 45.6     | $40^{+10}_{-10}$                | $Y_P$                       | 0.245363 | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$            | 0.3064   | $0.3063^{+0.0053}_{-0.0050}$ |
| $A_{143}^{tSZ}$             | 6.54     | $< 7.41$                        | $Y_P^{BBN}$                 | 0.246689 | $0.24669^{+0.00012}_{-0.00013}$ | $r_{0.002}$                 | 0.0222   | $< 0.0693$                   |
| $r_{143 \times 217}^{PS}$   | 0.578    | $0.65^{+0.25}_{-0.25}$          | $10^5 D/H$                  | 2.601    | $2.599^{+0.060}_{-0.059}$       | $r_{0.01}$                  | 0.0231   | $< 0.0705$                   |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | Age/Gyr                     | 13.8078  | $13.806^{+0.048}_{-0.048}$      | $\ln(10^{10} A_t)$          | -0.68    | $-0.6^{+1.4}_{-1.8}$         |
| $\xi^{tSZ \times CIB}$      | 0.05     | —                               | $z_*$                       | 1090.02  | $1090.00^{+0.55}_{-0.55}$       | $r_{10}$                    | 0.0114   | $< 0.0359$                   |
| $A^{kSZ}$                   | 0.1      | —                               | $r_*$                       | 144.50   | $144.53^{+0.64}_{-0.63}$        | $10^9 A_t$                  | 0.051    | $< 0.153$                    |
| $A_{100}^{dust}$            | 1.009    | $1.01^{+0.38}_{-0.38}$          | $100\theta_*$               | 1.04104  | $1.04104^{+0.00059}_{-0.00060}$ | $10^9 A_t e^{-2\tau}$       | 0.046    | $< 0.137$                    |
| $A_{143}^{dust}$            | 0.974    | $0.96^{+0.34}_{-0.35}$          | $D_M(z_*)/\text{Gpc}$       | 13.880   | $13.883^{+0.060}_{-0.059}$      | $f_{2000}^{143}$            | 30.8     | $30^{+6}_{-6}$               |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.20}_{-0.20}$          | $z_{drag}$                  | 1059.74  | $1059.76^{+0.67}_{-0.67}$       | $f_{2000}^{217}$            | 107.36   | $107.4^{+4.2}_{-4.2}$        |
| $A_{143 \times 217}^{dust}$ | 1.000    | $1.03^{+0.32}_{-0.32}$          | $r_{drag}$                  | 147.19   | $147.21^{+0.65}_{-0.65}$        | $f_{2000}^{143 \times 217}$ | 32.69    | $33^{+5}_{-5}$               |
| $c_{100}$                   | 0.99764  | $0.9975^{+0.0021}_{-0.0021}$    | $k_D$                       | 0.14071  | $0.14068^{+0.00073}_{-0.00074}$ | $\chi_{BKPLANCK}^2$         | 735.3    | $740.0 (\nu: 3.8)$           |
| $c_{217}$                   | 1.00138  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_D$               | 0.160858 | $0.16085^{+0.00040}_{-0.00040}$ | $\chi_{small}^2$            | 396.13   | $397.2 (\nu: 1.8)$           |
| $c_{TE}$                    | 0.9962   | $0.9963^{+0.0097}_{-0.0096}$    | $z_{eq}$                    | 3400     | $3397^{+62}_{-62}$              | $\chi_{lowl}^2$             | 23.09    | $23.5 (\nu: 1.9)$            |
| $c_{EE}$                    | 0.9919   | $0.9919^{+0.0097}_{-0.0096}$    | $k_{eq}$                    | 0.010377 | $0.01037^{+0.00019}_{-0.00019}$ | $\chi_{CamSpec}^2$          | 11499.2  | $11514.7 (\nu: 17.3)$        |
| $H_0$                       | 67.27    | $67.3^{+1.2}_{-1.2}$            | $100\theta_{eq}$            | 0.8134   | $0.814^{+0.012}_{-0.012}$       | $\chi_{prior}^2$            | 2.4      | $9.5 (\nu: 7.2)$             |
| $\Omega_\Lambda$            | 0.6842   | $0.685^{+0.016}_{-0.017}$       | $100\theta_{s,eq}$          | 0.4495   | $0.4498^{+0.0060}_{-0.0059}$    | $\chi_{CMB}^2$              | 12653.8  | $12675.4 (\nu: 21.3)$        |

Best-fit  $\chi_{eff}^2 = 12656.13$ ;  $\bar{\chi}_{eff}^2 = 12684.91$ ;  $R - 1 = 0.00385$

$\chi_{eff}^2$ : CMB - BK15\_dust: 735.31 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.13 commander\_dx12\_v3\_2\_29: 23.09 CamSpec like\_10.7HM\_1400\_unified: 11499.22



# 11.18 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_BAO

| Parameter                   | Best fit             | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------------------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022346             | $0.02234^{+0.00030}_{-0.00029}$ | $\Omega_m h^3$              | 0.09617  | $0.09612^{+0.00064}_{-0.00065}$ | $H(0.51)$                   | 89.724   | $89.73^{+0.46}_{-0.45}$      |
| $\Omega_c h^2$              | 0.11919              | $0.1191^{+0.0020}_{-0.0020}$    | $\sigma_8$                  | 0.8078   | $0.808^{+0.015}_{-0.014}$       | $D_M(0.51)$                 | 1980.7   | $1980^{+18}_{-18}$           |
| $100\theta_{MC}$            | 1.04099              | $1.04094^{+0.00056}_{-0.00058}$ | $S_8$                       | 0.8221   | $0.821^{+0.025}_{-0.025}$       | $H(0.61)$                   | 95.338   | $95.34^{+0.38}_{-0.37}$      |
| $\tau$                      | 0.0546               | $0.055^{+0.017}_{-0.015}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4503   | $0.450^{+0.014}_{-0.014}$       | $D_M(0.61)$                 | 2304.9   | $2304^{+19}_{-19}$           |
| $\ln(10^{10} A_s)$          | 3.0419               | $3.043^{+0.035}_{-0.033}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6031   | $0.603^{+0.014}_{-0.014}$       | $H(2.33)$                   | 236.01   | $235.9^{+1.3}_{-1.2}$        |
| $n_s$                       | 0.9669               | $0.9671^{+0.0083}_{-0.0083}$    | $\sigma_8/h^{0.5}$          | 0.9822   | $0.982^{+0.021}_{-0.020}$       | $D_M(2.33)$                 | 5762.0   | $5762^{+18}_{-18}$           |
| $dn_s/d \ln k$              | $-277 \cdot 10^{-5}$ | $-0.003^{+0.014}_{-0.014}$      | $r_{drag} h$                | 99.65    | $99.7^{+1.5}_{-1.5}$            | $f\sigma_8(0.15)$           | 0.4549   | $0.455^{+0.013}_{-0.013}$    |
| $r$                         | 0.0247               | $< 0.0743$                      | $\langle d^2 \rangle^{1/2}$ | 2.424    | $2.423^{+0.052}_{-0.051}$       | $\sigma_8(0.15)$            | 0.7465   | $0.747^{+0.013}_{-0.013}$    |
| $y_{cal}$                   | 1.00050              | $1.0007^{+0.0048}_{-0.0048}$    | $z_{re}$                    | 7.70     | $7.7^{+1.6}_{-1.6}$             | $f\sigma_8(0.38)$           | 0.4734   | $0.473^{+0.011}_{-0.011}$    |
| $A_{B,dust}$                | 4.62                 | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.095    | $2.098^{+0.074}_{-0.067}$       | $\sigma_8(0.38)$            | 0.6618   | $0.662^{+0.011}_{-0.011}$    |
| $A_{B,sync}$                | 1.37                 | $< 3.64$                        | $10^9 A_s e^{-2\tau}$       | 1.8780   | $1.878^{+0.022}_{-0.022}$       | $f\sigma_8(0.51)$           | 0.4721   | $0.472^{+0.010}_{-0.010}$    |
| $\alpha_{B,dust}$           | -0.50                | —                               | $D_{40}$                    | 1225.4   | $1228^{+36}_{-36}$              | $\sigma_8(0.51)$            | 0.6193   | $0.619^{+0.011}_{-0.010}$    |
| $\beta_{B,dust}$            | 1.583                | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5717     | $5719^{+77}_{-76}$              | $f\sigma_8(0.61)$           | 0.4672   | $0.4670^{+0.0097}_{-0.0096}$ |
| $\alpha_{B,sync}$           | -0.48                | —                               | $D_{810}$                   | 2535.9   | $2536^{+27}_{-26}$              | $\sigma_8(0.61)$            | 0.5893   | $0.589^{+0.010}_{-0.0095}$   |
| $\beta_{B,sync}$            | -3.05                | $-3.10^{+0.51}_{-0.56}$         | $D_{1420}$                  | 815.8    | $815.8^{+9.9}_{-9.7}$           | $f\sigma_8(2.33)$           | 0.29718  | $0.2973^{+0.0051}_{-0.0048}$ |
| $\epsilon_{dust,sync}$      | -0.38                | $-0.36^{+0.53}_{-0.58}$         | $D_{2000}$                  | 230.16   | $230.1^{+3.7}_{-3.6}$           | $\sigma_8(2.33)$            | 0.3064   | $0.3065^{+0.0053}_{-0.0049}$ |
| $A_{100}^{PS}$              | 235.9                | $241^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9759   | $0.978^{+0.043}_{-0.042}$       | $r_{0.002}$                 | 0.0228   | $< 0.0709$                   |
| $A_{143}^{PS}$              | 40.8                 | $40^{+20}_{-20}$                | $Y_P$                       | 0.245386 | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | 0.0236   | $< 0.0721$                   |
| $A_{217}^{PS}$              | 101.3                | $102^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246712 | $0.24671^{+0.00011}_{-0.00012}$ | $\ln(10^{10} A_t)$          | -0.66    | $-0.6^{+1.4}_{-1.8}$         |
| $A_{217}^{CIB}$             | 44.9                 | $40^{+20}_{-10}$                | $10^5 D/H$                  | 2.590    | $2.591^{+0.056}_{-0.054}$       | $r_{10}$                    | 0.0117   | $< 0.0366$                   |
| $A_{143}^{tSZ}$             | 6.46                 | $< 7.45$                        | Age/Gyr                     | 13.7946  | $13.795^{+0.041}_{-0.041}$      | $10^9 A_t$                  | 0.052    | $< 0.156$                    |
| $r_{143 \times 217}^{PS}$   | 0.592                | $0.65^{+0.26}_{-0.25}$          | $z_*$                       | 1089.879 | $1089.87^{+0.46}_{-0.46}$       | $10^9 A_t e^{-2\tau}$       | 0.046    | $< 0.139$                    |
| $r_{143 \times 217}^{CIB}$  | 0.80                 | —                               | $r_*$                       | 144.66   | $144.70^{+0.50}_{-0.51}$        | $f_{2000}^{143}$            | 30.6     | $30^{+6}_{-6}$               |
| $\xi^{tSZ \times CIB}$      | 0.12                 | —                               | $100\theta_*$               | 1.04117  | $1.04113^{+0.00055}_{-0.00057}$ | $f_{2000}^{217}$            | 107.16   | $107.2^{+4.2}_{-4.3}$        |
| $A^{kSZ}$                   | 0.3                  | —                               | $D_M(z_*)/Gpc$              | 13.8938  | $13.898^{+0.048}_{-0.048}$      | $f_{2000}^{143 \times 217}$ | 32.51    | $32^{+5}_{-5}$               |
| $A_{100}^{dust}$            | 1.008                | $1.01^{+0.38}_{-0.38}$          | $z_{drag}$                  | 1059.82  | $1059.81^{+0.66}_{-0.64}$       | $\chi_{BKPLANCK}^2$         | 735.7    | $740.2 (\nu: 3.7)$           |
| $A_{143}^{dust}$            | 0.977                | $0.96^{+0.35}_{-0.35}$          | $r_{drag}$                  | 147.33   | $147.37^{+0.54}_{-0.54}$        | $\chi_{small}^2$            | 396.13   | $397.3 (\nu: 2.0)$           |
| $A_{217}^{dust}$            | 0.968                | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | 0.14059  | $0.14055^{+0.00068}_{-0.00067}$ | $\chi_{lowl}^2$             | 22.83    | $23.3 (\nu: 1.8)$            |
| $A_{143 \times 217}^{dust}$ | 0.998                | $1.02^{+0.31}_{-0.31}$          | $100\theta_D$               | 0.160829 | $0.16083^{+0.00039}_{-0.00039}$ | $\chi_{CamSpec}^2$          | 11499.5  | $11514.5 (\nu: 16.9)$        |
| $c_{100}$                   | 0.99760              | $0.9975^{+0.0021}_{-0.0021}$    | $z_{eq}$                    | 3382.3   | $3379^{+47}_{-46}$              | $\chi_{6DF}^2$              | 0.029    | $0.050 (\nu: 0.0)$           |
| $c_{217}$                   | 1.00137              | $1.0012^{+0.0031}_{-0.0031}$    | $k_{eq}$                    | 0.010323 | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{MGS}^2$              | 1.22     | $1.32 (\nu: 0.1)$            |
| $c_{TE}$                    | 0.9965               | $0.9965^{+0.0096}_{-0.0096}$    | $100\theta_{eq}$            | 0.8168   | $0.8174^{+0.0086}_{-0.0086}$    | $\chi_{DR12BAO}^2$          | 4.40     | $4.7 (\nu: 0.9)$             |
| $c_{EE}$                    | 0.9921               | $0.9923^{+0.0098}_{-0.0094}$    | $100\theta_{s,eq}$          | 0.45125  | $0.4516^{+0.0044}_{-0.0045}$    | $\chi_{prior}^2$            | 2.4      | $9.5 (\nu: 7.2)$             |
| $H_0$                       | 67.64                | $67.67^{+0.89}_{-0.88}$         | $H(0.15)$                   | 72.91    | $72.94^{+0.76}_{-0.75}$         | $\chi_{BAO}^2$              | 5.64     | $6.1 (\nu: 0.6)$             |
| $\Omega_\Lambda$            | 0.6892               | $0.690^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | 641.0    | $640.7^{+7.5}_{-7.5}$           | $\chi_{CMB}^2$              | 12654.2  | $12675.4 (\nu: 20.8)$        |
| $\Omega_m$                  | 0.3108               | $0.310^{+0.012}_{-0.012}$       | $H(0.38)$                   | 83.01    | $83.03^{+0.57}_{-0.56}$         |                             |          |                              |
| $\Omega_m h^2$              | 0.14218              | $0.1420^{+0.0020}_{-0.0019}$    | $D_M(0.38)$                 | 1528.9   | $1528^{+15}_{-15}$              |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12662.16$ ;  $\bar{\chi}_{eff}^2 = 12690.95$ ;  $R - 1 = 0.00720$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.03 MGS: 1.22 DR12BAO: 4.40 CMB - BK15\_dust: 735.68 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.13 commander\_dx12\_v3\_2\_29: 22.83 CamSpec like\_10.7HM\_1400\_unified: 11499.52



### 11.19 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022287 | $0.02230^{+0.00032}_{-0.00031}$ | $\Omega_m h^2$              | 0.14282  | $0.1428^{+0.0023}_{-0.0023}$    | $H(0.38)$                   | 82.80    | $82.83^{+0.69}_{-0.66}$      |
| $\Omega_c h^2$              | 0.11988  | $0.1198^{+0.0024}_{-0.0024}$    | $\Omega_m h^3$              | 0.09611  | $0.09613^{+0.00064}_{-0.00064}$ | $D_M(0.38)$                 | 1534.8   | $1534^{+18}_{-19}$           |
| $100\theta_{MC}$            | 1.04084  | $1.04085^{+0.00059}_{-0.00060}$ | $\sigma_8$                  | 0.8099   | $0.810^{+0.012}_{-0.012}$       | $H(0.51)$                   | 89.55    | $89.58^{+0.55}_{-0.52}$      |
| $\tau$                      | 0.0536   | $0.055^{+0.016}_{-0.014}$       | $S_8$                       | 0.8303   | $0.830^{+0.025}_{-0.025}$       | $D_M(0.51)$                 | 1987.5   | $1987^{+21}_{-22}$           |
| $\ln(10^{10} A_s)$          | 3.0420   | $3.044^{+0.031}_{-0.029}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4548   | $0.455^{+0.014}_{-0.014}$       | $H(0.61)$                   | 95.203   | $95.22^{+0.45}_{-0.43}$      |
| $n_s$                       | 0.9652   | $0.9652^{+0.0089}_{-0.0087}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6069   | $0.607^{+0.012}_{-0.013}$       | $D_M(0.61)$                 | 2312.3   | $2311^{+23}_{-24}$           |
| $dn_s/d \ln k$              | -0.0018  | $-0.003^{+0.014}_{-0.014}$      | $\sigma_8/h^{0.5}$          | 0.9872   | $0.987^{+0.018}_{-0.018}$       | $H(2.33)$                   | 236.39   | $236.4^{+1.5}_{-1.5}$        |
| $r$                         | 0.0215   | $< 0.0710$                      | $r_{drag} h$                | 99.07    | $99.1^{+1.9}_{-1.8}$            | $D_M(2.33)$                 | 5768.0   | $5767^{+20}_{-21}$           |
| $y_{cal}$                   | 1.00078  | $1.0007^{+0.0048}_{-0.0048}$    | $\langle d^2 \rangle^{1/2}$ | 2.4375   | $2.436^{+0.045}_{-0.046}$       | $f\sigma_8(0.15)$           | 0.4591   | $0.459^{+0.013}_{-0.013}$    |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $z_{re}$                    | 7.62     | $7.7^{+1.5}_{-1.5}$             | $\sigma_8(0.15)$            | 0.7480   | $0.748^{+0.011}_{-0.011}$    |
| $A_{B,sync}$                | 1.42     | $< 3.64$                        | $10^9 A_s$                  | 2.095    | $2.099^{+0.066}_{-0.060}$       | $f\sigma_8(0.38)$           | 0.4765   | $0.476^{+0.010}_{-0.010}$    |
| $\alpha_{B,dust}$           | -0.51    | —                               | $10^9 A_s e^{-2\tau}$       | 1.8820   | $1.882^{+0.022}_{-0.022}$       | $\sigma_8(0.38)$            | 0.6626   | $0.6629^{+0.0096}_{-0.0093}$ |
| $\beta_{B,dust}$            | 1.583    | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                    | 1231.2   | $1233^{+37}_{-36}$              | $f\sigma_8(0.51)$           | 0.4747   | $0.4747^{+0.0089}_{-0.0090}$ |
| $\alpha_{B,sync}$           | -0.38    | —                               | $D_{220}$                   | 5720     | $5718^{+77}_{-76}$              | $\sigma_8(0.51)$            | 0.6199   | $0.6202^{+0.0090}_{-0.0087}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.56}$         | $D_{810}$                   | 2537.8   | $2537^{+26}_{-26}$              | $f\sigma_8(0.61)$           | 0.4694   | $0.4694^{+0.0082}_{-0.0082}$ |
| $\epsilon_{dust,sync}$      | -0.36    | $-0.36^{+0.52}_{-0.58}$         | $D_{1420}$                  | 816.0    | $815.5^{+9.9}_{-9.7}$           | $\sigma_8(0.61)$            | 0.5898   | $0.5901^{+0.0086}_{-0.0083}$ |
| $A_{100}^{PS}$              | 237.0    | $242^{+50}_{-50}$               | $D_{2000}$                  | 230.20   | $230.0^{+3.7}_{-3.6}$           | $f\sigma_8(2.33)$           | 0.29722  | $0.2974^{+0.0045}_{-0.0043}$ |
| $A_{143}^{PS}$              | 42.9     | $40^{+20}_{-20}$                | $n_{s,0.002}$               | 0.9710   | $0.975^{+0.042}_{-0.041}$       | $\sigma_8(2.33)$            | 0.30626  | $0.3065^{+0.0049}_{-0.0046}$ |
| $A_{217}^{PS}$              | 102.2    | $102^{+30}_{-30}$               | $Y_P$                       | 0.245362 | $0.24536^{+0.00012}_{-0.00013}$ | $r_{0.002}$                 | 0.0196   | $< 0.0675$                   |
| $A_{217}^{CIB}$             | 43.6     | $40^{+20}_{-10}$                | $Y_P^{BBN}$                 | 0.246688 | $0.24669^{+0.00012}_{-0.00013}$ | $r_{0.01}$                  | 0.0205   | $< 0.0687$                   |
| $A_{143}^{tSZ}$             | 5.77     | $< 7.42$                        | $10^5 D/H$                  | 2.601    | $2.599^{+0.059}_{-0.058}$       | $\ln(10^{10} A_t)$          | -0.80    | $-0.7^{+1.4}_{-1.9}$         |
| $r_{143 \times 217}^{PS}$   | 0.630    | $0.65^{+0.25}_{-0.25}$          | Age/Gyr                     | 13.8078  | $13.806^{+0.046}_{-0.047}$      | $r_{10}$                    | 0.0100   | $< 0.0350$                   |
| $r_{143 \times 217}^{CIB}$  | 0.77     | —                               | $z_*$                       | 1090.02  | $1089.99^{+0.52}_{-0.52}$       | $10^9 A_t$                  | 0.045    | $< 0.149$                    |
| $\xi^{tSZ \times CIB}$      | 0.31     | —                               | $r_*$                       | 144.52   | $144.53^{+0.56}_{-0.55}$        | $10^9 A_t e^{-2\tau}$       | 0.040    | $< 0.134$                    |
| $A^{kSZ}$                   | 1.3      | —                               | $100\theta_*$               | 1.04103  | $1.04104^{+0.00058}_{-0.00059}$ | $f_{2000}^{143}$            | 30.5     | $30^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.013    | $1.01^{+0.38}_{-0.38}$          | $D_M(z_*)/\text{Gpc}$       | 13.883   | $13.884^{+0.053}_{-0.052}$      | $f_{2000}^{217}$            | 107.19   | $107.3^{+4.2}_{-4.2}$        |
| $A_{143}^{dust}$            | 0.973    | $0.96^{+0.34}_{-0.35}$          | $z_{drag}$                  | 1059.74  | $1059.76^{+0.67}_{-0.66}$       | $f_{2000}^{143 \times 217}$ | 32.49    | $33^{+5}_{-5}$               |
| $A_{217}^{dust}$            | 0.970    | $0.97^{+0.20}_{-0.20}$          | $r_{drag}$                  | 147.21   | $147.22^{+0.58}_{-0.57}$        | $\chi_{lensing}^2$          | 8.90     | $9.39 (\nu: 0.2)$            |
| $A_{143 \times 217}^{dust}$ | 1.004    | $1.02^{+0.31}_{-0.31}$          | $k_D$                       | 0.14067  | $0.14068^{+0.00068}_{-0.00069}$ | $\chi_{BKPLANCK}^2$         | 735.38   | $739.9 (\nu: 3.7)$           |
| $c_{100}$                   | 0.99766  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_D$               | 0.160865 | $0.16085^{+0.00039}_{-0.00039}$ | $\chi_{small}^2$            | 396.03   | $397.2 (\nu: 1.5)$           |
| $c_{217}$                   | 1.00131  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{eq}$                    | 3397     | $3396^{+54}_{-55}$              | $\chi_{lowl}^2$             | 23.34    | $23.7 (\nu: 2.0)$            |
| $c_{TE}$                    | 0.9964   | $0.9963^{+0.0097}_{-0.0096}$    | $k_{eq}$                    | 0.010369 | $0.01037^{+0.00017}_{-0.00017}$ | $\chi_{CamSpec}^2$          | 11499.2  | $11514.2 (\nu: 16.4)$        |
| $c_{EE}$                    | 0.9920   | $0.9920^{+0.0097}_{-0.0095}$    | $100\theta_{eq}$            | 0.8139   | $0.814^{+0.010}_{-0.010}$       | $\chi_{prior}^2$            | 2.3      | $9.5 (\nu: 7.2)$             |
| $H_0$                       | 67.30    | $67.3^{+1.1}_{-1.1}$            | $100\theta_{s,eq}$          | 0.4497   | $0.4499^{+0.0054}_{-0.0052}$    | $\chi_{CMB}^2$              | 12662.8  | $12684.4 (\nu: 21.2)$        |
| $\Omega_\Lambda$            | 0.6847   | $0.685^{+0.015}_{-0.015}$       | $H(0.15)$                   | 72.62    | $72.66^{+0.93}_{-0.91}$         |                             |          |                              |
| $\Omega_m$                  | 0.3153   | $0.315^{+0.015}_{-0.015}$       | $D_M(0.15)$                 | 643.9    | $643.6^{+9.2}_{-9.2}$           |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 12665.09$ ;  $\bar{\chi}_{\text{eff}}^2 = 12693.83$ ;  $R - 1 = 0.00535$   
 $\chi_{\text{eff}}^2$ : CMB - smicadx12.Dec5.ftl\_mv2.ndclpp-p.teb\_consext8: 8.90 BK15\_dust: 735.38 small.100x143\_offlike5.EE\_Aplanck\_B: 396.03 commander\_dx12.v3.2.29: 23.34  
CamSpec like\_10.7HM.1400\_unified: 11499.17



# 11.20 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_BAO\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022335 | $0.02234^{+0.00030}_{-0.00029}$ | $\Omega_m h^3$              | 0.09612  | $0.09613^{+0.00063}_{-0.00064}$ | $H(0.51)$                   | 89.703   | $89.71^{+0.45}_{-0.43}$      |
| $\Omega_c h^2$              | 0.11917  | $0.1191^{+0.0019}_{-0.0019}$    | $\sigma_8$                  | 0.8088   | $0.809^{+0.012}_{-0.012}$       | $D_M(0.51)$                 | 1981.2   | $1981^{+17}_{-17}$           |
| $100\theta_{MC}$            | 1.04092  | $1.04093^{+0.00056}_{-0.00057}$ | $S_8$                       | 0.8234   | $0.824^{+0.021}_{-0.021}$       | $H(0.61)$                   | 95.317   | $95.33^{+0.38}_{-0.37}$      |
| $\tau$                      | 0.0558   | $0.056^{+0.016}_{-0.014}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4510   | $0.451^{+0.011}_{-0.011}$       | $D_M(0.61)$                 | 2305.5   | $2305^{+18}_{-19}$           |
| $\ln(10^{10} A_s)$          | 3.0452   | $3.046^{+0.031}_{-0.029}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6040   | $0.604^{+0.011}_{-0.011}$       | $H(2.33)$                   | 235.98   | $236.0^{+1.2}_{-1.2}$        |
| $n_s$                       | 0.9667   | $0.9668^{+0.0081}_{-0.0081}$    | $\sigma_8/h^{0.5}$          | 0.9836   | $0.984^{+0.016}_{-0.016}$       | $D_M(2.33)$                 | 5763.2   | $5763^{+18}_{-18}$           |
| $dn_s/d \ln k$              | -0.0031  | $-0.003^{+0.014}_{-0.014}$      | $r_{drag} h$                | 99.64    | $99.7^{+1.5}_{-1.4}$            | $f\sigma_8(0.15)$           | 0.4556   | $0.456^{+0.011}_{-0.011}$    |
| $r$                         | 0.0248   | $< 0.0725$                      | $\langle d^2 \rangle^{1/2}$ | 2.4278   | $2.429^{+0.044}_{-0.043}$       | $\sigma_8(0.15)$            | 0.7475   | $0.748^{+0.011}_{-0.011}$    |
| $y_{cal}$                   | 1.00077  | $1.0009^{+0.0048}_{-0.0048}$    | $z_{re}$                    | 7.83     | $7.9^{+1.5}_{-1.4}$             | $f\sigma_8(0.38)$           | 0.4741   | $0.4743^{+0.0090}_{-0.0090}$ |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.102    | $2.104^{+0.065}_{-0.060}$       | $\sigma_8(0.38)$            | 0.6626   | $0.6630^{+0.0097}_{-0.0093}$ |
| $A_{B,sync}$                | 1.40     | $< 3.64$                        | $10^9 A_s e^{-2\tau}$       | 1.8795   | $1.879^{+0.021}_{-0.021}$       | $f\sigma_8(0.51)$           | 0.4727   | $0.4729^{+0.0082}_{-0.0082}$ |
| $\alpha_{B,dust}$           | -0.52    | —                               | $D_{40}$                    | 1226.4   | $1231^{+36}_{-36}$              | $\sigma_8(0.51)$            | 0.6201   | $0.6205^{+0.0092}_{-0.0087}$ |
| $\beta_{B,dust}$            | 1.584    | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5722     | $5723^{+76}_{-75}$              | $f\sigma_8(0.61)$           | 0.4678   | $0.4680^{+0.0077}_{-0.0076}$ |
| $\alpha_{B,sync}$           | -0.35    | —                               | $D_{810}$                   | 2537.6   | $2538^{+26}_{-26}$              | $\sigma_8(0.61)$            | 0.5901   | $0.5905^{+0.0087}_{-0.0083}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.51}_{-0.56}$         | $D_{1420}$                  | 816.1    | $816.2^{+9.8}_{-9.8}$           | $f\sigma_8(2.33)$           | 0.29756  | $0.2977^{+0.0045}_{-0.0042}$ |
| $\epsilon_{dust,sync}$      | -0.37    | $-0.36^{+0.53}_{-0.57}$         | $D_{2000}$                  | 230.19   | $230.3^{+3.6}_{-3.6}$           | $\sigma_8(2.33)$            | 0.30679  | $0.3070^{+0.0048}_{-0.0045}$ |
| $A_{100}^{PS}$              | 235.9    | $241^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9768   | $0.976^{+0.042}_{-0.042}$       | $r_{0.002}$                 | 0.0229   | $< 0.0690$                   |
| $A_{143}^{PS}$              | 39.2     | $40^{+20}_{-20}$                | $Y_P$                       | 0.245382 | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | 0.0238   | $< 0.0702$                   |
| $A_{217}^{PS}$              | 101.7    | $102^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246708 | $0.24671^{+0.00011}_{-0.00012}$ | $\ln(10^{10} A_t)$          | -0.65    | $-0.6^{+1.4}_{-1.9}$         |
| $A_{217}^{CIB}$             | 45.2     | $40^{+20}_{-10}$                | $10^5 D/H$                  | 2.592    | $2.591^{+0.056}_{-0.055}$       | $r_{10}$                    | 0.0117   | $< 0.0356$                   |
| $A_{143}^{tSZ}$             | 6.65     | $< 7.48$                        | Age/Gyr                     | 13.7974  | $13.796^{+0.041}_{-0.041}$      | $10^9 A_t$                  | 0.052    | $< 0.152$                    |
| $r_{143 \times 217}^{PS}$   | 0.577    | $0.65^{+0.26}_{-0.25}$          | $z_*$                       | 1089.890 | $1089.88^{+0.45}_{-0.45}$       | $10^9 A_t e^{-2\tau}$       | 0.047    | $< 0.136$                    |
| $r_{143 \times 217}^{CIB}$  | 0.77     | —                               | $r_*$                       | 144.673  | $144.67^{+0.47}_{-0.47}$        | $f_{2000}^{143}$            | 30.5     | $30^{+6}_{-6}$               |
| $\xi^{tSZ \times CIB}$      | 0.02     | —                               | $100\theta_*$               | 1.04111  | $1.04112^{+0.00055}_{-0.00057}$ | $f_{2000}^{217}$            | 107.22   | $107.1^{+4.2}_{-4.2}$        |
| $A^{kSZ}$                   | 0.0      | —                               | $D_M(z_*)/\text{Gpc}$       | 13.8960  | $13.896^{+0.045}_{-0.045}$      | $f_{2000}^{143 \times 217}$ | 32.47    | $32^{+5}_{-5}$               |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | $z_{drag}$                  | 1059.78  | $1059.81^{+0.66}_{-0.64}$       | $\chi_{lensing}^2$          | 8.97     | $9.34 (\nu: 0.2)$            |
| $A_{143}^{dust}$            | 0.967    | $0.96^{+0.35}_{-0.34}$          | $r_{drag}$                  | 147.35   | $147.35^{+0.51}_{-0.51}$        | $\chi_{BKPLANCK}^2$         | 735.57   | $740.1 (\nu: 3.6)$           |
| $A_{217}^{dust}$            | 0.967    | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | 0.14057  | $0.14057^{+0.00066}_{-0.00065}$ | $\chi_{small}^2$            | 396.36   | $397.4 (\nu: 1.9)$           |
| $A_{143 \times 217}^{dust}$ | 1.004    | $1.02^{+0.31}_{-0.31}$          | $100\theta_D$               | 0.160834 | $0.16083^{+0.00039}_{-0.00039}$ | $\chi_{lowl}^2$             | 22.82    | $23.5 (\nu: 1.9)$            |
| $c_{100}$                   | 0.99771  | $0.9976^{+0.0021}_{-0.0021}$    | $z_{eq}$                    | 3381.5   | $3381^{+43}_{-43}$              | $\chi_{CamSpec}^2$          | 11499.5  | $11514.0 (\nu: 16.3)$        |
| $c_{217}$                   | 1.00132  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{eq}$                    | 0.010321 | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{6DF}^2$              | 0.030    | $0.051 (\nu: 0.0)$           |
| $c_{TE}$                    | 0.9964   | $0.9964^{+0.0096}_{-0.0096}$    | $100\theta_{eq}$            | 0.8169   | $0.8170^{+0.0081}_{-0.0079}$    | $\chi_{MGS}^2$              | 1.22     | $1.27 (\nu: 0.1)$            |
| $c_{EE}$                    | 0.9925   | $0.9923^{+0.0097}_{-0.0094}$    | $100\theta_{s,eq}$          | 0.45130  | $0.4513^{+0.0042}_{-0.0041}$    | $\chi_{DR12BAO}^2$          | 4.43     | $4.8 (\nu: 0.9)$             |
| $H_0$                       | 67.62    | $67.63^{+0.85}_{-0.83}$         | $H(0.15)$                   | 72.89    | $72.91^{+0.74}_{-0.71}$         | $\chi_{prior}^2$            | 2.2      | $9.4 (\nu: 7.3)$             |
| $\Omega_\Lambda$            | 0.6891   | $0.689^{+0.011}_{-0.011}$       | $D_M(0.15)$                 | 641.2    | $641.1^{+7.1}_{-7.2}$           | $\chi_{CMB}^2$              | 12663.2  | $12684.4 (\nu: 20.9)$        |
| $\Omega_m$                  | 0.3109   | $0.311^{+0.011}_{-0.011}$       | $H(0.38)$                   | 82.99    | $83.01^{+0.55}_{-0.53}$         | $\chi_{BAO}^2$              | 5.68     | $6.1 (\nu: 0.5)$             |
| $\Omega_m h^2$              | 0.14215  | $0.1421^{+0.0018}_{-0.0018}$    | $D_M(0.38)$                 | 1529.3   | $1529^{+14}_{-15}$              |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12671.14$ ;  $\bar{\chi}_{eff}^2 = 12699.90$ ;  $R - 1 = 0.00769$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.03 MGS: 1.22 DR12BAO: 4.43 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.96 BK15\_dust: 735.57 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.36 commander\_dx12\_v3.2.29: 22.82 CamSpec like\_10.7HM\_1400\_unified: 11499.49



# 11.21 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02230^{+0.00032}_{-0.00031}$ | $\Omega_{\mathrm{m}}$                | $0.315^{+0.017}_{-0.016}$       | $H(0.15)$                       | $72.7^{+1.0}_{-1.0}$         |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1198^{+0.0027}_{-0.0027}$    | $\Omega_{\mathrm{m}}h^2$             | $0.1428^{+0.0026}_{-0.0026}$    | $D_{\mathrm{M}}(0.15)$          | $644^{+10}_{-10}$            |
| $100\theta_{\mathrm{MC}}$                  | $1.04085^{+0.00060}_{-0.00061}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09614^{+0.00065}_{-0.00064}$ | $H(0.38)$                       | $82.83^{+0.75}_{-0.72}$      |
| $\tau$                                     | $0.055^{+0.014}_{-0.012}$       | $\sigma_8$                           | $0.811^{+0.015}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$          | $1534^{+20}_{-20}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.045^{+0.030}_{-0.028}$       | $S_8$                                | $0.830^{+0.032}_{-0.031}$       | $H(0.51)$                       | $89.58^{+0.59}_{-0.57}$      |
| $n_{\mathrm{s}}$                           | $0.9653^{+0.0093}_{-0.0093}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.455^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.51)$          | $1987^{+24}_{-24}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.004^{+0.014}_{-0.014}$      | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.016}_{-0.016}$       | $H(0.61)$                       | $95.23^{+0.48}_{-0.45}$      |
| $r$  | $< 0.0730$                      | $\sigma_8/h^{0.5}$                   | $0.988^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.61)$          | $2311^{+25}_{-26}$           |
| $y_{\mathrm{cal}}$                         | $1.0007^{+0.0049}_{-0.0048}$    | $r_{\mathrm{drag}}h$                 | $99.1^{+2.1}_{-2.1}$            | $H(2.33)$                       | $236.4^{+1.7}_{-1.7}$        |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$          | $2.436^{+0.056}_{-0.055}$       | $D_{\mathrm{M}}(2.33)$          | $5767^{+21}_{-22}$           |
| $A_{B,\mathrm{sync}}$                      | $< 3.65$                        | $z_{\mathrm{re}}$                    | $< 9.05$                        | $f\sigma_8(0.15)$               | $0.459^{+0.016}_{-0.016}$    |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $10^9 A_{\mathrm{s}}$                | $2.102^{+0.064}_{-0.059}$       | $\sigma_8(0.15)$                | $0.749^{+0.013}_{-0.012}$    |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.882^{+0.024}_{-0.024}$       | $f\sigma_8(0.38)$               | $0.477^{+0.013}_{-0.013}$    |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{40}$                             | $1230^{+37}_{-36}$              | $\sigma_8(0.38)$                | $0.663^{+0.010}_{-0.0098}$   |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.52}_{-0.56}$         | $D_{220}$                            | $5715^{+78}_{-76}$              | $f\sigma_8(0.51)$               | $0.475^{+0.011}_{-0.011}$    |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                            | $2537^{+27}_{-26}$              | $\sigma_8(0.51)$                | $0.6206^{+0.0095}_{-0.0090}$ |
| $A_{100}^{\mathrm{PS}}$                    | $242^{+50}_{-50}$               | $D_{1420}$                           | $815.2^{+9.9}_{-9.7}$           | $f\sigma_8(0.61)$               | $0.470^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{PS}}$                    | $41^{+20}_{-20}$                | $D_{2000}$                           | $229.9^{+3.7}_{-3.6}$           | $\sigma_8(0.61)$                | $0.5904^{+0.0089}_{-0.0084}$ |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $n_{\mathrm{s},0.002}$               | $0.978^{+0.042}_{-0.042}$       | $f\sigma_8(2.33)$               | $0.2975^{+0.0045}_{-0.0042}$ |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+10}_{-10}$                | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$                | $0.3066^{+0.0047}_{-0.0043}$ |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.41$                        | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00013}$ | $r_{0.002}$                     | $< 0.0695$                   |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.65^{+0.25}_{-0.25}$          | $10^5\mathrm{D}/\mathrm{H}$          | $2.599^{+0.060}_{-0.059}$       | $r_{0.01}$                      | $< 0.0706$                   |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.805^{+0.048}_{-0.048}$      | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.6^{+1.4}_{-1.8}$         |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $z_*$                                | $1089.99^{+0.55}_{-0.55}$       | $r_{10}$                        | $< 0.0360$                   |
| $A^{\mathrm{kSZ}}$                         | —                               | $r_*$                                | $144.53^{+0.64}_{-0.63}$        | $10^9 A_{\mathrm{t}}$           | $< 0.153$                    |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $100\theta_*$                        | $1.04104^{+0.00059}_{-0.00060}$ | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.137$                    |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.34}_{-0.35}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.883^{+0.060}_{-0.059}$      | $f_{2000}^{143}$                | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $z_{\mathrm{drag}}$                  | $1059.77^{+0.66}_{-0.67}$       | $f_{2000}^{217}$                | $107.4^{+4.2}_{-4.2}$        |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.03^{+0.32}_{-0.32}$          | $r_{\mathrm{drag}}$                  | $147.21^{+0.65}_{-0.64}$        | $f_{2000}^{143\times 217}$      | $33^{+5}_{-5}$               |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{D}}$                     | $0.14069^{+0.00073}_{-0.00074}$ | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.9 (\nu: 3.8)$           |
| $c_{217}$                                  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{\mathrm{D}}$             | $0.16085^{+0.00039}_{-0.00040}$ | $\chi_{\mathrm{simall}}^2$      | $397.2 (\nu: 1.8)$           |
| $c_{TE}$                                   | $0.9962^{+0.0097}_{-0.0096}$    | $z_{\mathrm{eq}}$                    | $3396^{+62}_{-62}$              | $\chi_{\mathrm{lowl}}^2$        | $23.5 (\nu: 1.9)$            |
| $c_{EE}$                                   | $0.9919^{+0.0097}_{-0.0095}$    | $k_{\mathrm{eq}}$                    | $0.01037^{+0.00019}_{-0.00019}$ | $\chi_{\mathrm{CamSpec}}^2$     | $11514.6 (\nu: 17.2)$        |
| $H_0$                                      | $67.3^{+1.2}_{-1.2}$            | $100\theta_{\mathrm{eq}}$            | $0.814^{+0.012}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$       | $9.5 (\nu: 7.2)$             |
| $\Omega_{\Lambda}$                         | $0.685^{+0.016}_{-0.017}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4499^{+0.0060}_{-0.0059}$    | $\chi_{\mathrm{CMB}}^2$         | $12675.2 (\nu: 20.9)$        |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12684.69; R - 1 = 0.00378$$



## 11.22 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_BAO\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02235^{+0.00030}_{-0.00029}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09613^{+0.00064}_{-0.00064}$ | $H(0.51)$                       | $89.74^{+0.46}_{-0.45}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1190^{+0.0020}_{-0.0020}$    | $\sigma_8$                           | $0.808^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.51)$          | $1980^{+18}_{-18}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04095^{+0.00056}_{-0.00058}$ | $S_8$                                | $0.822^{+0.025}_{-0.025}$       | $H(0.61)$                       | $95.34^{+0.38}_{-0.37}$      |
| $\tau$                                     | $0.056^{+0.014}_{-0.013}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.61)$          | $2304^{+19}_{-19}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.045^{+0.031}_{-0.029}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.014}_{-0.013}$       | $H(2.33)$                       | $235.9^{+1.3}_{-1.2}$        |
| $n_{\mathrm{s}}$                           | $0.9672^{+0.0083}_{-0.0082}$    | $\sigma_8/h^{0.5}$                   | $0.983^{+0.020}_{-0.019}$       | $D_{\mathrm{M}}(2.33)$          | $5762^{+18}_{-18}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.003^{+0.014}_{-0.014}$      | $r_{\mathrm{drag}}h$                 | $99.7^{+1.5}_{-1.5}$            | $f\sigma_8(0.15)$               | $0.455^{+0.013}_{-0.013}$    |
| $r$  | $< 0.0743$                      | $\langle d^2 \rangle^{1/2}$          | $2.425^{+0.051}_{-0.048}$       | $\sigma_8(0.15)$                | $0.747^{+0.012}_{-0.012}$    |
| $y_{\mathrm{cal}}$                         | $1.0007^{+0.0048}_{-0.0048}$    | $z_{\mathrm{re}}$                    | $< 9.11$                        | $f\sigma_8(0.38)$               | $0.474^{+0.011}_{-0.011}$    |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}}$                | $2.102^{+0.065}_{-0.060}$       | $\sigma_8(0.38)$                | $0.662^{+0.010}_{-0.0098}$   |
| $A_{B,\mathrm{sync}}$                      | $< 3.64$                        | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.022}_{-0.022}$       | $f\sigma_8(0.51)$               | $0.472^{+0.010}_{-0.0096}$   |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{40}$                             | $1228^{+36}_{-36}$              | $\sigma_8(0.51)$                | $0.6200^{+0.0096}_{-0.0090}$ |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                            | $5719^{+77}_{-76}$              | $f\sigma_8(0.61)$               | $0.4674^{+0.0094}_{-0.0088}$ |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{810}$                            | $2536^{+27}_{-26}$              | $\sigma_8(0.61)$                | $0.5900^{+0.0091}_{-0.0085}$ |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.51}_{-0.56}$         | $D_{1420}$                           | $815.8^{+9.9}_{-9.7}$           | $f\sigma_8(2.33)$               | $0.2976^{+0.0045}_{-0.0042}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.36^{+0.53}_{-0.58}$         | $D_{2000}$                           | $230.1^{+3.7}_{-3.6}$           | $\sigma_8(2.33)$                | $0.3068^{+0.0047}_{-0.0044}$ |
| $A_{100}^{\mathrm{PS}}$                    | $241^{+50}_{-50}$               | $n_{\mathrm{s},0.002}$               | $0.978^{+0.043}_{-0.042}$       | $r_{0.002}$                     | $< 0.0710$                   |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $Y_{\mathrm{P}}$                     | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                      | $< 0.0721$                   |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24671^{+0.00011}_{-0.00012}$ | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.6^{+1.4}_{-1.8}$         |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+20}_{-10}$                | $10^5\mathrm{D}/\mathrm{H}$          | $2.591^{+0.056}_{-0.054}$       | $r_{10}$                        | $< 0.0366$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.45$                        | $\mathrm{Age}/\mathrm{Gyr}$          | $13.795^{+0.041}_{-0.041}$      | $10^9 A_{\mathrm{t}}$           | $< 0.156$                    |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.65^{+0.26}_{-0.25}$          | $z_{*}$                              | $1089.87^{+0.46}_{-0.46}$       | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.139$                    |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $r_{*}$                              | $144.70^{+0.50}_{-0.51}$        | $f_{2000}^{143}$                | $30^{+6}_{-6}$               |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $100\theta_{*}$                      | $1.04113^{+0.00055}_{-0.00057}$ | $f_{2000}^{217}$                | $107.2^{+4.3}_{-4.2}$        |
| $A^{\mathrm{kSZ}}$                         | —                               | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$ | $13.898^{+0.048}_{-0.048}$      | $f_{2000}^{143\times 217}$      | $32^{+5}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $z_{\mathrm{drag}}$                  | $1059.81^{+0.66}_{-0.64}$       | $\chi_{\mathrm{BKPLANCK}}^2$    | $740.2\ (\nu: 3.7)$          |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.35}_{-0.35}$          | $r_{\mathrm{drag}}$                  | $147.37^{+0.54}_{-0.54}$        | $\chi_{\mathrm{simall}}^2$      | $397.3\ (\nu: 2.1)$          |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $k_{\mathrm{D}}$                     | $0.14055^{+0.00068}_{-0.00067}$ | $\chi_{\mathrm{lowl}}^2$        | $23.3\ (\nu: 1.7)$           |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.02^{+0.31}_{-0.31}$          | $100\theta_{\mathrm{D}}$             | $0.16083^{+0.00039}_{-0.00039}$ | $\chi_{\mathrm{CamSpec}}^2$     | $11514.4\ (\nu: 16.9)$       |
| $c_{100}$                                  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{eq}}$                    | $3379^{+46}_{-46}$              | $\chi_{6\mathrm{DF}}^2$         | $0.049\ (\nu: 0.0)$          |
| $c_{217}$                                  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{eq}}$                    | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{MGS}}^2$         | $1.32\ (\nu: 0.1)$           |
| $c_{TE}$                                   | $0.9964^{+0.0095}_{-0.0096}$    | $100\theta_{\mathrm{eq}}$            | $0.8175^{+0.0086}_{-0.0086}$    | $\chi_{\mathrm{DR12BAO}}^2$     | $4.7\ (\nu: 0.9)$            |
| $c_{EE}$                                   | $0.9923^{+0.0098}_{-0.0094}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4516^{+0.0044}_{-0.0044}$    | $\chi_{\mathrm{prior}}^2$       | $9.5\ (\nu: 7.3)$            |
| $H_0$                                      | $67.68^{+0.88}_{-0.88}$         | $H(0.15)$                            | $72.95^{+0.76}_{-0.75}$         | $\chi_{\mathrm{BAO}}^2$         | $6.1\ (\nu: 0.6)$            |
| $\Omega_{\Lambda}$                         | $0.690^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.15)$               | $640.7^{+7.5}_{-7.5}$           | $\chi_{\mathrm{CMB}}^2$         | $12675.2\ (\nu: 20.5)$       |
| $\Omega_{\mathrm{m}}$                      | $0.310^{+0.012}_{-0.012}$       | $H(0.38)$                            | $83.03^{+0.57}_{-0.55}$         |                                 |                              |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1420^{+0.0019}_{-0.0019}$    | $D_{\mathrm{M}}(0.38)$               | $1528^{+15}_{-15}$              |                                 |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12690.74; R - 1 = 0.00701$$



### 11.23 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02230^{+0.00032}_{-0.00031}$ | $\Omega_m h^2$              | $0.1427^{+0.0022}_{-0.0023}$    | $H(0.38)$                   | $82.84^{+0.68}_{-0.65}$      |
| $\Omega_c h^2$                       | $0.1198^{+0.0023}_{-0.0024}$    | $\Omega_m h^3$              | $0.09613^{+0.00064}_{-0.00064}$ | $D_M(0.38)$                 | $1534^{+18}_{-18}$           |
| $100\theta_{MC}$                     | $1.04085^{+0.00059}_{-0.00060}$ | $\sigma_8$                  | $0.811^{+0.012}_{-0.011}$       | $H(0.51)$                   | $89.59^{+0.54}_{-0.51}$      |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $S_8$                       | $0.830^{+0.025}_{-0.025}$       | $D_M(0.51)$                 | $1986^{+21}_{-22}$           |
| $\ln(10^{10} A_s)$                   | $3.046^{+0.028}_{-0.026}$       | $\sigma_8 \Omega_m^{0.5}$   | $0.455^{+0.014}_{-0.014}$       | $H(0.61)$                   | $95.23^{+0.44}_{-0.42}$      |
| $n_s$                                | $0.9653^{+0.0089}_{-0.0087}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.607^{+0.012}_{-0.012}$       | $D_M(0.61)$                 | $2311^{+23}_{-23}$           |
| $dn_s/d \ln k$                       | $-0.003^{+0.014}_{-0.014}$      | $\sigma_8/h^{0.5}$          | $0.988^{+0.017}_{-0.017}$       | $H(2.33)$                   | $236.3^{+1.4}_{-1.5}$        |
| $r$                                  | $< 0.0711$                      | $r_{\text{drag}} h$         | $99.2^{+1.9}_{-1.8}$            | $D_M(2.33)$                 | $5767^{+20}_{-21}$           |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0048}$    | $\langle d^2 \rangle^{1/2}$ | $2.437^{+0.045}_{-0.045}$       | $f\sigma_8(0.15)$           | $0.459^{+0.013}_{-0.013}$    |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $z_{\text{re}}$             | $< 9.00$                        | $\sigma_8(0.15)$            | $0.749^{+0.010}_{-0.0094}$   |
| $A_{B,\text{sync}}$                  | $< 3.64$                        | $10^9 A_s$                  | $2.102^{+0.058}_{-0.054}$       | $f\sigma_8(0.38)$           | $0.477^{+0.010}_{-0.010}$    |
| $\alpha_{B,\text{dust}}$             | —                               | $10^9 A_s e^{-2\tau}$       | $1.881^{+0.022}_{-0.022}$       | $\sigma_8(0.38)$            | $0.6634^{+0.0088}_{-0.0084}$ |
| $\beta_{B,\text{dust}}$              | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                    | $1232^{+37}_{-36}$              | $f\sigma_8(0.51)$           | $0.4748^{+0.0088}_{-0.0088}$ |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{220}$                   | $5718^{+77}_{-76}$              | $\sigma_8(0.51)$            | $0.6207^{+0.0083}_{-0.0078}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.56}$         | $D_{810}$                   | $2537^{+26}_{-26}$              | $f\sigma_8(0.61)$           | $0.4696^{+0.0080}_{-0.0079}$ |
| $\epsilon_{\text{dust,sync}}$        | $-0.36^{+0.52}_{-0.57}$         | $D_{1420}$                  | $815.5^{+9.9}_{-9.7}$           | $\sigma_8(0.61)$            | $0.5905^{+0.0079}_{-0.0074}$ |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{2000}$                  | $230.0^{+3.7}_{-3.6}$           | $f\sigma_8(2.33)$           | $0.2976^{+0.0041}_{-0.0038}$ |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $n_{s,0.002}$               | $0.975^{+0.042}_{-0.042}$       | $\sigma_8(2.33)$            | $0.3067^{+0.0044}_{-0.0041}$ |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $Y_P$                       | $0.24537^{+0.00012}_{-0.00013}$ | $r_{0.002}$                 | $< 0.0676$                   |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $Y_P^{\text{BBN}}$          | $0.24669^{+0.00012}_{-0.00013}$ | $r_{0.01}$                  | $< 0.0688$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.43$                        | $10^5 D/H$                  | $2.599^{+0.059}_{-0.058}$       | $\ln(10^{10} A_t)$          | $-0.6^{+1.4}_{-1.9}$         |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | Age/Gyr                     | $13.805^{+0.046}_{-0.046}$      | $r_{10}$                    | $< 0.0350$                   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $z_*$                       | $1089.98^{+0.51}_{-0.52}$       | $10^9 A_t$                  | $< 0.150$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $r_*$                       | $144.54^{+0.56}_{-0.55}$        | $10^9 A_t e^{-2\tau}$       | $< 0.134$                    |
| $A^{\text{kSZ}}$                     | —                               | $100\theta_*$               | $1.04104^{+0.00058}_{-0.00059}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $D_M(z_*)/\text{Gpc}$       | $13.885^{+0.052}_{-0.051}$      | $f_{2000}^{217}$            | $107.3^{+4.2}_{-4.2}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_{\text{drag}}$           | $1059.76^{+0.66}_{-0.67}$       | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-5}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_{\text{drag}}$           | $147.23^{+0.57}_{-0.57}$        | $\chi_{\text{lensing}}^2$   | $9.37 (\nu: 0.2)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.31}$          | $k_D$                       | $0.14067^{+0.00068}_{-0.00069}$ | $\chi_{\text{BKPLANCK}}^2$  | $739.9 (\nu: 3.7)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_D$               | $0.16085^{+0.00039}_{-0.00039}$ | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\text{eq}}$             | $3395^{+53}_{-54}$              | $\chi_{\text{lowl}}^2$      | $23.7 (\nu: 2.0)$            |
| $c_{TE}$                             | $0.9962^{+0.0097}_{-0.0095}$    | $k_{\text{eq}}$             | $0.01036^{+0.00016}_{-0.00017}$ | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 16.3)$        |
| $c_{EE}$                             | $0.9920^{+0.0097}_{-0.0094}$    | $100\theta_{\text{eq}}$     | $0.814^{+0.010}_{-0.0099}$      | $\chi_{\text{prior}}^2$     | $9.5 (\nu: 7.2)$             |
| $H_0$                                | $67.4^{+1.1}_{-1.0}$            | $100\theta_{s,\text{eq}}$   | $0.4500^{+0.0053}_{-0.0051}$    | $\chi_{\text{CMB}}^2$       | $12684.2 (\nu: 20.9)$        |
| $\Omega_\Lambda$                     | $0.685^{+0.015}_{-0.015}$       | $H(0.15)$                   | $72.68^{+0.93}_{-0.89}$         |                             |                              |
| $\Omega_m$                           | $0.315^{+0.015}_{-0.015}$       | $D_M(0.15)$                 | $643.4^{+9.0}_{-9.1}$           |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12693.65; R - 1 = 0.00582$$



# 11.24 base\_nrun\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BK15\_post\_BAO\_lensing\_zre6p5

| Parameter                                  | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                   | $0.02234^{+0.00030}_{-0.00029}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09613^{+0.00063}_{-0.00064}$ | $H(0.51)$                       | $89.72^{+0.45}_{-0.43}$      |
| $\Omega_{\mathrm{c}}h^2$                   | $0.1191^{+0.0019}_{-0.0019}$    | $\sigma_8$                           | $0.810^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.51)$          | $1981^{+17}_{-17}$           |
| $100\theta_{\mathrm{MC}}$                  | $1.04093^{+0.00056}_{-0.00057}$ | $S_8$                                | $0.824^{+0.021}_{-0.021}$       | $H(0.61)$                       | $95.33^{+0.38}_{-0.36}$      |
| $\tau$                                     | $0.057^{+0.014}_{-0.013}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.61)$          | $2305^{+18}_{-19}$           |
| $\ln(10^{10}A_{\mathrm{s}})$               | $3.047^{+0.028}_{-0.027}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.011}_{-0.011}$       | $H(2.33)$                       | $236.0^{+1.2}_{-1.2}$        |
| $n_{\mathrm{s}}$                           | $0.9669^{+0.0081}_{-0.0081}$    | $\sigma_8/h^{0.5}$                   | $0.984^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(2.33)$          | $5763^{+18}_{-18}$           |
| $\mathrm{d}n_{\mathrm{s}}/\mathrm{d}\ln k$ | $-0.003^{+0.014}_{-0.014}$      | $r_{\mathrm{drag}}h$                 | $99.7^{+1.5}_{-1.4}$            | $f\sigma_8(0.15)$               | $0.456^{+0.011}_{-0.011}$    |
| $r$  | $< 0.0725$                      | $\langle d^2 \rangle^{1/2}$          | $2.430^{+0.043}_{-0.042}$       | $\sigma_8(0.15)$                | $0.748^{+0.011}_{-0.0097}$   |
| $y_{\mathrm{cal}}$                         | $1.0009^{+0.0048}_{-0.0048}$    | $z_{\mathrm{re}}$                    | $7.9^{+1.3}_{-1.3}$             | $f\sigma_8(0.38)$               | $0.4744^{+0.0089}_{-0.0088}$ |
| $A_{B,\mathrm{dust}}$                      | $4.9^{+2.1}_{-1.9}$             | $10^9 A_{\mathrm{s}}$                | $2.106^{+0.060}_{-0.056}$       | $\sigma_8(0.38)$                | $0.6633^{+0.0095}_{-0.0084}$ |
| $A_{B,\mathrm{sync}}$                      | $< 3.64$                        | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.021}_{-0.021}$       | $f\sigma_8(0.51)$               | $0.4731^{+0.0081}_{-0.0080}$ |
| $\alpha_{B,\mathrm{dust}}$                 | —                               | $D_{40}$                             | $1230^{+36}_{-36}$              | $\sigma_8(0.51)$                | $0.6208^{+0.0085}_{-0.0081}$ |
| $\beta_{B,\mathrm{dust}}$                  | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                            | $5723^{+76}_{-75}$              | $f\sigma_8(0.61)$               | $0.4682^{+0.0076}_{-0.0074}$ |
| $\alpha_{B,\mathrm{sync}}$                 | —                               | $D_{810}$                            | $2537^{+26}_{-26}$              | $\sigma_8(0.61)$                | $0.5907^{+0.0081}_{-0.0077}$ |
| $\beta_{B,\mathrm{sync}}$                  | $-3.10^{+0.51}_{-0.56}$         | $D_{1420}$                           | $816.2^{+9.8}_{-9.8}$           | $f\sigma_8(2.33)$               | $0.2979^{+0.0042}_{-0.0039}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$   | $-0.36^{+0.53}_{-0.57}$         | $D_{2000}$                           | $230.3^{+3.7}_{-3.6}$           | $\sigma_8(2.33)$                | $0.3071^{+0.0044}_{-0.0042}$ |
| $A_{100}^{\mathrm{PS}}$                    | $241^{+50}_{-50}$               | $n_{\mathrm{s},0.002}$               | $0.976^{+0.042}_{-0.042}$       | $r_{0.002}$                     | $< 0.0690$                   |
| $A_{143}^{\mathrm{PS}}$                    | $40^{+20}_{-20}$                | $Y_{\mathrm{P}}$                     | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                      | $< 0.0702$                   |
| $A_{217}^{\mathrm{PS}}$                    | $102^{+30}_{-30}$               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24671^{+0.00011}_{-0.00012}$ | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.6^{+1.4}_{-1.9}$         |
| $A_{217}^{\mathrm{CIB}}$                   | $40^{+20}_{-10}$                | $10^5\mathrm{D}/\mathrm{H}$          | $2.591^{+0.056}_{-0.054}$       | $r_{10}$                        | $< 0.0356$                   |
| $A_{143}^{\mathrm{tSZ}}$                   | $< 7.48$                        | $\mathrm{Age}/\mathrm{Gyr}$          | $13.796^{+0.041}_{-0.041}$      | $10^9 A_{\mathrm{t}}$           | $< 0.153$                    |
| $r_{143\times 217}^{\mathrm{PS}}$          | $0.65^{+0.26}_{-0.25}$          | $z_{*}$                              | $1089.88^{+0.45}_{-0.45}$       | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.136$                    |
| $r_{143\times 217}^{\mathrm{CIB}}$         | —                               | $r_{*}$                              | $144.68^{+0.47}_{-0.47}$        | $f_{2000}^{143}$                | $30^{+6}_{-6}$               |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$     | —                               | $100\theta_{*}$                      | $1.04112^{+0.00055}_{-0.00057}$ | $f_{2000}^{217}$                | $107.1^{+4.2}_{-4.2}$        |
| $A^{\mathrm{kSZ}}$                         | —                               | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$ | $13.896^{+0.045}_{-0.045}$      | $f_{2000}^{143\times 217}$      | $32^{+5}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$                  | $1.01^{+0.38}_{-0.38}$          | $z_{\mathrm{drag}}$                  | $1059.81^{+0.66}_{-0.64}$       | $\chi_{\mathrm{lensing}}^2$     | $9.31 (\nu: 0.2)$            |
| $A_{143}^{\mathrm{dust}}$                  | $0.96^{+0.35}_{-0.34}$          | $r_{\mathrm{drag}}$                  | $147.35^{+0.51}_{-0.50}$        | $\chi_{\mathrm{BKPLANCK}}^2$    | $740.1 (\nu: 3.6)$           |
| $A_{217}^{\mathrm{dust}}$                  | $0.97^{+0.20}_{-0.20}$          | $k_{\mathrm{D}}$                     | $0.14057^{+0.00065}_{-0.00065}$ | $\chi_{\mathrm{simall}}^2$      | $397.4 (\nu: 2.0)$           |
| $A_{143\times 217}^{\mathrm{dust}}$        | $1.02^{+0.31}_{-0.31}$          | $100\theta_{\mathrm{D}}$             | $0.16083^{+0.00039}_{-0.00039}$ | $\chi_{\mathrm{lowl}}^2$        | $23.5 (\nu: 1.9)$            |
| $c_{100}$                                  | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\mathrm{eq}}$                    | $3381^{+43}_{-43}$              | $\chi_{\mathrm{CamSpec}}^2$     | $11514.0 (\nu: 16.3)$        |
| $c_{217}$                                  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{eq}}$                    | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{6\mathrm{DF}}^2$         | $0.050 (\nu: 0.0)$           |
| $c_{TE}$                                   | $0.9963^{+0.0096}_{-0.0095}$    | $100\theta_{\mathrm{eq}}$            | $0.8171^{+0.0081}_{-0.0079}$    | $\chi_{\mathrm{MGS}}^2$         | $1.28 (\nu: 0.1)$            |
| $c_{EE}$                                   | $0.9923^{+0.0097}_{-0.0094}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4514^{+0.0042}_{-0.0041}$    | $\chi_{\mathrm{DR12BAO}}^2$     | $4.7 (\nu: 0.8)$             |
| $H_0$                                      | $67.64^{+0.85}_{-0.82}$         | $H(0.15)$                            | $72.91^{+0.74}_{-0.71}$         | $\chi_{\mathrm{prior}}^2$       | $9.4 (\nu: 7.3)$             |
| $\Omega_{\Lambda}$                         | $0.689^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.15)$               | $641.0^{+7.1}_{-7.2}$           | $\chi_{\mathrm{CMB}}^2$         | $12684.3 (\nu: 20.7)$        |
| $\Omega_{\mathrm{m}}$                      | $0.311^{+0.011}_{-0.011}$       | $H(0.38)$                            | $83.01^{+0.55}_{-0.53}$         | $\chi_{\mathrm{BAO}}^2$         | $6.1 (\nu: 0.5)$             |
| $\Omega_{\mathrm{m}}h^2$                   | $0.1421^{+0.0018}_{-0.0018}$    | $D_{\mathrm{M}}(0.38)$               | $1529^{+14}_{-15}$              |                                 |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 12699.77$ ;  $R - 1 = 0.00794$



## 12 omegak

### 12.1 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$                       | 0.02258  | $0.02258^{+0.00054}_{-0.00053}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.555    | $0.554^{+0.067}_{-0.068}$       | $H(0.15)$                   | 58.1     | $58^{+9}_{-8}$            |
| $\Omega_c h^2$                       | 0.11749  | $0.1173^{+0.0045}_{-0.0045}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6521   | $0.650^{+0.028}_{-0.032}$       | $D_M(0.15)$                 | 820      | $823^{+100}_{-100}$       |
| $100\theta_{MC}$                     | 1.04131  | $1.0414^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$          | 1.0646   | $1.062^{+0.046}_{-0.049}$       | $H(0.38)$                   | 69.6     | $69.8^{+7.7}_{-6.8}$      |
| $\tau$                               | 0.0492   | $0.049^{+0.016}_{-0.016}$       | $r_{\text{drag}} h$         | 76.5     | $77^{+10}_{-10}$                | $D_M(0.38)$                 | 1904     | $1909^{+300}_{-200}$      |
| $\Omega_K$                           | -0.0550  | $-0.058^{+0.046}_{-0.051}$      | $\langle d^2 \rangle^{1/2}$ | 2.682    | $2.68^{+0.16}_{-0.17}$          | $H(0.51)$                   | 77.1     | $77.2^{+7.0}_{-6.6}$      |
| $\ln(10^{10} A_s)$                   | 3.0265   | $3.026^{+0.033}_{-0.035}$       | $z_{\text{re}}$             | 6.91     | $6.9^{+1.7}_{-1.7}$             | $D_M(0.51)$                 | 2435     | $2439^{+300}_{-300}$      |
| $n_s$                                | 0.9738   | $0.973^{+0.013}_{-0.013}$       | $10^9 A_s$                  | 2.063    | $2.062^{+0.068}_{-0.071}$       | $H(0.61)$                   | 83.2     | $83.3^{+6.7}_{-6.4}$      |
| $y_{\text{cal}}$                     | 0.99980  | $1.0000^{+0.0050}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | 1.8692   | $1.869^{+0.027}_{-0.027}$       | $D_M(0.61)$                 | 2807     | $2811^{+300}_{-300}$      |
| $A_{100}^{\text{PS}}$                | 220      | $229^{+50}_{-50}$               | $D_{40}$                    | 1196.9   | $1199^{+33}_{-34}$              | $H(2.33)$                   | 227.6    | $227.5^{+6.1}_{-5.9}$     |
| $A_{143}^{\text{PS}}$                | 39.7     | $33^{+20}_{-20}$                | $D_{220}$                   | 5727     | $5735^{+83}_{-84}$              | $D_M(2.33)$                 | 6470     | $6473^{+440}_{-450}$      |
| $A_{217}^{\text{PS}}$                | 107.4    | $104^{+30}_{-30}$               | $D_{810}$                   | 2528.2   | $2527^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.5405   | $0.539^{+0.048}_{-0.050}$ |
| $A_{217}^{\text{CIB}}$               | 38.2     | $37^{+10}_{-10}$                | $D_{1420}$                  | 814.4    | $814^{+10}_{-9.8}$              | $\sigma_8(0.15)$            | 0.6912   | $0.689^{+0.045}_{-0.045}$ |
| $A_{143}^{\text{tSZ}}$               | 6.27     | $4.1^{+3.5}_{-4.0}$             | $D_{2000}$                  | 232.89   | $232.5^{+4.4}_{-4.0}$           | $f\sigma_8(0.38)$           | 0.5149   | $0.512^{+0.018}_{-0.021}$ |
| $r_{143 \times 217}^{\text{PS}}$     | 0.742    | $0.68^{+0.27}_{-0.25}$          | $n_{s,0.002}$               | 0.9738   | $0.973^{+0.013}_{-0.013}$       | $\sigma_8(0.38)$            | 0.595    | $0.594^{+0.048}_{-0.052}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.69     | —                               | $Y_{\text{P}}$              | 0.245473 | $0.24547^{+0.00023}_{-0.00021}$ | $f\sigma_8(0.51)$           | 0.4935   | $0.491^{+0.012}_{-0.014}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.65     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.246800 | $0.24680^{+0.00023}_{-0.00021}$ | $\sigma_8(0.51)$            | 0.550    | $0.549^{+0.049}_{-0.052}$ |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 \text{D/H}$           | 2.548    | $2.549^{+0.098}_{-0.096}$       | $f\sigma_8(0.61)$           | 0.4758   | $0.474^{+0.014}_{-0.014}$ |
| $A_{100}^{\text{dust}}$              | 0.999    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 15.64    | $15.7^{+1.2}_{-1.2}$            | $\sigma_8(0.61)$            | 0.519    | $0.518^{+0.048}_{-0.051}$ |
| $A_{143}^{\text{dust}}$              | 0.955    | $0.95^{+0.35}_{-0.34}$          | $z_*$                       | 1089.44  | $1089.43^{+0.97}_{-0.95}$       | $f\sigma_8(2.33)$           | 0.2571   | $0.257^{+0.027}_{-0.028}$ |
| $A_{217}^{\text{dust}}$              | 0.980    | $0.98^{+0.20}_{-0.20}$          | $r_*$                       | 144.92   | $145.0^{+1.0}_{-0.93}$          | $\sigma_8(2.33)$            | 0.2560   | $0.256^{+0.032}_{-0.032}$ |
| $A_{143 \times 217}^{\text{dust}}$   | 1.019    | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04147  | $1.04151^{+0.00097}_{-0.00098}$ | $f_{2000}^{143}$            | 25.5     | $26^{+7}_{-7}$            |
| $c_{100}$                            | 0.99778  | $0.9976^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.915   | $13.920^{+0.091}_{-0.085}$      | $f_{2000}^{217}$            | 103.47   | $104.1^{+4.7}_{-4.5}$     |
| $c_{217}$                            | 1.00072  | $1.0008^{+0.0030}_{-0.0030}$    | $z_{\text{drag}}$           | 1060.24  | $1060.2^{+1.1}_{-1.0}$          | $f_{2000}^{143 \times 217}$ | 28.7     | $29^{+5}_{-5}$            |
| $H_0$                                | 51.8     | $52^{+9}_{-8}$                  | $r_{\text{drag}}$           | 147.53   | $147.58^{+0.98}_{-0.90}$        | $\chi_{\text{small}}^2$     | 395.53   | $396.7 (\nu: 1.1)$        |
| $\Omega_\Lambda$                     | 0.532    | $0.53^{+0.12}_{-0.13}$          | $k_{\text{D}}$              | 0.14056  | $0.14050^{+0.00099}_{-0.0011}$  | $\chi_{\text{lowl}}^2$      | 20.98    | $21.28 (\nu: 0.2)$        |
| $\Omega_m$                           | 0.523    | $0.53^{+0.18}_{-0.16}$          | $100\theta_{\text{D}}$      | 0.16061  | $0.16064^{+0.00059}_{-0.00057}$ | $\chi_{\text{CamSpec}}^2$   | 7045.3   | $7059.5 (\nu: 14.0)$      |
| $\Omega_m h^2$                       | 0.14072  | $0.1405^{+0.0042}_{-0.0041}$    | $z_{\text{eq}}$             | 3347     | $3343^{+99}_{-99}$              | $\chi_{\text{prior}}^2$     | 1.5      | $7.1 (\nu: 5.5)$          |
| $\Omega_m h^3$                       | 0.0730   | $0.073^{+0.014}_{-0.012}$       | $k_{\text{eq}}$             | 0.010216 | $0.01020^{+0.00030}_{-0.00030}$ | $\chi_{\text{CMB}}^2$       | 7461.8   | $7477.5 (\nu: 15.3)$      |
| $\sigma_8$                           | 0.7666   | $0.765^{+0.038}_{-0.039}$       | $100\theta_{\text{eq}}$     | 0.8241   | $0.825^{+0.020}_{-0.019}$       |                             |          |                           |
| $S_8$                                | 1.013    | $1.01^{+0.12}_{-0.12}$          | $100\theta_{s,\text{eq}}$   | 0.4549   | $0.455^{+0.010}_{-0.0098}$      |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 7463.28$ ;  $\Delta\chi_{\text{eff}}^2 = -8.46$ ;  $\bar{\chi}_{\text{eff}}^2 = 7484.59$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -6.95$ ;  $R - 1 = 0.03021$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.53 ( $\Delta$  -0.30) commander\_dx12.v3.2.29: 20.98 ( $\Delta$  -2.42) CamSpec like\_10.7HM: 7045.30 ( $\Delta$  -5.04)



## 12.2 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02258^{+0.00054}_{-0.00052}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.551^{+0.068}_{-0.066}$       | $H(0.15)$                   | $59^{+8}_{-7}$            |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1173^{+0.0045}_{-0.0045}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.651^{+0.028}_{-0.032}$       | $D_{\mathrm{M}}(0.15)$      | $814^{+100}_{-100}$       |
| $100\theta_{\mathrm{MC}}$                | $1.0414^{+0.0010}_{-0.0010}$    | $\sigma_8/h^{0.5}$                   | $1.063^{+0.046}_{-0.052}$       | $H(0.38)$                   | $70.2^{+7.7}_{-6.6}$      |
| $\tau$                                   | $0.0532^{+0.011}_{-0.0088}$     | $r_{\mathrm{drag}}h$                 | $78^{+10}_{-10}$                | $D_{\mathrm{M}}(0.38)$      | $1891^{+300}_{-200}$      |
| $\Omega_K$                               | $-0.054^{+0.043}_{-0.048}$      | $\langle d^2 \rangle^{1/2}$          | $2.68^{+0.16}_{-0.17}$          | $H(0.51)$                   | $77.6^{+7.2}_{-6.2}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.034^{+0.025}_{-0.022}$       | $z_{\mathrm{re}}$                    | $< 8.34$                        | $D_{\mathrm{M}}(0.51)$      | $2418^{+300}_{-300}$      |
| $n_{\mathrm{s}}$                         | $0.973^{+0.013}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                | $2.078^{+0.051}_{-0.046}$       | $H(0.61)$                   | $83.7^{+6.9}_{-6.0}$      |
| $y_{\mathrm{cal}}$                       | $1.0000^{+0.0050}_{-0.0048}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.868^{+0.026}_{-0.026}$       | $D_{\mathrm{M}}(0.61)$      | $2788^{+300}_{-300}$      |
| $A_{100}^{\mathrm{PS}}$                  | $229^{+50}_{-50}$               | $D_{40}$                             | $1200^{+34}_{-34}$              | $H(2.33)$                   | $227.7^{+6.0}_{-5.7}$     |
| $A_{143}^{\mathrm{PS}}$                  | $33^{+20}_{-20}$                | $D_{220}$                            | $5734^{+84}_{-84}$              | $D_{\mathrm{M}}(2.33)$      | $6444^{+430}_{-430}$      |
| $A_{217}^{\mathrm{PS}}$                  | $104^{+30}_{-30}$               | $D_{810}$                            | $2527^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.537^{+0.047}_{-0.052}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $37^{+10}_{-10}$                | $D_{1420}$                           | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.695^{+0.040}_{-0.043}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $4.1^{+3.6}_{-4.0}$             | $D_{2000}$                           | $232.5^{+4.3}_{-4.0}$           | $f\sigma_8(0.38)$           | $0.513^{+0.019}_{-0.022}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.68^{+0.27}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.973^{+0.013}_{-0.013}$       | $\sigma_8(0.38)$            | $0.599^{+0.045}_{-0.047}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.24548^{+0.00023}_{-0.00021}$ | $f\sigma_8(0.51)$           | $0.493^{+0.012}_{-0.014}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24680^{+0.00024}_{-0.00021}$ | $\sigma_8(0.51)$            | $0.554^{+0.045}_{-0.047}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.548^{+0.096}_{-0.097}$       | $f\sigma_8(0.61)$           | $0.476^{+0.012}_{-0.012}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.37}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $15.6^{+1.2}_{-1.2}$            | $\sigma_8(0.61)$            | $0.523^{+0.045}_{-0.047}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.95^{+0.34}_{-0.34}$          | $z_*$                                | $1089.42^{+0.97}_{-0.93}$       | $f\sigma_8(2.33)$           | $0.259^{+0.025}_{-0.025}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                | $144.99^{+0.98}_{-0.94}$        | $\sigma_8(2.33)$            | $0.259^{+0.031}_{-0.029}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04154^{+0.00097}_{-0.00098}$ | $f_{2000}^{143}$            | $26^{+7}_{-7}$            |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.921^{+0.089}_{-0.085}$      | $f_{2000}^{217}$            | $104.1^{+4.6}_{-4.5}$     |
| $c_{217}$                                | $1.0008^{+0.0030}_{-0.0029}$    | $z_{\mathrm{drag}}$                  | $1060.2^{+1.1}_{-1.0}$          | $f_{2000}^{143 \times 217}$ | $29^{+5}_{-5}$            |
| $H_0$                                    | $53^{+9}_{-8}$                  | $r_{\mathrm{drag}}$                  | $147.59^{+0.95}_{-0.91}$        | $\chi_{\mathrm{simall}}^2$  | $396.4 (\nu: 0.8)$        |
| $\Omega_{\Lambda}$                       | $0.54^{+0.11}_{-0.12}$          | $k_{\mathrm{D}}$                     | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{\mathrm{lowl}}^2$    | $21.27 (\nu: 0.2)$        |
| $\Omega_{\mathrm{m}}$                    | $0.52^{+0.17}_{-0.16}$          | $100\theta_{\mathrm{D}}$             | $0.16064^{+0.00057}_{-0.00057}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7059.4 (\nu: 13.9)$      |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1405^{+0.0041}_{-0.0041}$    | $z_{\mathrm{eq}}$                    | $3342^{+99}_{-99}$              | $\chi_{\mathrm{prior}}^2$   | $7.1 (\nu: 5.4)$          |
| $\Omega_{\mathrm{m}}h^3$                 | $0.074^{+0.014}_{-0.012}$       | $k_{\mathrm{eq}}$                    | $0.01020^{+0.00030}_{-0.00030}$ | $\chi_{\mathrm{CMB}}^2$     | $7477.1 (\nu: 14.7)$      |
| $\sigma_8$                               | $0.769^{+0.034}_{-0.036}$       | $100\theta_{\mathrm{eq}}$            | $0.825^{+0.020}_{-0.019}$       |                             |                           |
| $S_8$                                    | $1.01^{+0.12}_{-0.12}$          | $100\theta_{\mathrm{s,eq}}$          | $0.456^{+0.010}_{-0.0097}$      |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7484.13; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -7.13; R - 1 = 0.03650$$



### 12.3 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022535 | $0.02254^{+0.00036}_{-0.00034}$ | $\sigma_8$                     | 0.7817   | $0.777^{+0.030}_{-0.031}$       | $100\theta_{\text{eq}}$     | 0.8226   | $0.822^{+0.012}_{-0.013}$    |
| $\Omega_c h^2$                       | 0.11783  | $0.1179^{+0.0030}_{-0.0028}$    | $S_8$                          | 0.943    | $0.95^{+0.10}_{-0.10}$          | $100\theta_{\text{s,eq}}$   | 0.4541   | $0.4540^{+0.0063}_{-0.0065}$ |
| $100\theta_{\text{MC}}$              | 1.04110  | $1.04111^{+0.00064}_{-0.00061}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.516    | $0.522^{+0.056}_{-0.056}$       | $H(0.15)$                   | 62.7     | $62^{+8}_{-7}$               |
| $\tau$                               | 0.0509   | $0.048^{+0.016}_{-0.017}$       | $\sigma_8 \Omega_m^{0.25}$     | 0.6353   | $0.637^{+0.026}_{-0.027}$       | $D_{\text{M}}(0.15)$        | 754      | $766^{+100}_{-90}$           |
| $\Omega_K$                           | -0.0320  | $-0.037^{+0.032}_{-0.034}$      | $\sigma_8/h^{0.5}$             | 1.0367   | $1.039^{+0.043}_{-0.044}$       | $H(0.38)$                   | 73.7     | $73.2^{+7.0}_{-6.2}$         |
| $\ln(10^{10} A_s)$                   | 3.0304   | $3.025^{+0.035}_{-0.035}$       | $r_{\text{drag}} h$            | 83.8     | $83^{+10}_{-10}$                | $D_{\text{M}}(0.38)$        | 1769     | $1793^{+200}_{-200}$         |
| $n_s$                                | 0.9719   | $0.9713^{+0.0094}_{-0.0092}$    | $\langle d^2 \rangle^{1/2}$    | 2.591    | $2.60^{+0.13}_{-0.14}$          | $H(0.51)$                   | 80.9     | $80.4^{+6.6}_{-5.8}$         |
| $y_{\text{cal}}$                     | 0.99975  | $1.0000^{+0.0049}_{-0.0050}$    | $z_{\text{re}}$                | 7.15     | $6.8^{+1.7}_{-1.9}$             | $D_{\text{M}}(0.51)$        | 2272     | $2301^{+250}_{-240}$         |
| $A_{100}^{\text{PS}}$                | 225.5    | $230^{+50}_{-50}$               | $10^9 A_s$                     | 2.070    | $2.060^{+0.072}_{-0.072}$       | $H(0.61)$                   | 86.9     | $86.4^{+6.3}_{-5.6}$         |
| $A_{143}^{\text{PS}}$                | 42.6     | $34^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | 1.8700   | $1.871^{+0.024}_{-0.023}$       | $D_{\text{M}}(0.61)$        | 2629     | $2660^{+280}_{-270}$         |
| $A_{217}^{\text{PS}}$                | 106.3    | $104^{+20}_{-30}$               | $D_{40}$                       | 1204.1   | $1205^{+28}_{-28}$              | $H(2.33)$                   | 229.98   | $229.8^{+5.1}_{-4.5}$        |
| $A_{217}^{\text{CIB}}$               | 38.8     | $37^{+10}_{-10}$                | $D_{220}$                      | 5727     | $5733^{+76}_{-77}$              | $D_{\text{M}}(2.33)$        | 6232     | $6269^{+370}_{-370}$         |
| $A_{143}^{\text{tSZ}}$               | 5.71     | $4.1^{+3.6}_{-4.1}$             | $D_{810}$                      | 2529.7   | $2529^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.5111   | $0.515^{+0.042}_{-0.046}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.718    | $0.68^{+0.26}_{-0.27}$          | $D_{1420}$                     | 814.9    | $814.6^{+9.4}_{-9.5}$           | $\sigma_8(0.15)$            | 0.7114   | $0.706^{+0.036}_{-0.036}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.74     | —                               | $D_{2000}$                     | 232.05   | $231.9^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | 0.5031   | $0.503^{+0.019}_{-0.021}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.73     | —                               | $n_{\text{s},0.002}$           | 0.9719   | $0.9713^{+0.0094}_{-0.0092}$    | $\sigma_8(0.38)$            | 0.6188   | $0.613^{+0.039}_{-0.043}$    |
| $A^{\text{kSZ}}$                     | 0.9      | —                               | $Y_{\text{P}}$                 | 0.245457 | $0.24546^{+0.00014}_{-0.00013}$ | $f\sigma_8(0.51)$           | 0.4890   | $0.488^{+0.012}_{-0.013}$    |
| $A_{100}^{\text{dust}}$              | 1.005    | $1.02^{+0.38}_{-0.38}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246784 | $0.24678^{+0.00014}_{-0.00014}$ | $\sigma_8(0.51)$            | 0.5743   | $0.569^{+0.040}_{-0.043}$    |
| $A_{143}^{\text{dust}}$              | 0.959    | $0.95^{+0.34}_{-0.34}$          | $10^5 D/H$                     | 2.556    | $2.556^{+0.064}_{-0.065}$       | $f\sigma_8(0.61)$           | 0.4757   | $0.4739^{+0.0097}_{-0.011}$  |
| $A_{217}^{\text{dust}}$              | 0.981    | $0.98^{+0.20}_{-0.20}$          | Age/Gyr                        | 15.00    | $15.1^{+1.0}_{-0.97}$           | $\sigma_8(0.61)$            | 0.5435   | $0.538^{+0.040}_{-0.043}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.002    | $1.01^{+0.31}_{-0.32}$          | $z_*$                          | 1089.53  | $1089.53^{+0.62}_{-0.63}$       | $f\sigma_8(2.33)$           | 0.2710   | $0.268^{+0.022}_{-0.024}$    |
| $c_{100}$                            | 0.99779  | $0.9976^{+0.0021}_{-0.0020}$    | $r_*$                          | 144.87   | $144.85^{+0.64}_{-0.65}$        | $\sigma_8(2.33)$            | 0.2727   | $0.269^{+0.028}_{-0.027}$    |
| $c_{217}$                            | 1.00089  | $1.0008^{+0.0031}_{-0.0030}$    | $100\theta_*$                  | 1.04127  | $1.04127^{+0.00063}_{-0.00060}$ | $f_{2000}^{143}$            | 26.9     | $27^{+6}_{-6}$               |
| $c_{TE}$                             | 0.9927   | $0.992^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.913   | $13.911^{+0.058}_{-0.060}$      | $f_{2000}^{217}$            | 104.33   | $104.6^{+4.1}_{-4.0}$        |
| $c_{EE}$                             | 0.9899   | $0.9897^{+0.0095}_{-0.0098}$    | $z_{\text{drag}}$              | 1060.16  | $1060.17^{+0.72}_{-0.69}$       | $f_{2000}^{143 \times 217}$ | 29.52    | $30^{+4}_{-4}$               |
| $H_0$                                | 56.9     | $56^{+8}_{-8}$                  | $r_{\text{drag}}$              | 147.49   | $147.47^{+0.63}_{-0.65}$        | $\chi_{\text{small}}^2$     | 395.63   | $396.7 (\nu: 1.4)$           |
| $\Omega_{\Lambda}$                   | 0.596    | $0.582^{+0.090}_{-0.095}$       | $k_{\text{D}}$                 | 0.14058  | $0.14059^{+0.00069}_{-0.00068}$ | $\chi_{\text{lowl}}^2$      | 21.16    | $21.40 (\nu: 0.2)$           |
| $\Omega_{\text{m}}$                  | 0.436    | $0.45^{+0.13}_{-0.12}$          | $100\theta_{\text{D}}$         | 0.160629 | $0.16063^{+0.00040}_{-0.00041}$ | $\chi_{\text{CamSpec}}^2$   | 11495.3  | $11511.3 (\nu: 15.1)$        |
| $\Omega_{\text{m}} h^2$              | 0.14101  | $0.1411^{+0.0028}_{-0.0027}$    | $z_{\text{eq}}$                | 3354     | $3356^{+67}_{-64}$              | $\chi_{\text{prior}}^2$     | 1.9      | $7.7 (\nu: 5.4)$             |
| $\Omega_{\text{m}} h^3$              | 0.0802   | $0.079^{+0.012}_{-0.011}$       | $k_{\text{eq}}$                | 0.010238 | $0.01024^{+0.00020}_{-0.00019}$ | $\chi_{\text{CMB}}^2$       | 11912.1  | $11929.5 (\nu: 16.8)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11914.02$ ;  $\Delta\chi_{\text{eff}}^2 = -6.75$ ;  $\bar{\chi}_{\text{eff}}^2 = 11937.16$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -5.30$ ;  $R - 1 = 0.03285$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.63 ( $\Delta$  -0.27) commander\_dx12\_v3\_2\_29: 21.16 ( $\Delta$  -1.84) CamSpec like\_10.7HM\_1400\_unified: 11495.33 ( $\Delta$  -4.32)



## 12.4 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$   | $0.02253^{+0.00035}_{-0.00034}$ | $\sigma_8$                          | $0.782^{+0.025}_{-0.026}$       | $100\theta_{\text{eq}}$     | $0.822^{+0.012}_{-0.013}$    |
| $\Omega_c h^2$   | $0.1179^{+0.0029}_{-0.0028}$    | $S_8$                               | $0.946^{+0.098}_{-0.098}$       | $100\theta_{\text{s,eq}}$   | $0.4540^{+0.0063}_{-0.0064}$ |
| $100\theta_{\text{MC}}$  | $1.04111^{+0.00064}_{-0.00061}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.518^{+0.054}_{-0.054}$       | $H(0.15)$                   | $63^{+7}_{-7}$               |
| $\tau$   | $0.0524^{+0.010}_{-0.0083}$     | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.636^{+0.027}_{-0.027}$       | $D_{\text{M}}(0.15)$        | $757^{+90}_{-90}$            |
| $\Omega_K$   | $-0.034^{+0.030}_{-0.031}$      | $\sigma_8/h^{0.5}$                  | $1.038^{+0.043}_{-0.044}$       | $H(0.38)$                   | $73.8^{+6.6}_{-6.2}$         |
| $\ln(10^{10} A_{\text{s}})$  | $3.034^{+0.024}_{-0.021}$       | $r_{\text{drag}} h$                 | $84^{+10}_{-10}$                | $D_{\text{M}}(0.38)$        | $1773^{+190}_{-190}$         |
| $n_{\text{s}}$   | $0.9715^{+0.0093}_{-0.0090}$    | $\langle d^2 \rangle^{1/2}$         | $2.60^{+0.13}_{-0.14}$          | $H(0.51)$                   | $81.0^{+6.2}_{-5.8}$         |
| $y_{\text{cal}}$   | $1.0000^{+0.0049}_{-0.0050}$    | $z_{\text{re}}$                     | $< 8.30$                        | $D_{\text{M}}(0.51)$        | $2277^{+230}_{-230}$         |
| $A_{100}^{\text{PS}}$  | $230^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | $2.077^{+0.051}_{-0.044}$       | $H(0.61)$                   | $86.9^{+6.0}_{-5.6}$         |
| $A_{143}^{\text{PS}}$  | $34^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.871^{+0.024}_{-0.023}$       | $D_{\text{M}}(0.61)$        | $2634^{+250}_{-260}$         |
| $A_{217}^{\text{PS}}$  | $104^{+20}_{-30}$               | $D_{40}$                            | $1206^{+28}_{-28}$              | $H(2.33)$                   | $230.1^{+4.8}_{-4.6}$        |
| $A_{217}^{\text{CIB}}$   | $37^{+10}_{-10}$                | $D_{220}$                           | $5731^{+75}_{-77}$              | $D_{\text{M}}(2.33)$        | $6236^{+340}_{-370}$         |
| $A_{143}^{\text{tSZ}}$   | $4.1^{+3.6}_{-4.1}$             | $D_{810}$                           | $2529^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.512^{+0.041}_{-0.045}$    |
| $r_{143 \times 217}^{\text{PS}}$   | $0.67^{+0.26}_{-0.27}$          | $D_{1420}$                          | $814.7^{+9.5}_{-9.5}$           | $\sigma_8(0.15)$            | $0.712^{+0.031}_{-0.032}$    |
| $r_{143 \times 217}^{\text{CIB}}$  | —                               | $D_{2000}$                          | $231.9^{+3.4}_{-3.4}$           | $f\sigma_8(0.38)$           | $0.503^{+0.020}_{-0.022}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$   | —                               | $n_{\text{s},0.002}$                | $0.9715^{+0.0093}_{-0.0090}$    | $\sigma_8(0.38)$            | $0.619^{+0.036}_{-0.036}$    |
| $A^{\text{kSZ}}$   | —                               | $Y_{\text{P}}$                      | $0.24546^{+0.00014}_{-0.00013}$ | $f\sigma_8(0.51)$           | $0.489^{+0.012}_{-0.013}$    |
| $A_{100}^{\text{dust}}$  | $1.02^{+0.39}_{-0.37}$          | $Y_{\text{P}}^{\text{BBN}}$         | $0.24678^{+0.00014}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.574^{+0.037}_{-0.036}$    |
| $A_{143}^{\text{dust}}$  | $0.94^{+0.34}_{-0.34}$          | $10^5 \text{D}/\text{H}$            | $2.556^{+0.063}_{-0.064}$       | $f\sigma_8(0.61)$           | $0.4755^{+0.0088}_{-0.0093}$ |
| $A_{217}^{\text{dust}}$  | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$             | $15.01^{+0.91}_{-0.95}$         | $\sigma_8(0.61)$            | $0.544^{+0.037}_{-0.036}$    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.01^{+0.31}_{-0.31}$          | $z_*$                               | $1089.53^{+0.61}_{-0.61}$       | $f\sigma_8(2.33)$           | $0.271^{+0.021}_{-0.020}$    |
| $c_{100}$  | $0.9976^{+0.0020}_{-0.0020}$    | $r_*$                               | $144.86^{+0.64}_{-0.64}$        | $\sigma_8(2.33)$            | $0.273^{+0.026}_{-0.024}$    |
| $c_{217}$  | $1.0008^{+0.0031}_{-0.0030}$    | $100\theta_*$                       | $1.04128^{+0.00063}_{-0.00060}$ | $f_{2000}^{143}$            | $27^{+6}_{-6}$               |
| $c_{TE}$   | $0.992^{+0.010}_{-0.010}$       | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.912^{+0.059}_{-0.061}$      | $f_{2000}^{217}$            | $104.6^{+4.1}_{-4.0}$        |
| $c_{EE}$   | $0.9898^{+0.0096}_{-0.0097}$    | $z_{\text{drag}}$                   | $1060.16^{+0.73}_{-0.68}$       | $f_{2000}^{143 \times 217}$ | $30^{+4}_{-4}$               |
| $H_0$  | $57^{+8}_{-7}$                  | $r_{\text{drag}}$                   | $147.48^{+0.64}_{-0.64}$        | $\chi_{\text{simall}}^2$    | $396.2 (\nu: 0.6)$           |
| $\Omega_{\Lambda}$   | $0.592^{+0.083}_{-0.087}$       | $k_{\text{D}}$                      | $0.14058^{+0.00067}_{-0.00071}$ | $\chi_{\text{lowl}}^2$      | $21.43 (\nu: 0.2)$           |
| $\Omega_{\text{m}}$  | $0.44^{+0.12}_{-0.11}$          | $100\theta_{\text{D}}$              | $0.16064^{+0.00040}_{-0.00040}$ | $\chi_{\text{CamSpec}}^2$   | $11511.3 (\nu: 15.3)$        |
| $\Omega_{\text{m}} h^2$  | $0.1410^{+0.0027}_{-0.0027}$    | $z_{\text{eq}}$                     | $3355^{+66}_{-64}$              | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.5)$             |
| $\Omega_{\text{m}} h^3$  | $0.080^{+0.012}_{-0.011}$       | $k_{\text{eq}}$                     | $0.01024^{+0.00020}_{-0.00020}$ | $\chi_{\text{CMB}}^2$       | $11929.0 (\nu: 16.2)$        |
| $\bar{\chi}_{\text{eff}}^2 = 11936.68; \Delta\bar{\chi}_{\text{eff}}^2 = -5.50; R - 1 = 0.03528$ |                                 |                                     |                                 |                             |                              |



## 12.5 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022178 | $0.02217^{+0.00045}_{-0.00044}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6036   | $0.604^{+0.020}_{-0.019}$       | $H(0.38)$                   | 83.23    | $83.3^{+1.3}_{-1.3}$         |
| $\Omega_c h^2$                       | 0.11972  | $0.1197^{+0.0045}_{-0.0042}$    | $\sigma_8/h^{0.5}$          | 0.9824   | $0.982^{+0.026}_{-0.025}$       | $D_M(0.38)$                 | 1524.9   | $1524^{+27}_{-26}$           |
| $100\theta_{MC}$                     | 1.04093  | $1.04094^{+0.00097}_{-0.00097}$ | $r_{\text{drag}} h$         | 99.96    | $100.0^{+2.0}_{-2.0}$           | $H(0.51)$                   | 89.95    | $90.0^{+1.4}_{-1.3}$         |
| $\tau$                               | 0.0528   | $0.053^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.428    | $2.425^{+0.060}_{-0.057}$       | $D_M(0.51)$                 | 1975.5   | $1975^{+34}_{-33}$           |
| $\Omega_K$                           | 0.0011   | $0.0011^{+0.0051}_{-0.0050}$    | $z_{\text{re}}$             | 7.57     | $7.5^{+1.7}_{-1.7}$             | $H(0.61)$                   | 95.57    | $95.6^{+1.4}_{-1.4}$         |
| $\ln(10^{10} A_s)$                   | 3.0378   | $3.038^{+0.034}_{-0.032}$       | $10^9 A_s$                  | 2.086    | $2.086^{+0.072}_{-0.066}$       | $D_M(0.61)$                 | 2299.0   | $2298^{+38}_{-37}$           |
| $n_s$                                | 0.9652   | $0.966^{+0.012}_{-0.012}$       | $10^9 A_s e^{-2\tau}$       | 1.8769   | $1.877^{+0.027}_{-0.027}$       | $H(2.33)$                   | 236.44   | $236.4^{+3.7}_{-3.5}$        |
| $y_{\text{cal}}$                     | 1.00027  | $1.0004^{+0.0047}_{-0.0049}$    | $D_{40}$                    | 1225.3   | $1224^{+32}_{-31}$              | $D_M(2.33)$                 | 5750     | $5749^{+74}_{-75}$           |
| $A_{100}^{\text{PS}}$                | 242.6    | $242^{+50}_{-50}$               | $D_{220}$                   | 5703     | $5703^{+78}_{-81}$              | $f\sigma_8(0.15)$           | 0.4550   | $0.455^{+0.018}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | 37.7     | $41^{+20}_{-20}$                | $D_{810}$                   | 2532.5   | $2533^{+26}_{-27}$              | $\sigma_8(0.15)$            | 0.7478   | $0.748^{+0.020}_{-0.018}$    |
| $A_{217}^{\text{PS}}$                | 100.4    | $101^{+30}_{-30}$               | $D_{1420}$                  | 814.0    | $814^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4736   | $0.474^{+0.015}_{-0.015}$    |
| $A_{217}^{\text{CIB}}$               | 43.3     | $41^{+10}_{-10}$                | $D_{2000}$                  | 229.53   | $229.6^{+3.7}_{-3.6}$           | $\sigma_8(0.38)$            | 0.6631   | $0.663^{+0.017}_{-0.016}$    |
| $A_{143}^{\text{tSZ}}$               | 4.78     | $< 7.42$                        | $n_{s,0.002}$               | 0.9652   | $0.966^{+0.012}_{-0.012}$       | $f\sigma_8(0.51)$           | 0.4724   | $0.472^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.594    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.245317 | $0.24531^{+0.00018}_{-0.00021}$ | $\sigma_8(0.51)$            | 0.6206   | $0.621^{+0.016}_{-0.015}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.60     | —                               | $Y_P^{\text{BBN}}$          | 0.246643 | $0.24664^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.61)$           | 0.4675   | $0.468^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.01     | —                               | $10^5 D/H$                  | 2.622    | $2.623^{+0.084}_{-0.084}$       | $\sigma_8(0.61)$            | 0.5906   | $0.591^{+0.015}_{-0.014}$    |
| $A^{\text{kSZ}}$                     | 3.1      | —                               | Age/Gyr                     | 13.764   | $13.76^{+0.19}_{-0.19}$         | $f\sigma_8(2.33)$           | 0.2978   | $0.2979^{+0.0074}_{-0.0070}$ |
| $A_{100}^{\text{dust}}$              | 1.006    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1090.14  | $1090.14^{+0.87}_{-0.83}$       | $\sigma_8(2.33)$            | 0.3072   | $0.3074^{+0.0081}_{-0.0078}$ |
| $A_{143}^{\text{dust}}$              | 0.971    | $0.98^{+0.34}_{-0.34}$          | $r_*$                       | 144.65   | $144.66^{+0.95}_{-0.99}$        | $f_{2000}^{143}$            | 30.9     | $31^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.961    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04114  | $1.04114^{+0.00094}_{-0.00095}$ | $f_{2000}^{217}$            | 107.63   | $107.5^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 1.040    | $1.03^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | 13.893   | $13.894^{+0.087}_{-0.091}$      | $f_{2000}^{143 \times 217}$ | 33.15    | $33^{+4}_{-4}$               |
| $c_{100}$                            | 0.99748  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | 1059.47  | $1059.46^{+0.89}_{-0.86}$       | $\chi_{\text{small}}^2$     | 395.87   | $397.0 (\nu: 1.6)$           |
| $c_{217}$                            | 1.00125  | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$           | 147.38   | $147.39^{+0.93}_{-0.98}$        | $\chi_{\text{lowl}}^2$      | 23.19    | $23.2 (\nu: 1.0)$            |
| $H_0$                                | 67.82    | $67.9^{+1.4}_{-1.4}$            | $k_D$                       | 0.14042  | $0.1404^{+0.0010}_{-0.00099}$   | $\chi_{\text{CamSpec}}^2$   | 7051.1   | $7064.3 (\nu: 14.7)$         |
| $\Omega_\Lambda$                     | 0.6890   | $0.689^{+0.015}_{-0.016}$       | $100\theta_D$               | 0.16104  | $0.16105^{+0.00051}_{-0.00051}$ | $\chi_{6\text{DF}}^2$       | 0.011    | $0.053 (\nu: 0.0)$           |
| $\Omega_m$                           | 0.3099   | $0.310^{+0.015}_{-0.014}$       | $z_{\text{eq}}$             | 3391     | $3390^{+100}_{-94}$             | $\chi_{\text{MGS}}^2$       | 1.41     | $1.52 (\nu: 0.2)$            |
| $\Omega_m h^2$                       | 0.14255  | $0.1425^{+0.0042}_{-0.0039}$    | $k_{\text{eq}}$             | 0.010350 | $0.01035^{+0.00031}_{-0.00029}$ | $\chi_{\text{DR12BAO}}^2$   | 3.68     | $4.5 (\nu: 1.6)$             |
| $\Omega_m h^3$                       | 0.09668  | $0.0967^{+0.0037}_{-0.0034}$    | $100\theta_{\text{eq}}$     | 0.8148   | $0.815^{+0.018}_{-0.019}$       | $\chi_{\text{prior}}^2$     | 2.3      | $7.5 (\nu: 5.6)$             |
| $\sigma_8$                           | 0.8091   | $0.809^{+0.021}_{-0.020}$       | $100\theta_{s,\text{eq}}$   | 0.4503   | $0.4504^{+0.0094}_{-0.0097}$    | $\chi_{\text{BAO}}^2$       | 5.10     | $6.1 (\nu: 1.2)$             |
| $S_8$                                | 0.8223   | $0.822^{+0.034}_{-0.033}$       | $H(0.15)$                   | 73.11    | $73.1^{+1.3}_{-1.3}$            | $\chi_{\text{CMB}}^2$       | 7470.1   | $7484.5 (\nu: 15.1)$         |
| $\sigma_8 \Omega_m^{0.5}$            | 0.4504   | $0.450^{+0.019}_{-0.018}$       | $D_M(0.15)$                 | 639.3    | $639^{+12}_{-12}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 7477.49$ ;  $\bar{\chi}_{\text{eff}}^2 = 7498.13$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 0.57$ ;  $R - 1 = 0.00836$

$\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 MGS: 1.41 DR12BAO: 3.69 CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 commander\_dx12\_v3\_2\_29: 23.19 CamSpec like\_10.7HM: 7051.07



## 12.6 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02218^{+0.00045}_{-0.00042}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.2^{+1.3}_{-1.3}$         |
| $\Omega_c h^2$                       | $0.1199^{+0.0040}_{-0.0038}$    | $\sigma_8/h^{0.5}$          | $0.985^{+0.019}_{-0.019}$       | $D_M(0.38)$                 | $1525^{+27}_{-26}$           |
| $100\theta_{MC}$                     | $1.04091^{+0.00094}_{-0.00095}$ | $r_{\text{drag}} h$         | $99.9^{+1.9}_{-1.9}$            | $H(0.51)$                   | $89.9^{+1.4}_{-1.3}$         |
| $\tau$                               | $0.054^{+0.017}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | $2.434^{+0.044}_{-0.044}$       | $D_M(0.51)$                 | $1976^{+33}_{-33}$           |
| $\Omega_K$                           | $0.0011^{+0.0050}_{-0.0049}$    | $z_{\text{re}}$             | $7.7^{+1.6}_{-1.6}$             | $H(0.61)$                   | $95.6^{+1.4}_{-1.4}$         |
| $\ln(10^{10} A_s)$                   | $3.042^{+0.031}_{-0.029}$       | $10^9 A_s$                  | $2.095^{+0.065}_{-0.060}$       | $D_M(0.61)$                 | $2300^{+38}_{-38}$           |
| $n_s$                                | $0.965^{+0.011}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.025}_{-0.024}$       | $H(2.33)$                   | $236.6^{+3.3}_{-3.3}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0047}_{-0.0050}$    | $D_{40}$                    | $1227^{+28}_{-28}$              | $D_M(2.33)$                 | $5750^{+73}_{-74}$           |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{220}$                   | $5708^{+81}_{-83}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{810}$                   | $2534^{+26}_{-27}$              | $\sigma_8(0.15)$            | $0.750^{+0.015}_{-0.015}$    |
| $A_{217}^{\text{PS}}$                | $101^{+20}_{-30}$               | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $D_{2000}$                  | $229.7^{+3.7}_{-3.7}$           | $\sigma_8(0.38)$            | $0.665^{+0.014}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $n_{s,0.002}$               | $0.965^{+0.011}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.474^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | $0.24531^{+0.00018}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.622^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P^{\text{BBN}}$          | $0.24664^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$           | $0.4690^{+0.0096}_{-0.0096}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 D/H$                  | $2.623^{+0.082}_{-0.083}$       | $\sigma_8(0.61)$            | $0.592^{+0.013}_{-0.012}$    |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.76^{+0.19}_{-0.19}$         | $f\sigma_8(2.33)$           | $0.2985^{+0.0064}_{-0.0061}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $z_*$                       | $1090.16^{+0.80}_{-0.80}$       | $\sigma_8(2.33)$            | $0.3080^{+0.0073}_{-0.0070}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $r_*$                       | $144.61^{+0.87}_{-0.88}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.19}_{-0.20}$          | $100\theta_*$               | $1.04111^{+0.00092}_{-0.00093}$ | $f_{2000}^{217}$            | $107.5^{+4.0}_{-3.9}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $D_M(z_*)/\text{Gpc}$       | $13.890^{+0.079}_{-0.079}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\text{drag}}$           | $1059.47^{+0.88}_{-0.88}$       | $\chi_{\text{lensing}}^2$   | $9.49 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0012^{+0.0030}_{-0.0030}$    | $r_{\text{drag}}$           | $147.34^{+0.86}_{-0.87}$        | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.8)$           |
| $H_0$                                | $67.8^{+1.4}_{-1.3}$            | $k_D$                       | $0.14045^{+0.00094}_{-0.00096}$ | $\chi_{\text{lowl}}^2$      | $23.4 (\nu: 0.8)$            |
| $\Omega_\Lambda$                     | $0.688^{+0.013}_{-0.013}$       | $100\theta_D$               | $0.16104^{+0.00051}_{-0.00050}$ | $\chi_{\text{CamSpec}}^2$   | $7063.5 (\nu: 13.3)$         |
| $\Omega_m$                           | $0.311^{+0.013}_{-0.012}$       | $z_{\text{eq}}$             | $3395^{+89}_{-86}$              | $\chi_{6\text{DF}}^2$       | $0.055 (\nu: 0.0)$           |
| $\Omega_m h^2$                       | $0.1427^{+0.0037}_{-0.0036}$    | $k_{\text{eq}}$             | $0.01036^{+0.00027}_{-0.00026}$ | $\chi_{\text{MGS}}^2$       | $1.44 (\nu: 0.2)$            |
| $\Omega_m h^3$                       | $0.0967^{+0.0036}_{-0.0033}$    | $100\theta_{\text{eq}}$     | $0.814^{+0.017}_{-0.017}$       | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.7)$             |
| $\sigma_8$                           | $0.811^{+0.017}_{-0.016}$       | $100\theta_{s,\text{eq}}$   | $0.4500^{+0.0086}_{-0.0085}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 5.6)$             |
| $S_8$                                | $0.826^{+0.026}_{-0.024}$       | $H(0.15)$                   | $73.1^{+1.3}_{-1.3}$            | $\chi_{\text{CMB}}^2$       | $7493.5 (\nu: 14.9)$         |
| $\sigma_8 \Omega_m^{0.5}$            | $0.452^{+0.014}_{-0.013}$       | $D_M(0.15)$                 | $640^{+12}_{-12}$               | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 1.3)$             |

$$\bar{\chi}_{\text{eff}}^2 = 7507.17; \Delta \bar{\chi}_{\text{eff}}^2 = 0.69; R - 1 = 0.01378$$



## 12.7 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02219^{+0.00045}_{-0.00043}$ | $\sigma_8/h^{0.5}$          | $0.985^{+0.019}_{-0.018}$       | $H(0.51)$                   | $90.0^{+1.4}_{-1.3}$         |
| $\Omega_c h^2$                       | $0.1197^{+0.0039}_{-0.0038}$    | $r_{\text{drag}} h$         | $100.0^{+1.8}_{-1.8}$           | $D_M(0.51)$                 | $1975^{+33}_{-33}$           |
| $100\theta_{\text{MC}}$              | $1.04094^{+0.00093}_{-0.00095}$ | $\langle d^2 \rangle^{1/2}$ | $2.432^{+0.043}_{-0.043}$       | $H(0.61)$                   | $95.6^{+1.4}_{-1.4}$         |
| $\tau$                               | $0.055^{+0.017}_{-0.015}$       | $z_{\text{re}}$             | $7.7^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | $2298^{+37}_{-38}$           |
| $\Omega_K$                           | $0.0011^{+0.0050}_{-0.0049}$    | $10^9 A_s$                  | $2.096^{+0.067}_{-0.060}$       | $H(2.33)$                   | $236.4^{+3.3}_{-3.3}$        |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.031}_{-0.029}$       | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.025}_{-0.024}$       | $D_M(2.33)$                 | $5749^{+73}_{-74}$           |
| $n_s$                                | $0.966^{+0.011}_{-0.011}$       | $D_{40}$                    | $1226^{+29}_{-28}$              | $f\sigma_8(0.15)$           | $0.456^{+0.013}_{-0.012}$    |
| $y_{\text{cal}}$                     | $1.0006^{+0.0047}_{-0.0050}$    | $D_{220}$                   | $5710^{+80}_{-83}$              | $\sigma_8(0.15)$            | $0.750^{+0.016}_{-0.015}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                   | $2534^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.665^{+0.014}_{-0.013}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $229.8^{+3.7}_{-3.6}$           | $f\sigma_8(0.51)$           | $0.473^{+0.010}_{-0.0099}$   |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $n_{s,0.002}$               | $0.966^{+0.011}_{-0.011}$       | $\sigma_8(0.51)$            | $0.622^{+0.013}_{-0.013}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $Y_{\text{P}}$              | $0.24532^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$           | $0.4686^{+0.0096}_{-0.0094}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24664^{+0.00018}_{-0.00020}$ | $\sigma_8(0.61)$            | $0.592^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.620^{+0.082}_{-0.082}$       | $f\sigma_8(2.33)$           | $0.2986^{+0.0064}_{-0.0061}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$     | $13.76^{+0.19}_{-0.19}$         | $\sigma_8(2.33)$            | $0.3081^{+0.0073}_{-0.0069}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.13^{+0.79}_{-0.80}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | $r_*$                       | $144.65^{+0.86}_{-0.85}$        | $f_{2000}^{217}$            | $107.5^{+4.0}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $100\theta_*$               | $1.04114^{+0.00091}_{-0.00093}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.19}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.893^{+0.078}_{-0.079}$      | $\chi_{\text{lensing}}^2$   | $9.50 (\nu: 0.4)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.49^{+0.90}_{-0.86}$       | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.9)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $r_{\text{drag}}$           | $147.37^{+0.87}_{-0.85}$        | $\chi_{\text{lowl}}^2$      | $23.3 (\nu: 0.8)$            |
| $c_{217}$                            | $1.0012^{+0.0030}_{-0.0031}$    | $k_{\text{D}}$              | $0.14043^{+0.00094}_{-0.00095}$ | $\chi_{\text{CamSpec}}^2$   | $7063.6 (\nu: 13.3)$         |
| $H_0$                                | $67.9^{+1.3}_{-1.3}$            | $100\theta_{\text{D}}$      | $0.16103^{+0.00050}_{-0.00050}$ | $\chi_{\text{JLA}}^2$       | $1035.07 (\nu: 0.0)$         |
| $\Omega_{\Lambda}$                   | $0.689^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3391^{+87}_{-85}$              | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.310^{+0.013}_{-0.012}$       | $k_{\text{eq}}$             | $0.01035^{+0.00027}_{-0.00026}$ | $\chi_{\text{MGS}}^2$       | $1.51 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1425^{+0.0037}_{-0.0036}$    | $100\theta_{\text{eq}}$     | $0.815^{+0.016}_{-0.016}$       | $\chi_{\text{DR12BAO}}^2$   | $4.4 (\nu: 1.4)$             |
| $\Omega_{\text{m}} h^3$              | $0.0967^{+0.0036}_{-0.0033}$    | $100\theta_{\text{s,eq}}$   | $0.4504^{+0.0085}_{-0.0084}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 5.6)$             |
| $\sigma_8$                           | $0.811^{+0.017}_{-0.016}$       | $H(0.15)$                   | $73.1^{+1.3}_{-1.3}$            | $\chi_{\text{CMB}}^2$       | $7493.6 (\nu: 14.8)$         |
| $S_8$                                | $0.824^{+0.025}_{-0.024}$       | $D_M(0.15)$                 | $639^{+12}_{-12}$               | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 1.0)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.451^{+0.014}_{-0.013}$       | $H(0.38)$                   | $83.3^{+1.3}_{-1.3}$            |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.605^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | $1524^{+26}_{-26}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8542.21; \Delta \bar{\chi}_{\text{eff}}^2 = 0.71; R - 1 = 0.01384$$



## 12.8 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02218^{+0.00045}_{-0.00044}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.019}_{-0.018}$       | $H(0.38)$                   | $83.3^{+1.3}_{-1.3}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1196^{+0.0046}_{-0.0042}$    | $\sigma_8/h^{0.5}$                    | $0.984^{+0.026}_{-0.024}$       | $D_{\mathrm{M}}(0.38)$      | $1524^{+27}_{-26}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04094^{+0.00097}_{-0.00098}$ | $r_{\mathrm{drag}} h$                 | $100.0^{+2.0}_{-2.0}$           | $H(0.51)$                   | $90.0^{+1.4}_{-1.3}$         |
| $\tau$                                   | $0.054^{+0.014}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$           | $2.429^{+0.058}_{-0.055}$       | $D_{\mathrm{M}}(0.51)$      | $1975^{+33}_{-33}$           |
| $\Omega_K$                               | $0.0011^{+0.0051}_{-0.0050}$    | $z_{\mathrm{re}}$                     | $< 8.92$                        | $H(0.61)$                   | $95.6^{+1.4}_{-1.4}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.029}_{-0.027}$       | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.062}_{-0.056}$       | $D_{\mathrm{M}}(0.61)$      | $2298^{+38}_{-37}$           |
| $n_{\mathrm{s}}$                         | $0.966^{+0.012}_{-0.012}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.028}_{-0.027}$       | $H(2.33)$                   | $236.4^{+3.7}_{-3.5}$        |
| $y_{\mathrm{cal}}$                       | $1.0003^{+0.0048}_{-0.0049}$    | $D_{40}$                              | $1224^{+32}_{-31}$              | $D_{\mathrm{M}}(2.33)$      | $5750^{+73}_{-75}$           |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{220}$                             | $5703^{+79}_{-81}$              | $f\sigma_8(0.15)$           | $0.455^{+0.017}_{-0.017}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                             | $2533^{+26}_{-27}$              | $\sigma_8(0.15)$            | $0.749^{+0.019}_{-0.017}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                            | $814^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.474^{+0.015}_{-0.014}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.6^{+3.7}_{-3.6}$           | $\sigma_8(0.38)$            | $0.664^{+0.017}_{-0.015}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.46$                        | $n_{\mathrm{s},0.002}$                | $0.966^{+0.012}_{-0.012}$       | $f\sigma_8(0.51)$           | $0.473^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00018}_{-0.00021}$ | $\sigma_8(0.51)$            | $0.622^{+0.015}_{-0.014}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.61)$           | $0.468^{+0.013}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.622^{+0.085}_{-0.083}$       | $\sigma_8(0.61)$            | $0.592^{+0.015}_{-0.013}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.76^{+0.19}_{-0.19}$         | $f\sigma_8(2.33)$           | $0.2983^{+0.0071}_{-0.0064}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_*$                                 | $1090.13^{+0.86}_{-0.83}$       | $\sigma_8(2.33)$            | $0.3078^{+0.0079}_{-0.0072}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $r_*$                                 | $144.67^{+0.95}_{-1.0}$         | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04114^{+0.00095}_{-0.00096}$ | $f_{2000}^{217}$            | $107.5^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.895^{+0.087}_{-0.092}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.47^{+0.92}_{-0.87}$       | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.7)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.40^{+0.94}_{-0.98}$        | $\chi_{\mathrm{lowl}}^2$    | $23.2 (\nu: 1.0)$            |
| $H_0$                                    | $67.9^{+1.4}_{-1.4}$            | $k_{\mathrm{D}}$                      | $0.1404^{+0.0010}_{-0.0010}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7064.1 (\nu: 14.5)$         |
| $\Omega_{\Lambda}$                       | $0.689^{+0.015}_{-0.016}$       | $100\theta_{\mathrm{D}}$              | $0.16104^{+0.00051}_{-0.00051}$ | $\chi_{6\mathrm{DF}}^2$     | $0.052 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.015}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3389^{+100}_{-95}$             | $\chi_{\mathrm{MGS}}^2$     | $1.53 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1425^{+0.0043}_{-0.0040}$    | $k_{\mathrm{eq}}$                     | $0.01034^{+0.00031}_{-0.00029}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.5 (\nu: 1.5)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0967^{+0.0037}_{-0.0034}$    | $100\theta_{\mathrm{eq}}$             | $0.815^{+0.018}_{-0.019}$       | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 5.6)$             |
| $\sigma_8$                               | $0.810^{+0.021}_{-0.019}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4505^{+0.0094}_{-0.0098}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 1.2)$             |
| $S_8$                                    | $0.823^{+0.034}_{-0.032}$       | $H(0.15)$                             | $73.1^{+1.3}_{-1.3}$            | $\chi_{\mathrm{CMB}}^2$     | $7484.3 (\nu: 14.7)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.451^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$                | $639^{+12}_{-12}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7497.90; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.58; R - 1 = 0.01053$$



## 12.9 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02218^{+0.00045}_{-0.00042}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.2^{+1.3}_{-1.3}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1198^{+0.0039}_{-0.0038}$    | $\sigma_8/h^{0.5}$                    | $0.986^{+0.019}_{-0.019}$       | $D_{\mathrm{M}}(0.38)$      | $1525^{+27}_{-26}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04092^{+0.00093}_{-0.00094}$ | $r_{\mathrm{drag}} h$                 | $99.9^{+1.9}_{-1.9}$            | $H(0.51)$                   | $89.9^{+1.4}_{-1.3}$         |
| $\tau$                                   | $0.055^{+0.014}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.435^{+0.043}_{-0.042}$       | $D_{\mathrm{M}}(0.51)$      | $1976^{+33}_{-33}$           |
| $\Omega_K$                               | $0.0011^{+0.0049}_{-0.0049}$    | $z_{\mathrm{re}}$                     | $< 8.99$                        | $H(0.61)$                   | $95.6^{+1.4}_{-1.4}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.044^{+0.027}_{-0.026}$       | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.057}_{-0.054}$       | $D_{\mathrm{M}}(0.61)$      | $2300^{+38}_{-38}$           |
| $n_{\mathrm{s}}$                         | $0.965^{+0.011}_{-0.011}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.025}_{-0.024}$       | $H(2.33)$                   | $236.5^{+3.3}_{-3.3}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0047}_{-0.0050}$    | $D_{40}$                              | $1227^{+29}_{-28}$              | $D_{\mathrm{M}}(2.33)$      | $5751^{+72}_{-74}$           |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{220}$                             | $5708^{+81}_{-83}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                             | $2534^{+26}_{-27}$              | $\sigma_8(0.15)$            | $0.750^{+0.015}_{-0.015}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+20}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.7^{+3.7}_{-3.6}$           | $\sigma_8(0.38)$            | $0.665^{+0.014}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.52$                        | $n_{\mathrm{s},0.002}$                | $0.965^{+0.011}_{-0.011}$       | $f\sigma_8(0.51)$           | $0.474^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00018}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.623^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$           | $0.4692^{+0.0094}_{-0.0095}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.622^{+0.081}_{-0.083}$       | $\sigma_8(0.61)$            | $0.592^{+0.012}_{-0.012}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.77^{+0.19}_{-0.19}$         | $f\sigma_8(2.33)$           | $0.2987^{+0.0063}_{-0.0059}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $z_*$                                 | $1090.14^{+0.79}_{-0.80}$       | $\sigma_8(2.33)$            | $0.3082^{+0.0072}_{-0.0068}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.34}$          | $r_*$                                 | $144.63^{+0.86}_{-0.87}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.19}_{-0.20}$          | $100\theta_*$                         | $1.04112^{+0.00092}_{-0.00093}$ | $f_{2000}^{217}$            | $107.5^{+4.0}_{-3.9}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.892^{+0.078}_{-0.079}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.48^{+0.87}_{-0.88}$       | $\chi_{\mathrm{lensing}}^2$ | $9.43 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0012^{+0.0030}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.36^{+0.86}_{-0.86}$        | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.9)$           |
| $H_0$                                    | $67.8^{+1.4}_{-1.3}$            | $k_{\mathrm{D}}$                      | $0.14044^{+0.00095}_{-0.00096}$ | $\chi_{\mathrm{lowl}}^2$    | $23.4 (\nu: 0.8)$            |
| $\Omega_{\Lambda}$                       | $0.689^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{D}}$              | $0.16103^{+0.00051}_{-0.00050}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.4 (\nu: 13.2)$         |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.013}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3393^{+88}_{-86}$              | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                | $0.1426^{+0.0037}_{-0.0036}$    | $k_{\mathrm{eq}}$                     | $0.01035^{+0.00027}_{-0.00026}$ | $\chi_{\mathrm{MGS}}^2$     | $1.45 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0967^{+0.0035}_{-0.0033}$    | $100\theta_{\mathrm{eq}}$             | $0.815^{+0.017}_{-0.017}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 1.7)$             |
| $\sigma_8$                               | $0.812^{+0.016}_{-0.016}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4502^{+0.0085}_{-0.0085}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.6)$             |
| $S_8$                                    | $0.826^{+0.026}_{-0.025}$       | $H(0.15)$                             | $73.1^{+1.3}_{-1.3}$            | $\chi_{\mathrm{CMB}}^2$     | $7493.3 (\nu: 14.5)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.452^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$                | $640^{+12}_{-12}$               | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 1.2)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7506.97; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.65; R - 1 = 0.01641$$



12.10 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02219^{+0.00045}_{-0.00042}$ | $\sigma_8/h^{0.5}$                 | $0.985^{+0.018}_{-0.018}$       | $H(0.51)$                   | $90.0^{+1.4}_{-1.3}$         |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1196^{+0.0039}_{-0.0038}$    | $r_{\mathrm{drag}}h$               | $100.0^{+1.8}_{-1.8}$           | $D_{\mathrm{M}}(0.51)$      | $1975^{+33}_{-33}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04094^{+0.00093}_{-0.00095}$ | $\langle d^2 \rangle^{1/2}$        | $2.433^{+0.042}_{-0.042}$       | $H(0.61)$                   | $95.6^{+1.4}_{-1.4}$         |
| $\tau$                                   | $0.056^{+0.014}_{-0.013}$       | $z_{\mathrm{re}}$                  | $< 9.03$                        | $D_{\mathrm{M}}(0.61)$      | $2298^{+37}_{-38}$           |
| $\Omega_K$                               | $0.0010^{+0.0050}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$              | $2.100^{+0.058}_{-0.054}$       | $H(2.33)$                   | $236.4^{+3.3}_{-3.2}$        |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.044^{+0.028}_{-0.026}$       | $10^9 A_{\mathrm{s}}e^{-2\tau}$    | $1.878^{+0.025}_{-0.024}$       | $D_{\mathrm{M}}(2.33)$      | $5750^{+73}_{-74}$           |
| $n_{\mathrm{s}}$                         | $0.966^{+0.011}_{-0.011}$       | $D_{40}$                           | $1226^{+29}_{-28}$              | $f\sigma_8(0.15)$           | $0.456^{+0.013}_{-0.012}$    |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0047}_{-0.0050}$    | $D_{220}$                          | $5710^{+80}_{-83}$              | $\sigma_8(0.15)$            | $0.750^{+0.015}_{-0.015}$    |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{810}$                          | $2534^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                         | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.665^{+0.014}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                         | $229.8^{+3.7}_{-3.6}$           | $f\sigma_8(0.51)$           | $0.4736^{+0.0099}_{-0.0099}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.966^{+0.011}_{-0.011}$       | $\sigma_8(0.51)$            | $0.623^{+0.013}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.52$                        | $Y_{\mathrm{P}}$                   | $0.24532^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$           | $0.4688^{+0.0094}_{-0.0094}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24665^{+0.00018}_{-0.00020}$ | $\sigma_8(0.61)$            | $0.592^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.619^{+0.081}_{-0.083}$       | $f\sigma_8(2.33)$           | $0.2988^{+0.0063}_{-0.0059}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | Age/Gyr                            | $13.76^{+0.19}_{-0.19}$         | $\sigma_8(2.33)$            | $0.3083^{+0.0072}_{-0.0067}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1090.11^{+0.78}_{-0.79}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | $r_*$                              | $144.66^{+0.85}_{-0.85}$        | $f_{2000}^{217}$            | $107.5^{+4.1}_{-4.0}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.34}$          | $100\theta_*$                      | $1.04115^{+0.00091}_{-0.00093}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.895^{+0.078}_{-0.079}$      | $\chi_{\mathrm{lensing}}^2$ | $9.44 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                | $1059.50^{+0.89}_{-0.86}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 2.0)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $r_{\mathrm{drag}}$                | $147.39^{+0.86}_{-0.85}$        | $\chi_{\mathrm{lowl}}^2$    | $23.3 (\nu: 0.8)$            |
| $c_{217}$                                | $1.0012^{+0.0030}_{-0.0030}$    | $k_{\mathrm{D}}$                   | $0.14042^{+0.00094}_{-0.00096}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.5 (\nu: 13.3)$         |
| $H_0$                                    | $67.9^{+1.3}_{-1.3}$            | $100\theta_{\mathrm{D}}$           | $0.16102^{+0.00050}_{-0.00050}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.06 (\nu: 0.0)$         |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.013}$       | $z_{\mathrm{eq}}$                  | $3389^{+87}_{-84}$              | $\chi_{6\mathrm{DF}}^2$     | $0.047 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.013}_{-0.012}$       | $k_{\mathrm{eq}}$                  | $0.01034^{+0.00027}_{-0.00026}$ | $\chi_{\mathrm{MGS}}^2$     | $1.51 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1425^{+0.0037}_{-0.0035}$    | $100\theta_{\mathrm{eq}}$          | $0.815^{+0.016}_{-0.016}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $4.4 (\nu: 1.4)$             |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0967^{+0.0035}_{-0.0033}$    | $100\theta_{\mathrm{s,eq}}$        | $0.4505^{+0.0085}_{-0.0084}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.6)$             |
| $\sigma_8$                               | $0.811^{+0.016}_{-0.016}$       | $H(0.15)$                          | $73.1^{+1.3}_{-1.3}$            | $\chi_{\mathrm{CMB}}^2$     | $7493.4 (\nu: 14.4)$         |
| $S_8$                                    | $0.824^{+0.025}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$             | $639^{+12}_{-12}$               | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 1.0)$             |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.451^{+0.014}_{-0.013}$       | $H(0.38)$                          | $83.2^{+1.3}_{-1.3}$            |                             |                              |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$     | $0.605^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$             | $1524^{+26}_{-26}$              |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8542.02; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.67; R - 1 = 0.01706$$



## 12.11 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022328 | $0.02232^{+0.00032}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4488   | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | 83.29    | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_c h^2$              | 0.11934  | $0.1192^{+0.0030}_{-0.0028}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6022   | $0.602^{+0.015}_{-0.014}$       | $D_M(0.38)$                 | 1523.0   | $1525^{+26}_{-26}$           |
| $100\theta_{MC}$            | 1.04093  | $1.04092^{+0.00062}_{-0.00063}$ | $\sigma_8/h^{0.5}$          | 0.9805   | $0.980^{+0.021}_{-0.020}$       | $H(0.51)$                   | 89.99    | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                      | 0.0531   | $0.053^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 100.08   | $100.0^{+2.0}_{-1.9}$           | $D_M(0.51)$                 | 1973.4   | $1975^{+32}_{-32}$           |
| $\Omega_K$                  | 0.00079  | $0.0005^{+0.0038}_{-0.0039}$    | $\langle d^2 \rangle^{1/2}$ | 2.4229   | $2.423^{+0.049}_{-0.048}$       | $H(0.61)$                   | 95.60    | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10} A_s)$          | 3.0392   | $3.038^{+0.032}_{-0.032}$       | $z_{re}$                    | 7.56     | $7.5^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2296.7   | $2299^{+36}_{-36}$           |
| $n_s$                       | 0.9672   | $0.9668^{+0.0090}_{-0.0090}$    | $10^9 A_s$                  | 2.089    | $2.088^{+0.067}_{-0.066}$       | $H(2.33)$                   | 236.27   | $236.1^{+2.5}_{-2.4}$        |
| $y_{cal}$                   | 1.00054  | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | 1.8784   | $1.877^{+0.024}_{-0.022}$       | $D_M(2.33)$                 | 5749     | $5753^{+61}_{-62}$           |
| $A_{100}^{PS}$              | 234.6    | $240^{+50}_{-50}$               | $D_{40}$                    | 1223.3   | $1223^{+26}_{-25}$              | $f\sigma_8(0.15)$           | 0.4535   | $0.453^{+0.013}_{-0.013}$    |
| $A_{143}^{PS}$              | 49.2     | $39^{+20}_{-20}$                | $D_{220}$                   | 5719     | $5720^{+75}_{-76}$              | $\sigma_8(0.15)$            | 0.7471   | $0.746^{+0.015}_{-0.015}$    |
| $A_{217}^{PS}$              | 105.6    | $102^{+30}_{-30}$               | $D_{810}$                   | 2537.3   | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | 0.4725   | $0.472^{+0.012}_{-0.011}$    |
| $A_{217}^{CIB}$             | 39.9     | $40^{+10}_{-10}$                | $D_{1420}$                  | 816.9    | $815.8^{+9.2}_{-9.3}$           | $\sigma_8(0.38)$            | 0.6626   | $0.662^{+0.014}_{-0.013}$    |
| $A_{143}^{tSZ}$             | 4.97     | $< 7.52$                        | $D_{2000}$                  | 230.71   | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4714   | $0.471^{+0.011}_{-0.010}$    |
| $r_{143 \times 217}^{PS}$   | 0.758    | $0.66^{+0.25}_{-0.26}$          | $n_{s,0.002}$               | 0.9672   | $0.9668^{+0.0090}_{-0.0090}$    | $\sigma_8(0.51)$            | 0.6203   | $0.619^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{CIB}$  | 0.71     | —                               | $Y_P$                       | 0.245378 | $0.24538^{+0.00012}_{-0.00014}$ | $f\sigma_8(0.61)$           | 0.4667   | $0.466^{+0.010}_{-0.0099}$   |
| $\xi^{tSZ \times CIB}$      | 0.95     | —                               | $Y_P^{BBN}$                 | 0.246705 | $0.24670^{+0.00012}_{-0.00014}$ | $\sigma_8(0.61)$            | 0.5903   | $0.590^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | 2.5      | —                               | $10^5 D/H$                  | 2.593    | $2.595^{+0.062}_{-0.057}$       | $f\sigma_8(2.33)$           | 0.2977   | $0.2973^{+0.0062}_{-0.0060}$ |
| $A_{100}^{dust}$            | 1.008    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.761   | $13.77^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | 0.3072   | $0.3067^{+0.0069}_{-0.0067}$ |
| $A_{143}^{dust}$            | 0.952    | $0.97^{+0.34}_{-0.35}$          | $z_*$                       | 1089.92  | $1089.91^{+0.61}_{-0.57}$       | $f_{2000}^{143}$            | 29.7     | $30^{+6}_{-5}$               |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.21}_{-0.20}$          | $r_*$                       | 144.63   | $144.67^{+0.63}_{-0.64}$        | $f_{2000}^{217}$            | 106.35   | $106.8^{+3.8}_{-3.7}$        |
| $A_{143 \times 217}^{dust}$ | 1.019    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04111  | $1.04111^{+0.00061}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | 32.07    | $32^{+4}_{-4}$               |
| $c_{100}$                   | 0.99785  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.892   | $13.896^{+0.059}_{-0.059}$      | $\chi_{simall}^2$           | 395.85   | $396.9 (\nu: 1.4)$           |
| $c_{217}$                   | 1.00095  | $1.0011^{+0.0030}_{-0.0030}$    | $z_{drag}$                  | 1059.78  | $1059.77^{+0.66}_{-0.64}$       | $\chi_{lowl}^2$             | 22.88    | $23.0 (\nu: 0.5)$            |
| $c_{TE}$                    | 0.9969   | $0.9966^{+0.0098}_{-0.0097}$    | $r_{drag}$                  | 147.31   | $147.35^{+0.62}_{-0.63}$        | $\chi_{CamSpec}^2$          | 11500.8  | $11514.9 (\nu: 15.9)$        |
| $c_{EE}$                    | 0.9922   | $0.9921^{+0.0096}_{-0.0094}$    | $k_D$                       | 0.14060  | $0.14056^{+0.00067}_{-0.00067}$ | $\chi_{6DF}^2$              | 0.006    | $0.052 (\nu: 0.0)$           |
| $H_0$                       | 67.94    | $67.9^{+1.3}_{-1.3}$            | $100\theta_D$               | 0.160838 | $0.16085^{+0.00038}_{-0.00037}$ | $\chi_{MGS}^2$              | 1.47     | $1.50 (\nu: 0.2)$            |
| $\Omega_\Lambda$            | 0.6909   | $0.691^{+0.012}_{-0.012}$       | $z_{eq}$                    | 3385     | $3382^{+67}_{-63}$              | $\chi_{DR12BAO}^2$          | 3.65     | $4.6 (\nu: 1.7)$             |
| $\Omega_m$                  | 0.3083   | $0.309^{+0.013}_{-0.013}$       | $k_{eq}$                    | 0.010333 | $0.01032^{+0.00020}_{-0.00019}$ | $\chi_{prior}^2$            | 1.8      | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^2$              | 0.14231  | $0.1422^{+0.0028}_{-0.0027}$    | $100\theta_{eq}$            | 0.8162   | $0.817^{+0.012}_{-0.013}$       | $\chi_{BAO}^2$              | 5.13     | $6.2 (\nu: 1.2)$             |
| $\Omega_m h^3$              | 0.09668  | $0.0965^{+0.0027}_{-0.0026}$    | $100\theta_{s,eq}$          | 0.4509   | $0.4512^{+0.0062}_{-0.0064}$    | $\chi_{CMB}^2$              | 11919.5  | $11934.9 (\nu: 16.6)$        |
| $\sigma_8$                  | 0.8082   | $0.807^{+0.017}_{-0.016}$       | $H(0.15)$                   | 73.20    | $73.1^{+1.3}_{-1.3}$            |                             |          |                              |
| $S_8$                       | 0.8193   | $0.819^{+0.026}_{-0.025}$       | $D_M(0.15)$                 | 638.3    | $639^{+12}_{-12}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11926.45$ ;  $\bar{\chi}_{\text{eff}}^2 = 11948.83$ ;  $\Delta\chi_{\text{eff}}^2 = 0.54$ ;  $R - 1 = 0.01869$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.01 MGS: 1.47 DR12BAO: 3.65 CMB - simall-100x143.offlike5\_EE\_Aplanck.B: 395.85 commander\_dx12\_v3\_2\_29: 22.88 CamSpec like\_10.7HM\_1400\_unified: 11500.78



## 12.12 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00031}_{-0.00033}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1193^{+0.0029}_{-0.0027}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1526^{+25}_{-25}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00062}_{-0.00063}$ | $\sigma_8/h^{0.5}$                    | $0.983^{+0.017}_{-0.017}$       | $H(0.51)$                   | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                                   | $0.055^{+0.015}_{-0.014}$       | $r_{\mathrm{drag}} h$                 | $99.9^{+1.9}_{-1.8}$            | $D_{\mathrm{M}}(0.51)$      | $1977^{+31}_{-32}$           |
| $\Omega_K$                               | $0.0005^{+0.0038}_{-0.0040}$    | $\langle d^2 \rangle^{1/2}$           | $2.431^{+0.040}_{-0.040}$       | $H(0.61)$                   | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.043^{+0.028}_{-0.028}$       | $z_{\mathrm{re}}$                     | $7.7^{+1.4}_{-1.5}$             | $D_{\mathrm{M}}(0.61)$      | $2301^{+35}_{-36}$           |
| $n_{\mathrm{s}}$                         | $0.9665^{+0.0089}_{-0.0090}$    | $10^9 A_{\mathrm{s}}$                 | $2.097^{+0.059}_{-0.059}$       | $H(2.33)$                   | $236.2^{+2.4}_{-2.4}$        |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0047}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.023}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5755^{+62}_{-63}$           |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                              | $1225^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5724^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2536^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4737^{+0.0095}_{-0.0095}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $816.1^{+9.1}_{-9.3}$           | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.53$                        | $D_{2000}$                            | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4725^{+0.0086}_{-0.0088}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9665^{+0.0089}_{-0.0090}$    | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4677^{+0.0084}_{-0.0084}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24670^{+0.00013}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.011}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.594^{+0.062}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.2979^{+0.0058}_{-0.0057}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.78^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | $0.3073^{+0.0066}_{-0.0065}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $z_*$                                 | $1089.92^{+0.61}_{-0.55}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                 | $144.64^{+0.61}_{-0.62}$        | $f_{2000}^{217}$            | $106.8^{+3.9}_{-3.8}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.32}$          | $100\theta_*$                         | $1.04110^{+0.00060}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.893^{+0.057}_{-0.058}$      | $\chi_{\mathrm{lensing}}^2$ | $9.31 (\nu: 0.3)$            |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.79^{+0.64}_{-0.65}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.5)$           |
| $c_{TE}$                                 | $0.9965^{+0.0096}_{-0.0098}$    | $r_{\mathrm{drag}}$                   | $147.32^{+0.61}_{-0.61}$        | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 0.5)$            |
| $c_{EE}$                                 | $0.9921^{+0.0098}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14059^{+0.00065}_{-0.00066}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.4 (\nu: 15.7)$        |
| $H_0$                                    | $67.8^{+1.3}_{-1.3}$            | $100\theta_{\mathrm{D}}$              | $0.16084^{+0.00039}_{-0.00037}$ | $\chi_{6\mathrm{DF}}^2$     | $0.056 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.690^{+0.011}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3385^{+64}_{-62}$              | $\chi_{\mathrm{MGS}}^2$     | $1.42 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00020}_{-0.00019}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.9)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1423^{+0.0027}_{-0.0026}$    | $100\theta_{\mathrm{eq}}$             | $0.816^{+0.012}_{-0.012}$       | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.1)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0965^{+0.0027}_{-0.0026}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4510^{+0.0061}_{-0.0062}$    | $\chi_{\mathrm{CMB}}^2$     | $11943.9 (\nu: 17.2)$        |
| $\sigma_8$                               | $0.809^{+0.014}_{-0.014}$       | $H(0.15)$                             | $73.1^{+1.3}_{-1.2}$            | $\chi_{\mathrm{BAO}}^2$     | $6.2 (\nu: 1.3)$             |
| $S_8$                                    | $0.822^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$                | $640^{+12}_{-11}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11957.96; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.56; R - 1 = 0.03026$$



### 12.13 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02233^{+0.00031}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_c h^2$                       | $0.1192^{+0.0028}_{-0.0027}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | $1525^{+25}_{-25}$           |
| $100\theta_{MC}$                     | $1.04092^{+0.00062}_{-0.00063}$ | $\sigma_8/h^{0.5}$          | $0.982^{+0.017}_{-0.017}$       | $H(0.51)$                   | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                               | $0.055^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$         | $99.97^{+1.8}_{-1.8}$           | $D_M(0.51)$                 | $1976^{+31}_{-31}$           |
| $\Omega_K$                           | $0.0005^{+0.0038}_{-0.0039}$    | $\langle d^2 \rangle^{1/2}$ | $2.430^{+0.039}_{-0.039}$       | $H(0.61)$                   | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.028}_{-0.028}$       | $z_{\text{re}}$             | $7.8^{+1.4}_{-1.5}$             | $D_M(0.61)$                 | $2299^{+35}_{-35}$           |
| $n_s$                                | $0.9667^{+0.0089}_{-0.0090}$    | $10^9 A_s$                  | $2.098^{+0.059}_{-0.059}$       | $H(2.33)$                   | $236.2^{+2.4}_{-2.4}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0047}$    | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.023}_{-0.021}$       | $D_M(2.33)$                 | $5753^{+62}_{-63}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                    | $1225^{+24}_{-24}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                   | $5725^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                   | $2536^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4734^{+0.0092}_{-0.0093}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                  | $816.2^{+9.1}_{-9.3}$           | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.54$                        | $D_{2000}$                  | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4723^{+0.0086}_{-0.0088}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | $0.9667^{+0.0089}_{-0.0090}$    | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4675^{+0.0082}_{-0.0083}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$    | $2.593^{+0.061}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.2980^{+0.0058}_{-0.0058}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$     | $13.77^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | $0.3075^{+0.0066}_{-0.0065}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | $1089.90^{+0.59}_{-0.55}$       | $f_{2000}^{143}$            | $30^{+5}_{-5}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $r_*$                       | $144.66^{+0.61}_{-0.61}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.32}$          | $100\theta_*$               | $1.04110^{+0.00060}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.894^{+0.056}_{-0.056}$      | $\chi_{\text{lensing}}^2$   | $9.33 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\text{drag}}$           | $1059.80^{+0.63}_{-0.66}$       | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                             | $0.9965^{+0.0096}_{-0.0098}$    | $r_{\text{drag}}$           | $147.33^{+0.60}_{-0.59}$        | $\chi_{\text{lowl}}^2$      | $23.1 (\nu: 0.5)$            |
| $c_{EE}$                             | $0.9921^{+0.0098}_{-0.0096}$    | $k_D$                       | $0.14058^{+0.00065}_{-0.00066}$ | $\chi_{\text{CamSpec}}^2$   | $11514.4 (\nu: 15.6)$        |
| $H_0$                                | $67.9^{+1.3}_{-1.3}$            | $100\theta_D$               | $0.16083^{+0.00038}_{-0.00036}$ | $\chi_{\text{JLA}}^2$       | $1035.02 (\nu: 0.0)$         |
| $\Omega_\Lambda$                     | $0.691^{+0.011}_{-0.011}$       | $z_{\text{eq}}$             | $3383^{+63}_{-61}$              | $\chi_{6\text{DF}}^2$       | $0.048 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.309^{+0.012}_{-0.011}$       | $k_{\text{eq}}$             | $0.01033^{+0.00019}_{-0.00019}$ | $\chi_{\text{MGS}}^2$       | $1.48 (\nu: 0.2)$            |
| $\Omega_m h^2$                       | $0.1422^{+0.0027}_{-0.0026}$    | $100\theta_{\text{eq}}$     | $0.817^{+0.012}_{-0.012}$       | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.5)$             |
| $\Omega_m h^3$                       | $0.0965^{+0.0027}_{-0.0027}$    | $100\theta_{s,\text{eq}}$   | $0.4511^{+0.0061}_{-0.0061}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.809^{+0.014}_{-0.014}$       | $H(0.15)$                   | $73.1^{+1.2}_{-1.2}$            | $\chi_{\text{CMB}}^2$       | $11944.0 (\nu: 17.0)$        |
| $S_8$                                | $0.821^{+0.021}_{-0.020}$       | $D_M(0.15)$                 | $639^{+11}_{-11}$               | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 1.1)$             |

$$\bar{\chi}_{\text{eff}}^2 = 12992.90; \Delta\bar{\chi}_{\text{eff}}^2 = 0.51; R - 1 = 0.03012$$



## 12.14 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00031}_{-0.00032}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.449^{+0.014}_{-0.013}$       | $H(0.38)$                   | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1192^{+0.0030}_{-0.0028}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.602^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$      | $1524^{+26}_{-26}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04092^{+0.00062}_{-0.00063}$ | $\sigma_8/h^{0.5}$                    | $0.981^{+0.020}_{-0.019}$       | $H(0.51)$                   | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $100.0^{+2.0}_{-1.9}$           | $D_{\mathrm{M}}(0.51)$      | $1975^{+32}_{-32}$           |
| $\Omega_K$                               | $0.0005^{+0.0038}_{-0.0039}$    | $\langle d^2 \rangle^{1/2}$           | $2.426^{+0.047}_{-0.045}$       | $H(0.61)$                   | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                     | $< 8.87$                        | $D_{\mathrm{M}}(0.61)$      | $2299^{+36}_{-36}$           |
| $n_{\mathrm{s}}$                         | $0.9669^{+0.0089}_{-0.0090}$    | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.059}_{-0.054}$       | $H(2.33)$                   | $236.1^{+2.5}_{-2.4}$        |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.024}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5753^{+62}_{-62}$           |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                              | $1223^{+26}_{-25}$              | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5719^{+75}_{-76}$              | $\sigma_8(0.15)$            | $0.747^{+0.015}_{-0.014}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $815.8^{+9.1}_{-9.4}$           | $\sigma_8(0.38)$            | $0.663^{+0.013}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.54$                        | $D_{2000}$                            | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.9669^{+0.0089}_{-0.0090}$    | $\sigma_8(0.51)$            | $0.620^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4669^{+0.0099}_{-0.0093}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24670^{+0.00013}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.590^{+0.012}_{-0.011}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.594^{+0.061}_{-0.057}$       | $f\sigma_8(2.33)$           | $0.2977^{+0.0060}_{-0.0055}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.77^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | $0.3072^{+0.0067}_{-0.0063}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.35}$          | $z_*$                                 | $1089.90^{+0.60}_{-0.57}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                 | $144.68^{+0.64}_{-0.64}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.7}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$                         | $1.04111^{+0.00061}_{-0.00061}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.896^{+0.059}_{-0.059}$      | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.78^{+0.65}_{-0.65}$       | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 0.5)$            |
| $c_{TE}$                                 | $0.9965^{+0.0097}_{-0.0096}$    | $r_{\mathrm{drag}}$                   | $147.36^{+0.63}_{-0.63}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.7 (\nu: 15.7)$        |
| $c_{EE}$                                 | $0.9921^{+0.0096}_{-0.0094}$    | $k_{\mathrm{D}}$                      | $0.14056^{+0.00067}_{-0.00067}$ | $\chi_{6\mathrm{DF}}^2$     | $0.052 (\nu: 0.0)$           |
| $H_0$                                    | $67.9^{+1.3}_{-1.3}$            | $100\theta_{\mathrm{D}}$              | $0.16084^{+0.00038}_{-0.00037}$ | $\chi_{\mathrm{MGS}}^2$     | $1.51 (\nu: 0.2)$            |
| $\Omega_{\Lambda}$                       | $0.691^{+0.012}_{-0.012}$       | $z_{\mathrm{eq}}$                     | $3382^{+67}_{-64}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 1.7)$             |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.013}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01032^{+0.00020}_{-0.00019}$ | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1422^{+0.0028}_{-0.0027}$    | $100\theta_{\mathrm{eq}}$             | $0.817^{+0.012}_{-0.013}$       | $\chi_{\mathrm{BAO}}^2$     | $6.2 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0965^{+0.0028}_{-0.0026}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4513^{+0.0063}_{-0.0064}$    | $\chi_{\mathrm{CMB}}^2$     | $11934.6 (\nu: 16.2)$        |
| $\sigma_8$                               | $0.808^{+0.016}_{-0.015}$       | $H(0.15)$                             | $73.1^{+1.3}_{-1.3}$            |                             |                              |
| $S_8$                                    | $0.820^{+0.025}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$                | $639^{+12}_{-12}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.57; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.58; R - 1 = 0.01907$$



12.15 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02233^{+0.00031}_{-0.00033}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.012}_{-0.011}$       | $H(0.38)$                   | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1193^{+0.0029}_{-0.0027}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1526^{+26}_{-25}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00063}_{-0.00062}$ | $\sigma_8/h^{0.5}$                   | $0.983^{+0.016}_{-0.016}$       | $H(0.51)$                   | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                                   | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}}h$                 | $99.9^{+1.9}_{-1.8}$            | $D_{\mathrm{M}}(0.51)$      | $1977^{+32}_{-32}$           |
| $\Omega_K$                               | $0.0005^{+0.0038}_{-0.0040}$    | $\langle d^2 \rangle^{1/2}$          | $2.432^{+0.039}_{-0.038}$       | $H(0.61)$                   | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.044^{+0.027}_{-0.024}$       | $z_{\mathrm{re}}$                    | $7.8^{+1.2}_{-1.3}$             | $D_{\mathrm{M}}(0.61)$      | $2301^{+35}_{-36}$           |
| $n_{\mathrm{s}}$                         | $0.9666^{+0.0090}_{-0.0091}$    | $10^9 A_{\mathrm{s}}$                | $2.100^{+0.055}_{-0.052}$       | $H(2.33)$                   | $236.2^{+2.4}_{-2.4}$        |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0049}_{-0.0047}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5755^{+62}_{-63}$           |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                             | $1225^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                            | $5724^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                            | $2535^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4739^{+0.0093}_{-0.0093}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                           | $816.1^{+9.0}_{-9.3}$           | $\sigma_8(0.38)$            | $0.664^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.56$                        | $D_{2000}$                           | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4728^{+0.0086}_{-0.0085}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $n_{\mathrm{s},0.002}$               | $0.9666^{+0.0090}_{-0.0091}$    | $\sigma_8(0.51)$            | $0.621^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4679^{+0.0082}_{-0.0081}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.011}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.594^{+0.062}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.2981^{+0.0057}_{-0.0054}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.78^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | $0.3075^{+0.0065}_{-0.0063}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.91^{+0.59}_{-0.55}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.21}_{-0.20}$          | $r_*$                                | $144.65^{+0.61}_{-0.61}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.32}$          | $100\theta_*$                        | $1.04110^{+0.00060}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.894^{+0.057}_{-0.058}$      | $\chi_{\mathrm{lensing}}^2$ | $9.26 (\nu: 0.2)$            |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.79^{+0.64}_{-0.66}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.6)$           |
| $c_{TE}$                                 | $0.9964^{+0.0096}_{-0.0098}$    | $r_{\mathrm{drag}}$                  | $147.32^{+0.60}_{-0.60}$        | $\chi_{\mathrm{lowl}}^2$    | $23.1 (\nu: 0.5)$            |
| $c_{EE}$                                 | $0.9920^{+0.0098}_{-0.0095}$    | $k_{\mathrm{D}}$                     | $0.14059^{+0.00065}_{-0.00066}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.3 (\nu: 15.6)$        |
| $H_0$                                    | $67.8^{+1.3}_{-1.3}$            | $100\theta_{\mathrm{D}}$             | $0.16084^{+0.00038}_{-0.00036}$ | $\chi_{6\mathrm{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.690^{+0.011}_{-0.011}$       | $z_{\mathrm{eq}}$                    | $3384^{+65}_{-62}$              | $\chi_{\mathrm{MGS}}^2$     | $1.43 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                    | $0.01033^{+0.00020}_{-0.00019}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.9)$             |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1423^{+0.0027}_{-0.0026}$    | $100\theta_{\mathrm{eq}}$            | $0.816^{+0.012}_{-0.012}$       | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.2)$             |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0965^{+0.0028}_{-0.0026}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4510^{+0.0061}_{-0.0062}$    | $\chi_{\mathrm{CMB}}^2$     | $11943.7 (\nu: 16.8)$        |
| $\sigma_8$                               | $0.810^{+0.014}_{-0.014}$       | $H(0.15)$                            | $73.1^{+1.3}_{-1.2}$            | $\chi_{\mathrm{BAO}}^2$     | $6.2 (\nu: 1.3)$             |
| $S_8$                                    | $0.823^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$               | $640^{+12}_{-12}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11957.78; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.52; R - 1 = 0.03337$$



12.16 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_Pantheon18\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02234^{+0.00031}_{-0.00032}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.450^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.2^{+1.2}_{-1.2}$         |
| $\Omega_{\text{c}} h^2$              | $0.1192^{+0.0028}_{-0.0027}$    | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $D_{\text{M}}(0.38)$        | $1525^{+25}_{-25}$           |
| $100\theta_{\text{MC}}$              | $1.04092^{+0.00062}_{-0.00062}$ | $\sigma_8/h^{0.5}$                  | $0.983^{+0.017}_{-0.016}$       | $H(0.51)$                   | $89.9^{+1.2}_{-1.2}$         |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $r_{\text{drag}} h$                 | $99.99^{+1.8}_{-1.8}$           | $D_{\text{M}}(0.51)$        | $1975^{+31}_{-31}$           |
| $\Omega_K$                           | $0.0005^{+0.0038}_{-0.0039}$    | $\langle d^2 \rangle^{1/2}$         | $2.431^{+0.039}_{-0.038}$       | $H(0.61)$                   | $95.5^{+1.2}_{-1.2}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.045^{+0.027}_{-0.024}$       | $z_{\text{re}}$                     | $7.8^{+1.2}_{-1.3}$             | $D_{\text{M}}(0.61)$        | $2299^{+36}_{-35}$           |
| $n_{\text{s}}$                       | $0.9667^{+0.0089}_{-0.0090}$    | $10^9 A_{\text{s}}$                 | $2.101^{+0.055}_{-0.053}$       | $H(2.33)$                   | $236.1^{+2.4}_{-2.4}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0047}$    | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.878^{+0.022}_{-0.021}$       | $D_{\text{M}}(2.33)$        | $5753^{+63}_{-63}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                            | $1225^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.010}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                           | $5724^{+74}_{-75}$              | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                           | $2535^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.4736^{+0.0091}_{-0.0092}$ |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                          | $816.2^{+9.0}_{-9.3}$           | $\sigma_8(0.38)$            | $0.664^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.56$                        | $D_{2000}$                          | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.4725^{+0.0084}_{-0.0085}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $n_{\text{s},0.002}$                | $0.9667^{+0.0089}_{-0.0090}$    | $\sigma_8(0.51)$            | $0.621^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                      | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4677^{+0.0080}_{-0.0080}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24671^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5 \text{D}/\text{H}$            | $2.592^{+0.061}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.2982^{+0.0057}_{-0.0055}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\text{Age}/\text{Gyr}$             | $13.77^{+0.16}_{-0.16}$         | $\sigma_8(2.33)$            | $0.3077^{+0.0065}_{-0.0063}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_*$                               | $1089.90^{+0.58}_{-0.55}$       | $f_{2000}^{143}$            | $30^{+5}_{-5}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $r_*$                               | $144.66^{+0.61}_{-0.61}$        | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.32}$          | $100\theta_*$                       | $1.04111^{+0.00060}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.895^{+0.057}_{-0.055}$      | $\chi_{\text{lensing}}^2$   | $9.27 (\nu: 0.3)$            |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\text{drag}}$                   | $1059.80^{+0.63}_{-0.67}$       | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                             | $0.9964^{+0.0096}_{-0.0098}$    | $r_{\text{drag}}$                   | $147.34^{+0.60}_{-0.59}$        | $\chi_{\text{lowl}}^2$      | $23.1 (\nu: 0.5)$            |
| $c_{EE}$                             | $0.9921^{+0.0098}_{-0.0095}$    | $k_{\text{D}}$                      | $0.14058^{+0.00065}_{-0.00066}$ | $\chi_{\text{CamSpec}}^2$   | $11514.3 (\nu: 15.5)$        |
| $H_0$                                | $67.9^{+1.3}_{-1.3}$            | $100\theta_{\text{D}}$              | $0.16083^{+0.00038}_{-0.00036}$ | $\chi_{\text{JLA}}^2$       | $1035.01 (\nu: 0.0)$         |
| $\Omega_{\Lambda}$                   | $0.691^{+0.011}_{-0.011}$       | $z_{\text{eq}}$                     | $3383^{+63}_{-61}$              | $\chi_{6\text{DF}}^2$       | $0.048 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.309^{+0.012}_{-0.011}$       | $k_{\text{eq}}$                     | $0.01032^{+0.00019}_{-0.00019}$ | $\chi_{\text{MGS}}^2$       | $1.48 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1422^{+0.0027}_{-0.0025}$    | $100\theta_{\text{eq}}$             | $0.817^{+0.012}_{-0.012}$       | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.5)$             |
| $\Omega_{\text{m}} h^3$              | $0.0965^{+0.0027}_{-0.0027}$    | $100\theta_{\text{s,eq}}$           | $0.4512^{+0.0060}_{-0.0061}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.2)$             |
| $\sigma_8$                           | $0.810^{+0.014}_{-0.014}$       | $H(0.15)$                           | $73.1^{+1.3}_{-1.2}$            | $\chi_{\text{CMB}}^2$       | $11943.8 (\nu: 16.6)$        |
| $S_8$                                | $0.821^{+0.020}_{-0.020}$       | $D_{\text{M}}(0.15)$                | $639^{+12}_{-11}$               | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 1.1)$             |

$$\bar{\chi}_{\text{eff}}^2 = 12992.73; \Delta\bar{\chi}_{\text{eff}}^2 = 0.47; R - 1 = 0.03308$$



## 12.17 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_lensing

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022289 | $0.02235^{+0.00049}_{-0.00047}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4678   | $0.470^{+0.023}_{-0.024}$       | $H(0.15)$                   | 69.30    | $68.7^{+4.7}_{-4.4}$         |
| $\Omega_c h^2$                       | 0.11825  | $0.1177^{+0.0044}_{-0.0043}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6099   | $0.610^{+0.015}_{-0.014}$       | $D_M(0.15)$                 | 676.6    | $684^{+50}_{-47}$            |
| $100\theta_{MC}$                     | 1.04103  | $1.04119^{+0.00099}_{-0.00096}$ | $\sigma_8/h^{0.5}$          | 0.9950   | $0.996^{+0.021}_{-0.021}$       | $H(0.38)$                   | 79.65    | $79.0^{+4.4}_{-4.2}$         |
| $\tau$                               | 0.0498   | $0.049^{+0.016}_{-0.017}$       | $r_{\text{drag}} h$         | 94.3     | $93.4^{+7.0}_{-6.5}$            | $D_M(0.38)$                 | 1606     | $1623^{+110}_{-100}$         |
| $\Omega_K$                           | -0.0093  | $-0.012^{+0.015}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$ | 2.469    | $2.472^{+0.058}_{-0.058}$       | $H(0.51)$                   | 86.49    | $85.9^{+4.4}_{-4.1}$         |
| $\ln(10^{10} A_s)$                   | 3.0282   | $3.026^{+0.032}_{-0.034}$       | $z_{\text{re}}$             | 7.17     | $7.1^{+1.7}_{-1.8}$             | $D_M(0.51)$                 | 2076     | $2096^{+130}_{-130}$         |
| $n_s$                                | 0.9685   | $0.970^{+0.013}_{-0.012}$       | $10^9 A_s$                  | 2.066    | $2.062^{+0.067}_{-0.070}$       | $H(0.61)$                   | 92.20    | $91.6^{+4.3}_{-4.1}$         |
| $y_{\text{cal}}$                     | 1.00026  | $1.0001^{+0.0047}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | 1.8701   | $1.868^{+0.027}_{-0.026}$       | $D_M(0.61)$                 | 2411     | $2434^{+150}_{-140}$         |
| $A_{100}^{\text{PS}}$                | 241.9    | $240^{+50}_{-50}$               | $D_{40}$                    | 1213.8   | $1209^{+34}_{-33}$              | $H(2.33)$                   | 233.4    | $232.6^{+5.0}_{-5.0}$        |
| $A_{143}^{\text{PS}}$                | 36.4     | $38^{+20}_{-20}$                | $D_{220}$                   | 5711     | $5715^{+80}_{-80}$              | $D_M(2.33)$                 | 5926     | $5962^{+230}_{-230}$         |
| $A_{217}^{\text{PS}}$                | 98.4     | $101^{+30}_{-30}$               | $D_{810}$                   | 2529.2   | $2529^{+26}_{-27}$              | $f\sigma_8(0.15)$           | 0.4702   | $0.472^{+0.020}_{-0.021}$    |
| $A_{217}^{\text{CIB}}$               | 42.9     | $40^{+10}_{-10}$                | $D_{1420}$                  | 813.6    | $814.2^{+9.8}_{-9.9}$           | $\sigma_8(0.15)$            | 0.7315   | $0.727^{+0.027}_{-0.028}$    |
| $A_{143}^{\text{tSZ}}$               | 4.37     | $< 7.47$                        | $D_{2000}$                  | 230.02   | $230.3^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | 0.4811   | $0.481^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.565    | $0.65^{+0.26}_{-0.26}$          | $n_{s,0.002}$               | 0.9685   | $0.970^{+0.013}_{-0.012}$       | $\sigma_8(0.38)$            | 0.6446   | $0.640^{+0.028}_{-0.029}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.65     | —                               | $Y_P$                       | 0.245363 | $0.24538^{+0.00019}_{-0.00021}$ | $f\sigma_8(0.51)$           | 0.4759   | $0.4755^{+0.0099}_{-0.0097}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.07     | —                               | $Y_P^{\text{BBN}}$          | 0.246689 | $0.24671^{+0.00019}_{-0.00021}$ | $\sigma_8(0.51)$            | 0.6017   | $0.598^{+0.028}_{-0.028}$    |
| $A^{\text{kSZ}}$                     | 3.8      | —                               | $10^5 D/H$                  | 2.601    | $2.591^{+0.090}_{-0.089}$       | $f\sigma_8(0.61)$           | 0.4684   | $0.4675^{+0.0097}_{-0.0094}$ |
| $A_{100}^{\text{dust}}$              | 1.010    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 14.21    | $14.30^{+0.60}_{-0.58}$         | $\sigma_8(0.61)$            | 0.5715   | $0.567^{+0.028}_{-0.028}$    |
| $A_{143}^{\text{dust}}$              | 0.989    | $0.98^{+0.34}_{-0.35}$          | $z_*$                       | 1089.87  | $1089.75^{+0.90}_{-0.89}$       | $f\sigma_8(2.33)$           | 0.2872   | $0.285^{+0.015}_{-0.015}$    |
| $A_{217}^{\text{dust}}$              | 0.960    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.95   | $145.06^{+0.97}_{-0.96}$        | $\sigma_8(2.33)$            | 0.2936   | $0.291^{+0.018}_{-0.019}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.004    | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04123  | $1.04138^{+0.00097}_{-0.00094}$ | $f_{2000}^{143}$            | 30.3     | $30^{+6}_{-6}$               |
| $c_{100}$                            | 0.99735  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.921   | $13.929^{+0.088}_{-0.088}$      | $f_{2000}^{217}$            | 107.02   | $106.5^{+4.1}_{-4.2}$        |
| $c_{217}$                            | 1.00124  | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | 1059.63  | $1059.71^{+0.98}_{-0.92}$       | $f_{2000}^{143 \times 217}$ | 32.32    | $32^{+4}_{-5}$               |
| $H_0$                                | 63.86    | $63.2^{+4.9}_{-4.6}$            | $r_{\text{drag}}$           | 147.65   | $147.74^{+0.94}_{-0.94}$        | $\chi_{\text{lensing}}^2$   | 9.19     | $10.3 (\nu: 2.3)$            |
| $\Omega_\Lambda$                     | 0.6631   | $0.659^{+0.034}_{-0.036}$       | $k_D$                       | 0.14022  | $0.1402^{+0.0010}_{-0.00097}$   | $\chi_{\text{small}}^2$     | 395.64   | $396.8 (\nu: 1.2)$           |
| $\Omega_m$                           | 0.3461   | $0.353^{+0.050}_{-0.046}$       | $100\theta_D$               | 0.16094  | $0.16091^{+0.00054}_{-0.00054}$ | $\chi_{\text{lowl}}^2$      | 21.85    | $21.8 (\nu: 0.6)$            |
| $\Omega_m h^2$                       | 0.14118  | $0.1407^{+0.0041}_{-0.0041}$    | $z_{\text{eq}}$             | 3358     | $3346^{+98}_{-97}$              | $\chi_{\text{CamSpec}}^2$   | 7049.2   | $7062.9 (\nu: 15.3)$         |
| $\Omega_m h^3$                       | 0.0902   | $0.0889^{+0.0084}_{-0.0081}$    | $k_{\text{eq}}$             | 0.010250 | $0.01021^{+0.00030}_{-0.00030}$ | $\chi_{\text{prior}}^2$     | 2.4      | $7.5 (\nu: 5.9)$             |
| $\sigma_8$                           | 0.7952   | $0.791^{+0.025}_{-0.026}$       | $100\theta_{\text{eq}}$     | 0.8211   | $0.824^{+0.019}_{-0.019}$       | $\chi_{\text{CMB}}^2$       | 7475.9   | $7491.7 (\nu: 15.9)$         |
| $S_8$                                | 0.8542   | $0.858^{+0.042}_{-0.043}$       | $100\theta_{s,\text{eq}}$   | 0.4535   | $0.4549^{+0.0098}_{-0.0097}$    |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 7478.30$ ;  $\Delta\chi_{\text{eff}}^2 = -2.38$ ;  $\bar{\chi}_{\text{eff}}^2 = 7499.29$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -0.96$ ;  $R - 1 = 0.01550$   
 $\chi_{\text{eff}}^2$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 9.19 ( $\Delta$  0.27) simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.64 ( $\Delta$  -0.23) commander\_dx12\_v3.2.29: 21.85 ( $\Delta$  -1.57) CamSpec like\_10.7HM: 7049.24 ( $\Delta$  -0.94)



## 12.18 base\_omegak\_CamSpecHM\_TT\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02236^{+0.00050}_{-0.00047}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.469^{+0.023}_{-0.023}$       | $H(0.15)$                   | $69.0^{+4.6}_{-4.4}$         |
| $\Omega_{\mathrm{c}} h^2$                | $0.1176^{+0.0044}_{-0.0043}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.610^{+0.015}_{-0.015}$       | $D_{\mathrm{M}}(0.15)$      | $680^{+48}_{-46}$            |
| $100\theta_{\mathrm{MC}}$                | $1.0412^{+0.0010}_{-0.00097}$   | $\sigma_8/h^{0.5}$                    | $0.996^{+0.021}_{-0.022}$       | $H(0.38)$                   | $79.4^{+4.4}_{-4.2}$         |
| $\tau$                                   | $0.0528^{+0.012}_{-0.0097}$     | $r_{\mathrm{drag}} h$                 | $94.0^{+6.7}_{-6.4}$            | $D_{\mathrm{M}}(0.38)$      | $1614^{+100}_{-99}$          |
| $\Omega_K$                               | $-0.011^{+0.014}_{-0.015}$      | $\langle d^2 \rangle^{1/2}$           | $2.472^{+0.059}_{-0.059}$       | $H(0.51)$                   | $86.2^{+4.2}_{-4.1}$         |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.033^{+0.026}_{-0.023}$       | $z_{\mathrm{re}}$                     | $< 8.51$                        | $D_{\mathrm{M}}(0.51)$      | $2085^{+130}_{-120}$         |
| $n_{\mathrm{s}}$                         | $0.971^{+0.013}_{-0.012}$       | $10^9 A_{\mathrm{s}}$                 | $2.075^{+0.053}_{-0.048}$       | $H(0.61)$                   | $91.9^{+4.2}_{-4.0}$         |
| $y_{\mathrm{cal}}$                       | $1.0000^{+0.0047}_{-0.0050}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.867^{+0.027}_{-0.026}$       | $D_{\mathrm{M}}(0.61)$      | $2422^{+140}_{-140}$         |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                              | $1209^{+34}_{-33}$              | $H(2.33)$                   | $232.7^{+5.0}_{-5.0}$        |
| $A_{143}^{\mathrm{PS}}$                  | $38^{+20}_{-20}$                | $D_{220}$                             | $5714^{+81}_{-80}$              | $D_{\mathrm{M}}(2.33)$      | $5946^{+230}_{-220}$         |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{810}$                             | $2528^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.471^{+0.020}_{-0.021}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $814.2^{+9.9}_{-9.9}$           | $\sigma_8(0.15)$            | $0.730^{+0.025}_{-0.025}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.47$                        | $D_{2000}$                            | $230.4^{+3.6}_{-3.7}$           | $f\sigma_8(0.38)$           | $0.481^{+0.012}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.971^{+0.013}_{-0.012}$       | $\sigma_8(0.38)$            | $0.644^{+0.026}_{-0.026}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24539^{+0.00019}_{-0.00021}$ | $f\sigma_8(0.51)$           | $0.4759^{+0.0099}_{-0.0097}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00019}_{-0.00021}$ | $\sigma_8(0.51)$            | $0.601^{+0.026}_{-0.026}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.589^{+0.090}_{-0.090}$       | $f\sigma_8(0.61)$           | $0.4683^{+0.0095}_{-0.0088}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $14.26^{+0.59}_{-0.56}$         | $\sigma_8(0.61)$            | $0.570^{+0.026}_{-0.026}$    |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.35}$          | $z_*$                                 | $1089.73^{+0.89}_{-0.90}$       | $f\sigma_8(2.33)$           | $0.287^{+0.014}_{-0.014}$    |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $145.08^{+0.95}_{-0.95}$        | $\sigma_8(2.33)$            | $0.293^{+0.017}_{-0.017}$    |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04140^{+0.00097}_{-0.00094}$ | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.931^{+0.087}_{-0.087}$      | $f_{2000}^{217}$            | $106.5^{+4.1}_{-4.2}$        |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.72^{+0.97}_{-0.94}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-5}$               |
| $H_0$                                    | $63.6^{+4.7}_{-4.5}$            | $r_{\mathrm{drag}}$                   | $147.76^{+0.94}_{-0.93}$        | $\chi_{\mathrm{lensing}}^2$ | $10.3 (\nu: 2.4)$            |
| $\Omega_{\Lambda}$                       | $0.662^{+0.032}_{-0.034}$       | $k_{\mathrm{D}}$                      | $0.1402^{+0.0010}_{-0.00097}$   | $\chi_{\mathrm{simall}}^2$  | $396.4 (\nu: 0.8)$           |
| $\Omega_{\mathrm{m}}$                    | $0.349^{+0.048}_{-0.044}$       | $100\theta_{\mathrm{D}}$              | $0.16091^{+0.00055}_{-0.00055}$ | $\chi_{\mathrm{lowl}}^2$    | $21.8 (\nu: 0.6)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1406^{+0.0041}_{-0.0040}$    | $z_{\mathrm{eq}}$                     | $3344^{+98}_{-96}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7063.0 (\nu: 15.3)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.0894^{+0.0082}_{-0.0080}$    | $k_{\mathrm{eq}}$                     | $0.01021^{+0.00030}_{-0.00029}$ | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.794^{+0.024}_{-0.024}$       | $100\theta_{\mathrm{eq}}$             | $0.824^{+0.019}_{-0.019}$       | $\chi_{\mathrm{CMB}}^2$     | $7491.5 (\nu: 15.6)$         |
| $S_8$                                    | $0.856^{+0.042}_{-0.043}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4551^{+0.0098}_{-0.0097}$    |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7498.95; \Delta \bar{\chi}_{\mathrm{eff}}^2 = -1.06; R - 1 = 0.01796$$



## 12.19 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022422 | $0.02242^{+0.00033}_{-0.00033}$ | $S_8$                       | 0.8541   | $0.857^{+0.041}_{-0.040}$       | $H(0.15)$                   | 69.39    | $69.0^{+4.1}_{-4.1}$         |
| $\Omega_c h^2$                       | 0.11833  | $0.1182^{+0.0030}_{-0.0029}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4678   | $0.469^{+0.023}_{-0.022}$       | $D_M(0.15)$                 | 675.7    | $680^{+44}_{-43}$            |
| $100\theta_{MC}$                     | 1.04100  | $1.04101^{+0.00064}_{-0.00065}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6101   | $0.610^{+0.013}_{-0.013}$       | $H(0.38)$                   | 79.74    | $79.4^{+3.9}_{-3.8}$         |
| $\tau$                               | 0.0500   | $0.049^{+0.016}_{-0.017}$       | $\sigma_8/h^{0.5}$          | 0.9949   | $0.995^{+0.019}_{-0.021}$       | $D_M(0.38)$                 | 1604     | $1614^{+97}_{-90}$           |
| $\Omega_K$                           | -0.0092  | $-0.011^{+0.012}_{-0.013}$      | $r_{\text{drag}} h$         | 94.3     | $93.8^{+6.2}_{-6.2}$            | $H(0.51)$                   | 86.59    | $86.3^{+3.7}_{-3.7}$         |
| $\ln(10^{10} A_s)$                   | 3.0294   | $3.027^{+0.032}_{-0.036}$       | $\langle d^2 \rangle^{1/2}$ | 2.468    | $2.470^{+0.055}_{-0.056}$       | $D_M(0.51)$                 | 2073     | $2085^{+120}_{-110}$         |
| $n_s$                                | 0.9693   | $0.9694^{+0.0095}_{-0.0097}$    | $z_{\text{re}}$             | 7.16     | $7.0^{+1.7}_{-1.8}$             | $H(0.61)$                   | 92.30    | $92.0^{+3.6}_{-3.6}$         |
| $y_{\text{cal}}$                     | 0.99993  | $1.0001^{+0.0048}_{-0.0047}$    | $10^9 A_s$                  | 2.069    | $2.063^{+0.068}_{-0.072}$       | $D_M(0.61)$                 | 2408     | $2421^{+130}_{-120}$         |
| $A_{100}^{\text{PS}}$                | 233.1    | $238^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8717   | $1.871^{+0.022}_{-0.023}$       | $H(2.33)$                   | 233.57   | $233.3^{+3.7}_{-3.6}$        |
| $A_{143}^{\text{PS}}$                | 46.5     | $37^{+20}_{-20}$                | $D_{40}$                    | 1213.6   | $1212^{+29}_{-28}$              | $D_M(2.33)$                 | 5920     | $5939^{+200}_{-190}$         |
| $A_{217}^{\text{PS}}$                | 104.8    | $102^{+30}_{-30}$               | $D_{220}$                   | 5721     | $5722^{+74}_{-75}$              | $f\sigma_8(0.15)$           | 0.4702   | $0.471^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | 39.1     | $39^{+10}_{-10}$                | $D_{810}$                   | 2531.9   | $2530^{+26}_{-25}$              | $\sigma_8(0.15)$            | 0.7319   | $0.729^{+0.023}_{-0.023}$    |
| $A_{143}^{\text{tSZ}}$               | 4.82     | $< 7.56$                        | $D_{1420}$                  | 815.4    | $814.9^{+9.3}_{-9.3}$           | $f\sigma_8(0.38)$           | 0.4812   | $0.481^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.753    | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | 230.86   | $230.6^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | 0.6451   | $0.642^{+0.024}_{-0.025}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.68     | —                               | $n_{s,0.002}$               | 0.9693   | $0.9694^{+0.0095}_{-0.0097}$    | $f\sigma_8(0.51)$           | 0.4761   | $0.4757^{+0.0082}_{-0.0087}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.94     | —                               | $Y_P$                       | 0.245416 | $0.24541^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.6021   | $0.599^{+0.024}_{-0.025}$    |
| $A^{\text{kSZ}}$                     | 3.0      | —                               | $Y_P^{\text{BBN}}$          | 0.246743 | $0.24674^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | 0.4686   | $0.4680^{+0.0077}_{-0.0078}$ |
| $A_{100}^{\text{dust}}$              | 1.009    | $1.01^{+0.38}_{-0.38}$          | $10^5 D/H$                  | 2.576    | $2.578^{+0.061}_{-0.059}$       | $\sigma_8(0.61)$            | 0.5719   | $0.569^{+0.024}_{-0.025}$    |
| $A_{143}^{\text{dust}}$              | 0.950    | $0.97^{+0.34}_{-0.35}$          | Age/Gyr                     | 14.19    | $14.24^{+0.51}_{-0.48}$         | $f\sigma_8(2.33)$           | 0.2874   | $0.286^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{dust}}$              | 0.981    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1089.71  | $1089.71^{+0.60}_{-0.58}$       | $\sigma_8(2.33)$            | 0.2938   | $0.292^{+0.016}_{-0.017}$    |
| $A_{143 \times 217}^{\text{dust}}$   | 1.033    | $1.02^{+0.31}_{-0.31}$          | $r_*$                       | 144.82   | $144.87^{+0.64}_{-0.64}$        | $f_{2000}^{143}$            | 28.9     | $29^{+6}_{-6}$               |
| $c_{100}$                            | 0.99785  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04119  | $1.04119^{+0.00063}_{-0.00063}$ | $f_{2000}^{217}$            | 105.89   | $106.1^{+4.0}_{-3.8}$        |
| $c_{217}$                            | 1.00113  | $1.0010^{+0.0030}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.910   | $13.914^{+0.059}_{-0.059}$      | $f_{2000}^{143 \times 217}$ | 31.50    | $31^{+4}_{-4}$               |
| $c_{TE}$                             | 0.9957   | $0.9955^{+0.0097}_{-0.0096}$    | $z_{\text{drag}}$           | 1059.93  | $1059.91^{+0.67}_{-0.66}$       | $\chi_{\text{lensing}}^2$   | 9.39     | $10.2 (\nu: 1.8)$            |
| $c_{EE}$                             | 0.9917   | $0.9914^{+0.0094}_{-0.0098}$    | $r_{\text{drag}}$           | 147.48   | $147.52^{+0.63}_{-0.63}$        | $\chi_{\text{small}}^2$     | 395.63   | $396.8 (\nu: 1.1)$           |
| $H_0$                                | 63.95    | $63.6^{+4.3}_{-4.3}$            | $k_D$                       | 0.14050  | $0.14045^{+0.00068}_{-0.00068}$ | $\chi_{\text{lowl}}^2$      | 21.83    | $21.93 (\nu: 0.4)$           |
| $\Omega_\Lambda$                     | 0.6635   | $0.660^{+0.034}_{-0.034}$       | $100\theta_D$               | 0.160754 | $0.16077^{+0.00038}_{-0.00038}$ | $\chi_{\text{CamSpec}}^2$   | 11498.3  | $11513.1 (\nu: 16.0)$        |
| $\Omega_m$                           | 0.3457   | $0.351^{+0.046}_{-0.045}$       | $z_{\text{eq}}$             | 3364     | $3360^{+66}_{-64}$              | $\chi_{\text{prior}}^2$     | 2.0      | $7.7 (\nu: 5.6)$             |
| $\Omega_m h^2$                       | 0.14140  | $0.1413^{+0.0028}_{-0.0027}$    | $k_{\text{eq}}$             | 0.010266 | $0.01026^{+0.00020}_{-0.00019}$ | $\chi_{\text{CMB}}^2$       | 11925.1  | $11942.0 (\nu: 17.3)$        |
| $\Omega_m h^3$                       | 0.0904   | $0.0898^{+0.0070}_{-0.0070}$    | $100\theta_{\text{eq}}$     | 0.8205   | $0.821^{+0.013}_{-0.013}$       |                             |          |                              |
| $\sigma_8$                           | 0.7956   | $0.793^{+0.021}_{-0.021}$       | $100\theta_{s,\text{eq}}$   | 0.4531   | $0.4535^{+0.0064}_{-0.0065}$    |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 11927.06$ ;  $\Delta\chi_{\text{eff}}^2 = -2.59$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.70$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -1.75$ ;  $R - 1 = 0.01965$   
 $\chi_{\text{eff}}^2$ : CMB - smicadx12.Dec5\_ftl\_mv2\_ndclpp\_p.teb.consext8: 9.39 ( $\Delta$  0.56) simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.63 ( $\Delta$  -0.24) commander\_dx12.v3.2.29: 21.83 ( $\Delta$  -1.39) CamSpec like\_10.7HM\_1400\_unified: 11498.26 ( $\Delta$  -1.40)



## 12.20 base\_omegak\_CamSpecHM\_TTTEEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}} h^2$              | $0.02242^{+0.00033}_{-0.00033}$ | $S_8$                               | $0.854^{+0.039}_{-0.039}$       | $H(0.15)$                   | $69.5^{+3.9}_{-3.8}$         |
| $\Omega_{\text{c}} h^2$              | $0.1181^{+0.0030}_{-0.0028}$    | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.468^{+0.021}_{-0.021}$       | $D_{\text{M}}(0.15)$        | $675^{+41}_{-39}$            |
| $100\theta_{\text{MC}}$              | $1.04102^{+0.00064}_{-0.00064}$ | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.610^{+0.013}_{-0.013}$       | $H(0.38)$                   | $79.8^{+3.6}_{-3.5}$         |
| $\tau$                               | $0.0523^{+0.011}_{-0.0091}$     | $\sigma_8/h^{0.5}$                  | $0.996^{+0.019}_{-0.020}$       | $D_{\text{M}}(0.38)$        | $1603^{+88}_{-84}$           |
| $\Omega_K$                           | $-0.009^{+0.011}_{-0.012}$      | $r_{\text{drag}} h$                 | $94.5^{+5.8}_{-5.7}$            | $H(0.51)$                   | $86.7^{+3.5}_{-3.4}$         |
| $\ln(10^{10} A_{\text{s}})$          | $3.033^{+0.025}_{-0.023}$       | $\langle d^2 \rangle^{1/2}$         | $2.470^{+0.054}_{-0.054}$       | $D_{\text{M}}(0.51)$        | $2072^{+110}_{-100}$         |
| $n_{\text{s}}$                       | $0.9696^{+0.0094}_{-0.0098}$    | $z_{\text{re}}$                     | $< 8.47$                        | $H(0.61)$                   | $92.4^{+3.4}_{-3.3}$         |
| $y_{\text{cal}}$                     | $1.0001^{+0.0048}_{-0.0047}$    | $10^9 A_{\text{s}}$                 | $2.077^{+0.052}_{-0.047}$       | $D_{\text{M}}(0.61)$        | $2407^{+120}_{-110}$         |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.870^{+0.023}_{-0.023}$       | $H(2.33)$                   | $233.5^{+3.6}_{-3.6}$        |
| $A_{143}^{\text{PS}}$                | $37^{+20}_{-20}$                | $D_{40}$                            | $1213^{+29}_{-28}$              | $D_{\text{M}}(2.33)$        | $5919^{+180}_{-180}$         |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                           | $5721^{+74}_{-75}$              | $f\sigma_8(0.15)$           | $0.470^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                           | $2530^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.733^{+0.020}_{-0.019}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.58$                        | $D_{1420}$                          | $815.0^{+9.2}_{-9.2}$           | $f\sigma_8(0.38)$           | $0.481^{+0.011}_{-0.012}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                          | $230.7^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.646^{+0.022}_{-0.021}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{\text{s},0.002}$                | $0.9696^{+0.0094}_{-0.0098}$    | $f\sigma_8(0.51)$           | $0.4762^{+0.0081}_{-0.0086}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}$                      | $0.24541^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | $0.603^{+0.022}_{-0.021}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_{\text{P}}^{\text{BBN}}$         | $0.24674^{+0.00013}_{-0.00013}$ | $f\sigma_8(0.61)$           | $0.4688^{+0.0073}_{-0.0071}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $10^5 \text{D}/\text{H}$            | $2.577^{+0.062}_{-0.060}$       | $\sigma_8(0.61)$            | $0.573^{+0.022}_{-0.021}$    |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.35}$          | $\text{Age}/\text{Gyr}$             | $14.19^{+0.47}_{-0.45}$         | $f\sigma_8(2.33)$           | $0.288^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                               | $1089.70^{+0.60}_{-0.59}$       | $\sigma_8(2.33)$            | $0.295^{+0.015}_{-0.014}$    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.31}$          | $r_*$                               | $144.88^{+0.63}_{-0.65}$        | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                       | $1.04120^{+0.00062}_{-0.00063}$ | $f_{2000}^{217}$            | $106.1^{+4.0}_{-3.9}$        |
| $c_{217}$                            | $1.0010^{+0.0031}_{-0.0031}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.914^{+0.059}_{-0.060}$      | $f_{2000}^{143 \times 217}$ | $31^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9955^{+0.0098}_{-0.0095}$    | $z_{\text{drag}}$                   | $1059.91^{+0.67}_{-0.66}$       | $\chi_{\text{lensing}}^2$   | $10.1 (\nu: 1.7)$            |
| $c_{EE}$                             | $0.9915^{+0.0096}_{-0.0099}$    | $r_{\text{drag}}$                   | $147.53^{+0.62}_{-0.64}$        | $\chi_{\text{simall}}^2$    | $396.3 (\nu: 0.6)$           |
| $H_0$                                | $64.1^{+4.1}_{-4.0}$            | $k_{\text{D}}$                      | $0.14044^{+0.00069}_{-0.00068}$ | $\chi_{\text{lowl}}^2$      | $21.99 (\nu: 0.5)$           |
| $\Omega_{\Lambda}$                   | $0.664^{+0.030}_{-0.030}$       | $100\theta_{\text{D}}$              | $0.16077^{+0.00038}_{-0.00038}$ | $\chi_{\text{CamSpec}}^2$   | $11513.1 (\nu: 16.0)$        |
| $\Omega_{\text{m}}$                  | $0.345^{+0.041}_{-0.041}$       | $z_{\text{eq}}$                     | $3359^{+67}_{-63}$              | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.7)$             |
| $\Omega_{\text{m}} h^2$              | $0.1412^{+0.0028}_{-0.0027}$    | $k_{\text{eq}}$                     | $0.01025^{+0.00020}_{-0.00019}$ | $\chi_{\text{CMB}}^2$       | $11941.6 (\nu: 16.8)$        |
| $\Omega_{\text{m}} h^3$              | $0.0905^{+0.0066}_{-0.0064}$    | $100\theta_{\text{eq}}$             | $0.821^{+0.013}_{-0.013}$       |                             |                              |
| $\sigma_8$                           | $0.797^{+0.019}_{-0.018}$       | $100\theta_{\text{s,eq}}$           | $0.4535^{+0.0064}_{-0.0065}$    |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11949.31; \Delta\bar{\chi}_{\text{eff}}^2 = -1.94; R - 1 = 0.03090$$



## 13 r

### 13.1 base\_r\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|--------------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022148 | $0.02214^{+0.00045}_{-0.00043}$ | $\sigma_8/h^{0.5}$          | 0.9893   | $0.989^{+0.032}_{-0.032}$       | $H(0.51)$                      | 89.44    | $89.43^{+0.92}_{-0.87}$      |
| $\Omega_c h^2$                       | 0.12010  | $0.1201^{+0.0042}_{-0.0042}$    | $r_{\text{drag}} h$         | 98.89    | $98.9^{+3.3}_{-3.2}$            | $D_M(0.51)$                    | 1991.4   | $1992^{+37}_{-37}$           |
| $100\theta_{\text{MC}}$              | 1.04090  | $1.04087^{+0.00093}_{-0.00094}$ | $\langle d^2 \rangle^{1/2}$ | 2.443    | $2.440^{+0.077}_{-0.076}$       | $H(0.61)$                      | 95.09    | $95.09^{+0.74}_{-0.69}$      |
| $\tau$                               | 0.0527   | $0.052^{+0.016}_{-0.016}$       | $z_{\text{re}}$             | 7.56     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.61)$                    | 2316.5   | $2317^{+40}_{-40}$           |
| $\ln(10^{10} A_s)$                   | 3.0397   | $3.038^{+0.032}_{-0.032}$       | $10^9 A_s$                  | 2.090    | $2.086^{+0.068}_{-0.066}$       | $H(2.33)$                      | 236.40   | $236.4^{+2.6}_{-2.5}$        |
| $n_s$                                | 0.9648   | $0.965^{+0.012}_{-0.012}$       | $10^9 A_s e^{-2\tau}$       | 1.8810   | $1.880^{+0.027}_{-0.027}$       | $D_M(2.33)$                    | 5773.7   | $5774^{+32}_{-33}$           |
| $r$                                  | 0.000    | $< 0.113$                       | $D_{40}$                    | 1227.6   | $1240^{+38}_{-34}$              | $f\sigma_8(0.15)$              | 0.4606   | $0.460^{+0.025}_{-0.024}$    |
| $y_{\text{cal}}$                     | 1.00069  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                   | 5706     | $5700^{+83}_{-81}$              | $\sigma_8(0.15)$               | 0.7484   | $0.748^{+0.015}_{-0.015}$    |
| $A_{100}^{\text{PS}}$                | 239.9    | $242^{+50}_{-50}$               | $D_{810}$                   | 2535.5   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$              | 0.4776   | $0.477^{+0.019}_{-0.019}$    |
| $A_{143}^{\text{PS}}$                | 44.7     | $41^{+20}_{-20}$                | $D_{1420}$                  | 815.0    | $815^{+10}_{-10}$               | $\sigma_8(0.38)$               | 0.6628   | $0.662^{+0.012}_{-0.012}$    |
| $A_{217}^{\text{PS}}$                | 101.0    | $102^{+30}_{-30}$               | $D_{2000}$                  | 229.80   | $229.7^{+3.6}_{-3.6}$           | $f\sigma_8(0.51)$              | 0.4756   | $0.475^{+0.016}_{-0.017}$    |
| $A_{217}^{\text{CIB}}$               | 43.6     | $41^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9648   | $0.965^{+0.012}_{-0.012}$       | $\sigma_8(0.51)$               | 0.6200   | $0.619^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{tSZ}}$               | 5.20     | $< 7.42$                        | $Y_{\text{P}}$              | 0.245304 | $0.24530^{+0.00018}_{-0.00021}$ | $f\sigma_8(0.61)$              | 0.4702   | $0.470^{+0.014}_{-0.015}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.633    | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | 0.246630 | $0.24662^{+0.00018}_{-0.00021}$ | $\sigma_8(0.61)$               | 0.5898   | $0.589^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.79     | —                               | $10^5 D/H$                  | 2.628    | $2.629^{+0.084}_{-0.083}$       | $f\sigma_8(2.33)$              | 0.29717  | $0.2968^{+0.0050}_{-0.0049}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.41     | —                               | Age/Gyr                     | 13.821   | $13.822^{+0.073}_{-0.074}$      | $\sigma_8(2.33)$               | 0.3061   | $0.3058^{+0.0053}_{-0.0051}$ |
| $A^{\text{kSZ}}$                     | 2.2      | —                               | $z_*$                       | 1090.21  | $1090.22^{+0.82}_{-0.82}$       | $r_{0.002}$                    | 0.000    | $< 0.106$                    |
| $A_{100}^{\text{dust}}$              | 1.011    | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | 144.57   | $144.57^{+0.95}_{-0.96}$        | $r_{0.01}$                     | 0.000    | $< 0.110$                    |
| $A_{143}^{\text{dust}}$              | 0.987    | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$               | 1.04110  | $1.04108^{+0.00092}_{-0.00093}$ | $\ln(10^{10} A_{\text{t}})$    | -7.90    | $-0.7^{+1.9}_{-2.5}$         |
| $A_{217}^{\text{dust}}$              | 0.969    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.887   | $13.887^{+0.088}_{-0.088}$      | $r_{10}$                       | 0.0000   | $< 0.0549$                   |
| $A_{143 \times 217}^{\text{dust}}$   | 0.998    | $1.03^{+0.32}_{-0.32}$          | $z_{\text{drag}}$           | 1059.44  | $1059.41^{+0.90}_{-0.89}$       | $10^9 A_{\text{t}}$            | 0.000    | $< 0.236$                    |
| $c_{100}$                            | 0.99756  | $0.9974^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | 147.31   | $147.31^{+0.95}_{-0.96}$        | $10^9 A_{\text{t}} e^{-2\tau}$ | 0.000    | $< 0.212$                    |
| $c_{217}$                            | 1.00143  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | 0.14046  | $0.1405^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$               | 31.1     | $31^{+6}_{-6}$               |
| $H_0$                                | 67.13    | $67.1^{+1.9}_{-1.8}$            | $100\theta_{\text{D}}$      | 0.16106  | $0.16107^{+0.00053}_{-0.00053}$ | $f_{2000}^{217}$               | 107.56   | $107.5^{+4.0}_{-4.0}$        |
| $\Omega_{\Lambda}$                   | 0.6829   | $0.682^{+0.025}_{-0.027}$       | $z_{\text{eq}}$             | 3399     | $3400^{+96}_{-95}$              | $f_{2000}^{143 \times 217}$    | 32.96    | $33^{+4}_{-4}$               |
| $\Omega_{\text{m}}$                  | 0.3171   | $0.318^{+0.027}_{-0.025}$       | $k_{\text{eq}}$             | 0.010375 | $0.01038^{+0.00029}_{-0.00029}$ | $\chi_{\text{simall}}^2$       | 395.88   | $397.1 (\nu: 1.3)$           |
| $\Omega_{\text{m}} h^2$              | 0.14289  | $0.1429^{+0.0040}_{-0.0040}$    | $100\theta_{\text{eq}}$     | 0.8132   | $0.813^{+0.018}_{-0.018}$       | $\chi_{\text{lowl}}^2$         | 23.22    | $24.7 (\nu: 1.6)$            |
| $\Omega_{\text{m}} h^3$              | 0.09592  | $0.09590^{+0.00090}_{-0.00089}$ | $100\theta_{\text{s,eq}}$   | 0.4495   | $0.4495^{+0.0093}_{-0.0091}$    | $\chi_{\text{CamSpec}}^2$      | 7050.5   | $7063.7 (\nu: 15.1)$         |
| $\sigma_8$                           | 0.8105   | $0.810^{+0.018}_{-0.018}$       | $H(0.15)$                   | 72.46    | $72.5^{+1.6}_{-1.6}$            | $\chi_{\text{prior}}^2$        | 2.2      | $7.6 (\nu: 6.0)$             |
| $S_8$                                | 0.8333   | $0.833^{+0.049}_{-0.047}$       | $D_M(0.15)$                 | 645.4    | $646^{+16}_{-16}$               | $\chi_{\text{CMB}}^2$          | 7469.6   | $7485.5 (\nu: 16.4)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | 0.4564   | $0.456^{+0.027}_{-0.026}$       | $H(0.38)$                   | 82.67    | $82.7^{+1.2}_{-1.1}$            |                                |          |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | 0.6082   | $0.608^{+0.024}_{-0.023}$       | $D_M(0.38)$                 | 1538.0   | $1538^{+32}_{-32}$              |                                |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 7471.85$ ;  $\Delta\chi_{\text{eff}}^2 = 0.12$ ;  $\bar{\chi}_{\text{eff}}^2 = 7493.09$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = 1.55$ ;  $R - 1 = 0.00732$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.88 ( $\Delta$  0.05) commander\_dx12\_v3.2.29: 23.22 ( $\Delta$  -0.18) CamSpec like\_10.7HM: 7050.52 ( $\Delta$  0.19)



### 13.2 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02222^{+0.00039}_{-0.00039}$ | $r_{\text{drag}} h$         | $99.9^{+1.9}_{-1.8}$            | $H(0.61)$                   | $95.30^{+0.50}_{-0.48}$      |
| $\Omega_c h^2$                       | $0.1188^{+0.0024}_{-0.0024}$    | $\langle d^2 \rangle^{1/2}$ | $2.419^{+0.055}_{-0.054}$       | $D_M(0.61)$                 | $2304^{+23}_{-24}$           |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00082}_{-0.00082}$ | $z_{\text{re}}$             | $7.6^{+1.6}_{-1.6}$             | $H(2.33)$                   | $235.6^{+1.6}_{-1.5}$        |
| $\tau$                               | $0.053^{+0.016}_{-0.015}$       | $10^9 A_s$                  | $2.085^{+0.069}_{-0.066}$       | $D_M(2.33)$                 | $5766^{+24}_{-24}$           |
| $\ln(10^{10} A_s)$                   | $3.037^{+0.033}_{-0.032}$       | $10^9 A_s e^{-2\tau}$       | $1.874^{+0.023}_{-0.023}$       | $f\sigma_8(0.15)$           | $0.453^{+0.015}_{-0.015}$    |
| $n_s$                                | $0.9682^{+0.0086}_{-0.0085}$    | $D_{40}$                    | $1235^{+34}_{-33}$              | $\sigma_8(0.15)$            | $0.745^{+0.014}_{-0.013}$    |
| $r$                                  | $< 0.118$                       | $D_{220}$                   | $5704^{+81}_{-80}$              | $f\sigma_8(0.38)$           | $0.472^{+0.013}_{-0.013}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0050}_{-0.0049}$    | $D_{810}$                   | $2533^{+27}_{-27}$              | $\sigma_8(0.38)$            | $0.661^{+0.012}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.51)$           | $0.471^{+0.012}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{2000}$                  | $229.9^{+3.6}_{-3.5}$           | $\sigma_8(0.51)$            | $0.618^{+0.011}_{-0.010}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $n_{s,0.002}$               | $0.9682^{+0.0086}_{-0.0085}$    | $f\sigma_8(0.61)$           | $0.466^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $Y_{\text{P}}$              | $0.24533^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.588^{+0.010}_{-0.0098}$   |
| $A_{143}^{\text{tSZ}}$               | $< 7.42$                        | $Y_{\text{P}}^{\text{BBN}}$ | $0.24666^{+0.00016}_{-0.00017}$ | $f\sigma_8(2.33)$           | $0.2968^{+0.0052}_{-0.0049}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $10^5 \text{D/H}$           | $2.615^{+0.074}_{-0.072}$       | $\sigma_8(2.33)$            | $0.3061^{+0.0053}_{-0.0051}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | Age/Gyr                     | $13.804^{+0.055}_{-0.055}$      | $r_{0.002}$                 | $< 0.112$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $z_*$                       | $1090.01^{+0.58}_{-0.58}$       | $r_{0.01}$                  | $< 0.115$                    |
| $A^{\text{kSZ}}$                     | —                               | $r_*$                       | $144.86^{+0.63}_{-0.63}$        | $\ln(10^{10} A_t)$          | $-0.6^{+1.9}_{-2.5}$         |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $100\theta_*$               | $1.04125^{+0.00081}_{-0.00081}$ | $r_{10}$                    | $< 0.0580$                   |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.35}_{-0.34}$          | $D_M(z_*)/\text{Gpc}$       | $13.912^{+0.061}_{-0.061}$      | $10^9 A_t$                  | $< 0.246$                    |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $z_{\text{drag}}$           | $1059.50^{+0.89}_{-0.86}$       | $10^9 A_t e^{-2\tau}$       | $< 0.221$                    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.31}_{-0.32}$          | $r_{\text{drag}}$           | $147.58^{+0.68}_{-0.68}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\text{D}}$              | $0.14023^{+0.00088}_{-0.00086}$ | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$        |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{\text{D}}$      | $0.16103^{+0.00051}_{-0.00051}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $H_0$                                | $67.7^{+1.1}_{-1.1}$            | $z_{\text{eq}}$             | $3370^{+56}_{-56}$              | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.5)$           |
| $\Omega_{\Lambda}$                   | $0.691^{+0.014}_{-0.015}$       | $k_{\text{eq}}$             | $0.01028^{+0.00017}_{-0.00017}$ | $\chi_{\text{lowl}}^2$      | $24.1 (\nu: 1.3)$            |
| $\Omega_{\text{m}}$                  | $0.309^{+0.015}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.819^{+0.011}_{-0.010}$       | $\chi_{\text{CamSpec}}^2$   | $7064.2 (\nu: 14.8)$         |
| $\Omega_{\text{m}} h^2$              | $0.1417^{+0.0024}_{-0.0023}$    | $100\theta_{s,\text{eq}}$   | $0.4524^{+0.0054}_{-0.0053}$    | $\chi_{6\text{DF}}^2$       | $0.051 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^3$              | $0.09590^{+0.00091}_{-0.00088}$ | $H(0.15)$                   | $72.95^{+0.94}_{-0.92}$         | $\chi_{\text{MGS}}^2$       | $1.44 (\nu: 0.1)$            |
| $\sigma_8$                           | $0.806^{+0.015}_{-0.015}$       | $D_M(0.15)$                 | $640.6^{+9.2}_{-9.1}$           | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 1.1)$             |
| $S_8$                                | $0.818^{+0.030}_{-0.029}$       | $H(0.38)$                   | $83.01^{+0.71}_{-0.69}$         | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.0)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.448^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | $1528^{+19}_{-19}$              | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.7)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.601^{+0.016}_{-0.015}$       | $H(0.51)$                   | $89.70^{+0.58}_{-0.56}$         | $\chi_{\text{CMB}}^2$       | $7485.4 (\nu: 15.8)$         |
| $\sigma_8/h^{0.5}$                   | $0.980^{+0.023}_{-0.022}$       | $D_M(0.51)$                 | $1980^{+22}_{-22}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7499.09; \Delta \bar{\chi}_{\text{eff}}^2 = 1.54; R - 1 = 0.01122$$



### 13.3 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                      | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|--------------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02215^{+0.00044}_{-0.00043}$ | $\sigma_8/h^{0.5}$          | $0.989^{+0.032}_{-0.031}$       | $H(0.51)$                      | $89.45^{+0.92}_{-0.86}$      |
| $\Omega_c h^2$                       | $0.1200^{+0.0042}_{-0.0042}$    | $r_{\text{drag}} h$         | $98.9^{+3.3}_{-3.2}$            | $D_M(0.51)$                    | $1991^{+37}_{-37}$           |
| $100\theta_{\text{MC}}$              | $1.04088^{+0.00093}_{-0.00094}$ | $\langle d^2 \rangle^{1/2}$ | $2.442^{+0.076}_{-0.074}$       | $H(0.61)$                      | $95.11^{+0.73}_{-0.69}$      |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $z_{\text{re}}$             | $< 8.82$                        | $D_M(0.61)$                    | $2316^{+39}_{-40}$           |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.028}_{-0.026}$       | $10^9 A_s$                  | $2.092^{+0.059}_{-0.054}$       | $H(2.33)$                      | $236.4^{+2.6}_{-2.5}$        |
| $n_s$                                | $0.965^{+0.012}_{-0.011}$       | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.028}_{-0.027}$       | $D_M(2.33)$                    | $5773^{+32}_{-33}$           |
| $r$                                  | $< 0.112$                       | $D_{40}$                    | $1240^{+38}_{-34}$              | $f\sigma_8(0.15)$              | $0.461^{+0.024}_{-0.024}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                   | $5700^{+83}_{-81}$              | $\sigma_8(0.15)$               | $0.749^{+0.014}_{-0.014}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                   | $2533^{+27}_{-27}$              | $f\sigma_8(0.38)$              | $0.478^{+0.019}_{-0.019}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $815^{+10}_{-10}$               | $\sigma_8(0.38)$               | $0.663^{+0.011}_{-0.010}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{2000}$                  | $229.7^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$              | $0.476^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $n_{\text{s},0.002}$        | $0.965^{+0.012}_{-0.011}$       | $\sigma_8(0.51)$               | $0.620^{+0.010}_{-0.0091}$   |
| $A_{143}^{\text{tSZ}}$               | $< 7.42$                        | $Y_{\text{P}}$              | $0.24530^{+0.00018}_{-0.00020}$ | $f\sigma_8(0.61)$              | $0.470^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24663^{+0.00018}_{-0.00020}$ | $\sigma_8(0.61)$               | $0.5900^{+0.0090}_{-0.0087}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.628^{+0.083}_{-0.082}$       | $f\sigma_8(2.33)$              | $0.2973^{+0.0044}_{-0.0041}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | Age/Gyr                     | $13.821^{+0.072}_{-0.074}$      | $\sigma_8(2.33)$               | $0.3063^{+0.0045}_{-0.0042}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.21^{+0.80}_{-0.81}$       | $r_{0.002}$                    | $< 0.105$                    |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.38}$          | $r_*$                       | $144.59^{+0.95}_{-0.96}$        | $r_{0.01}$                     | $< 0.109$                    |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$               | $1.04109^{+0.00091}_{-0.00093}$ | $\ln(10^{10} A_{\text{t}})$    | $-0.7^{+1.9}_{-2.5}$         |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.888^{+0.088}_{-0.088}$      | $r_{10}$                       | $< 0.0544$                   |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $z_{\text{drag}}$           | $1059.43^{+0.93}_{-0.91}$       | $10^9 A_{\text{t}}$            | $< 0.234$                    |
| $c_{100}$                            | $0.9974^{+0.0021}_{-0.0020}$    | $r_{\text{drag}}$           | $147.33^{+0.95}_{-0.96}$        | $10^9 A_{\text{t}} e^{-2\tau}$ | $< 0.210$                    |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | $0.1404^{+0.0010}_{-0.0010}$    | $f_{2000}^{143}$               | $31^{+6}_{-6}$               |
| $H_0$                                | $67.2^{+1.9}_{-1.8}$            | $100\theta_{\text{D}}$      | $0.16106^{+0.00052}_{-0.00053}$ | $f_{2000}^{217}$               | $107.4^{+4.0}_{-4.0}$        |
| $\Omega_{\Lambda}$                   | $0.683^{+0.025}_{-0.027}$       | $z_{\text{eq}}$             | $3398^{+96}_{-95}$              | $f_{2000}^{143 \times 217}$    | $33^{+4}_{-4}$               |
| $\Omega_{\text{m}}$                  | $0.317^{+0.027}_{-0.025}$       | $k_{\text{eq}}$             | $0.01037^{+0.00029}_{-0.00029}$ | $\chi_{\text{simall}}^2$       | $397.0 (\nu: 1.3)$           |
| $\Omega_{\text{m}} h^2$              | $0.1428^{+0.0040}_{-0.0040}$    | $100\theta_{\text{eq}}$     | $0.814^{+0.018}_{-0.018}$       | $\chi_{\text{lowl}}^2$         | $24.6 (\nu: 1.6)$            |
| $\Omega_{\text{m}} h^3$              | $0.09590^{+0.00090}_{-0.00088}$ | $100\theta_{\text{s,eq}}$   | $0.4497^{+0.0093}_{-0.0091}$    | $\chi_{\text{CamSpec}}^2$      | $7063.6 (\nu: 15.0)$         |
| $\sigma_8$                           | $0.811^{+0.017}_{-0.017}$       | $H(0.15)$                   | $72.5^{+1.6}_{-1.6}$            | $\chi_{\text{prior}}^2$        | $7.6 (\nu: 5.9)$             |
| $S_8$                                | $0.833^{+0.049}_{-0.048}$       | $D_M(0.15)$                 | $645^{+16}_{-16}$               | $\chi_{\text{CMB}}^2$          | $7485.2 (\nu: 15.8)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.456^{+0.027}_{-0.026}$       | $H(0.38)$                   | $82.7^{+1.2}_{-1.1}$            |                                |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.608^{+0.023}_{-0.023}$       | $D_M(0.38)$                 | $1538^{+32}_{-32}$              |                                |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7492.76; \Delta \bar{\chi}_{\text{eff}}^2 = 1.50; R - 1 = 0.00713$$



### 13.4 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                      | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|--------------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02222^{+0.00039}_{-0.00038}$ | $r_{\text{drag}} h$         | $99.9^{+1.9}_{-1.8}$            | $H(0.61)$                      | $95.30^{+0.50}_{-0.47}$      |
| $\Omega_c h^2$                       | $0.1188^{+0.0024}_{-0.0024}$    | $\langle d^2 \rangle^{1/2}$ | $2.422^{+0.054}_{-0.050}$       | $D_M(0.61)$                    | $2304^{+23}_{-24}$           |
| $100\theta_{\text{MC}}$              | $1.04105^{+0.00082}_{-0.00082}$ | $z_{\text{re}}$             | $< 8.91$                        | $H(2.33)$                      | $235.6^{+1.6}_{-1.5}$        |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $10^9 A_s$                  | $2.090^{+0.060}_{-0.055}$       | $D_M(2.33)$                    | $5765^{+24}_{-24}$           |
| $\ln(10^{10} A_s)$                   | $3.040^{+0.029}_{-0.027}$       | $10^9 A_s e^{-2\tau}$       | $1.873^{+0.023}_{-0.023}$       | $f\sigma_8(0.15)$              | $0.453^{+0.015}_{-0.015}$    |
| $n_s$                                | $0.9683^{+0.0086}_{-0.0085}$    | $D_{40}$                    | $1234^{+34}_{-32}$              | $\sigma_8(0.15)$               | $0.746^{+0.012}_{-0.012}$    |
| $r$                                  | $< 0.118$                       | $D_{220}$                   | $5704^{+81}_{-80}$              | $f\sigma_8(0.38)$              | $0.472^{+0.013}_{-0.012}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $D_{810}$                   | $2533^{+27}_{-27}$              | $\sigma_8(0.38)$               | $0.661^{+0.010}_{-0.0099}$   |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{1420}$                  | $815^{+10}_{-9.9}$              | $f\sigma_8(0.51)$              | $0.471^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{2000}$                  | $230.0^{+3.7}_{-3.5}$           | $\sigma_8(0.51)$               | $0.6192^{+0.0096}_{-0.0091}$ |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $n_{\text{s},0.002}$        | $0.9683^{+0.0086}_{-0.0085}$    | $f\sigma_8(0.61)$              | $0.466^{+0.010}_{-0.0099}$   |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $Y_{\text{P}}$              | $0.24533^{+0.00016}_{-0.00016}$ | $\sigma_8(0.61)$               | $0.5892^{+0.0091}_{-0.0085}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.42$                        | $Y_{\text{P}}^{\text{BBN}}$ | $0.24666^{+0.00016}_{-0.00017}$ | $f\sigma_8(2.33)$              | $0.2972^{+0.0045}_{-0.0042}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $10^5 \text{D/H}$           | $2.614^{+0.074}_{-0.072}$       | $\sigma_8(2.33)$               | $0.3065^{+0.0047}_{-0.0043}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | Age/Gyr                     | $13.803^{+0.055}_{-0.055}$      | $r_{0.002}$                    | $< 0.111$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $z_*$                       | $1090.00^{+0.58}_{-0.59}$       | $r_{0.01}$                     | $< 0.114$                    |
| $A^{\text{kSZ}}$                     | —                               | $r_*$                       | $144.86^{+0.63}_{-0.63}$        | $\ln(10^{10} A_{\text{t}})$    | $-0.6^{+1.9}_{-2.5}$         |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $100\theta_*$               | $1.04125^{+0.00081}_{-0.00081}$ | $r_{10}$                       | $< 0.0575$                   |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.35}_{-0.34}$          | $D_M(z_*)/\text{Gpc}$       | $13.912^{+0.061}_{-0.061}$      | $10^9 A_{\text{t}}$            | $< 0.245$                    |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $z_{\text{drag}}$           | $1059.50^{+0.89}_{-0.87}$       | $10^9 A_{\text{t}} e^{-2\tau}$ | $< 0.220$                    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_{\text{drag}}$           | $147.58^{+0.68}_{-0.68}$        | $f_{2000}^{143}$               | $30^{+6}_{-6}$               |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\text{D}}$              | $0.14023^{+0.00088}_{-0.00086}$ | $f_{2000}^{217}$               | $107.2^{+4.0}_{-3.9}$        |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{\text{D}}$      | $0.16103^{+0.00051}_{-0.00051}$ | $f_{2000}^{143 \times 217}$    | $33^{+4}_{-4}$               |
| $H_0$                                | $67.7^{+1.1}_{-1.1}$            | $z_{\text{eq}}$             | $3369^{+56}_{-56}$              | $\chi_{\text{simall}}^2$       | $397.1 (\nu: 1.5)$           |
| $\Omega_{\Lambda}$                   | $0.691^{+0.014}_{-0.015}$       | $k_{\text{eq}}$             | $0.01028^{+0.00017}_{-0.00017}$ | $\chi_{\text{lowl}}^2$         | $24.1 (\nu: 1.3)$            |
| $\Omega_{\text{m}}$                  | $0.309^{+0.015}_{-0.014}$       | $100\theta_{\text{eq}}$     | $0.819^{+0.011}_{-0.010}$       | $\chi_{\text{CamSpec}}^2$      | $7064.0 (\nu: 14.7)$         |
| $\Omega_{\text{m}} h^2$              | $0.1416^{+0.0023}_{-0.0023}$    | $100\theta_{\text{s,eq}}$   | $0.4524^{+0.0055}_{-0.0053}$    | $\chi_{6\text{DF}}^2$          | $0.050 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^3$              | $0.09590^{+0.00091}_{-0.00088}$ | $H(0.15)$                   | $72.96^{+0.94}_{-0.92}$         | $\chi_{\text{MGS}}^2$          | $1.44 (\nu: 0.1)$            |
| $\sigma_8$                           | $0.807^{+0.015}_{-0.013}$       | $D_M(0.15)$                 | $640.5^{+9.2}_{-9.1}$           | $\chi_{\text{DR12BAO}}^2$      | $4.5 (\nu: 1.1)$             |
| $S_8$                                | $0.819^{+0.029}_{-0.029}$       | $H(0.38)$                   | $83.02^{+0.71}_{-0.68}$         | $\chi_{\text{prior}}^2$        | $7.6 (\nu: 5.9)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.449^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | $1528^{+18}_{-19}$              | $\chi_{\text{BAO}}^2$          | $6.0 (\nu: 0.7)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.602^{+0.016}_{-0.015}$       | $H(0.51)$                   | $89.71^{+0.58}_{-0.56}$         | $\chi_{\text{CMB}}^2$          | $7485.2 (\nu: 15.5)$         |
| $\sigma_8/h^{0.5}$                   | $0.981^{+0.022}_{-0.021}$       | $D_M(0.51)$                 | $1980^{+22}_{-22}$              |                                |                              |

$$\bar{\chi}_{\text{eff}}^2 = 7498.81; \Delta \bar{\chi}_{\text{eff}}^2 = 1.50; R - 1 = 0.01239$$



### 13.5 base\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022286 | $0.02230^{+0.00033}_{-0.00032}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4524   | $0.451^{+0.018}_{-0.018}$       | $H(0.38)$                   | 82.86    | $82.93^{+0.79}_{-0.75}$      |
| $\Omega_c h^2$              | 0.11958  | $0.1193^{+0.0028}_{-0.0028}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6046   | $0.603^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | 1532.8   | $1531^{+21}_{-22}$           |
| $100\theta_{MC}$            | 1.04088  | $1.04090^{+0.00063}_{-0.00064}$ | $\sigma_8/h^{0.5}$          | 0.9839   | $0.982^{+0.024}_{-0.024}$       | $H(0.51)$                   | 89.60    | $89.65^{+0.63}_{-0.60}$      |
| $\tau$                      | 0.0524   | $0.052^{+0.015}_{-0.015}$       | $r_{drag}h$                 | 99.30    | $99.5^{+2.2}_{-2.1}$            | $D_M(0.51)$                 | 1985.3   | $1983^{+24}_{-25}$           |
| $\ln(10^{10} A_s)$          | 3.0375   | $3.037^{+0.031}_{-0.031}$       | $\langle d^2 \rangle^{1/2}$ | 2.431    | $2.426^{+0.057}_{-0.058}$       | $H(0.61)$                   | 95.234   | $95.28^{+0.50}_{-0.48}$      |
| $n_s$                       | 0.9666   | $0.9673^{+0.0093}_{-0.0092}$    | $z_{re}$                    | 7.49     | $7.5^{+1.5}_{-1.6}$             | $D_M(0.61)$                 | 2309.9   | $2308^{+26}_{-27}$           |
| $r$                         | 0.010    | $< 0.147$                       | $10^9 A_s$                  | 2.085    | $2.084^{+0.066}_{-0.064}$       | $H(2.33)$                   | 236.20   | $236.1^{+1.6}_{-1.7}$        |
| $y_{cal}$                   | 1.00042  | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8780   | $1.877^{+0.023}_{-0.023}$       | $D_M(2.33)$                 | 5766.9   | $5765^{+22}_{-23}$           |
| $A_{100}^{PS}$              | 234.2    | $239^{+50}_{-50}$               | $D_{40}$                    | 1227.1   | $1243^{+37}_{-35}$              | $f\sigma_8(0.15)$           | 0.4568   | $0.455^{+0.017}_{-0.017}$    |
| $A_{143}^{PS}$              | 39.9     | $39^{+20}_{-20}$                | $D_{220}$                   | 5712     | $5713^{+78}_{-78}$              | $\sigma_8(0.15)$            | 0.7463   | $0.746^{+0.013}_{-0.013}$    |
| $A_{217}^{PS}$              | 102.1    | $103^{+30}_{-30}$               | $D_{810}$                   | 2534.9   | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | 0.4746   | $0.473^{+0.013}_{-0.014}$    |
| $A_{217}^{CIB}$             | 44.4     | $39^{+10}_{-10}$                | $D_{1420}$                  | 816.0    | $816.1^{+9.4}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6613   | $0.661^{+0.011}_{-0.011}$    |
| $A_{143}^{tSZ}$             | 6.41     | $< 7.53$                        | $D_{2000}$                  | 230.33   | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4730   | $0.472^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{PS}$   | 0.599    | $0.66^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | 0.9666   | $0.9673^{+0.0093}_{-0.0092}$    | $\sigma_8(0.51)$            | 0.6188   | $0.618^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | 0.77     | —                               | $Y_P$                       | 0.245362 | $0.24536^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | 0.4679   | $0.467^{+0.011}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | 0.11     | —                               | $Y_P^{BBN}$                 | 0.246688 | $0.24669^{+0.00012}_{-0.00014}$ | $\sigma_8(0.61)$            | 0.5887   | $0.5884^{+0.0098}_{-0.0095}$ |
| $A^{kSZ}$                   | 0.1      | —                               | $10^5 D/H$                  | 2.601    | $2.599^{+0.061}_{-0.060}$       | $f\sigma_8(2.33)$           | 0.29677  | $0.2967^{+0.0049}_{-0.0047}$ |
| $A_{100}^{dust}$            | 1.014    | $1.00^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.806   | $13.802^{+0.050}_{-0.050}$      | $\sigma_8(2.33)$            | 0.3059   | $0.3058^{+0.0051}_{-0.0049}$ |
| $A_{143}^{dust}$            | 0.973    | $0.96^{+0.34}_{-0.34}$          | $z_*$                       | 1089.99  | $1089.95^{+0.57}_{-0.58}$       | $r_{0.002}$                 | 0.009    | $< 0.141$                    |
| $A_{217}^{dust}$            | 0.971    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.60   | $144.66^{+0.64}_{-0.62}$        | $r_{0.01}$                  | 0.0098   | $< 0.144$                    |
| $A_{143 \times 217}^{dust}$ | 1.008    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04106  | $1.04109^{+0.00063}_{-0.00063}$ | $\ln(10^{10} A_t)$          | -1.54    | $-0.2^{+1.6}_{-2.3}$         |
| $c_{100}$                   | 0.99764  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.890   | $13.895^{+0.060}_{-0.057}$      | $r_{10}$                    | 0.0048   | $< 0.0731$                   |
| $c_{217}$                   | 1.00129  | $1.0011^{+0.0030}_{-0.0030}$    | $z_{drag}$                  | 1059.70  | $1059.72^{+0.67}_{-0.67}$       | $10^9 A_t$                  | 0.022    | $< 0.305$                    |
| $c_{TE}$                    | 0.9966   | $0.9968^{+0.0098}_{-0.0095}$    | $r_{drag}$                  | 147.30   | $147.34^{+0.63}_{-0.62}$        | $10^9 A_t e^{-2\tau}$       | 0.019    | $< 0.274$                    |
| $c_{EE}$                    | 0.9921   | $0.9923^{+0.0096}_{-0.0096}$    | $k_D$                       | 0.14059  | $0.14055^{+0.00069}_{-0.00070}$ | $f_{2000}^{143}$            | 29.9     | $29^{+6}_{-6}$               |
| $H_0$                       | 67.41    | $67.5^{+1.3}_{-1.2}$            | $100\theta_D$               | 0.160879 | $0.16088^{+0.00039}_{-0.00039}$ | $f_{2000}^{217}$            | 106.83   | $106.7^{+3.8}_{-3.8}$        |
| $\Omega_\Lambda$            | 0.6864   | $0.688^{+0.017}_{-0.017}$       | $z_{eq}$                    | 3390     | $3385^{+62}_{-63}$              | $f_{2000}^{143 \times 217}$ | 32.08    | $32^{+4}_{-4}$               |
| $\Omega_m$                  | 0.3136   | $0.312^{+0.017}_{-0.017}$       | $k_{eq}$                    | 0.010347 | $0.01033^{+0.00019}_{-0.00019}$ | $\chi_{small}^2$            | 395.84   | $397.1 (\nu: 1.2)$           |
| $\Omega_m h^2$              | 0.14252  | $0.1423^{+0.0026}_{-0.0026}$    | $100\theta_{eq}$            | 0.8152   | $0.816^{+0.012}_{-0.012}$       | $\chi_{lowl}^2$             | 23.19    | $24.9 (\nu: 1.8)$            |
| $\Omega_m h^3$              | 0.09608  | $0.09607^{+0.00063}_{-0.00062}$ | $100\theta_{s,eq}$          | 0.4504   | $0.4510^{+0.00062}_{-0.00060}$  | $\chi_{CamSpec}^2$          | 11499.5  | $11513.6 (\nu: 16.6)$        |
| $\sigma_8$                  | 0.8079   | $0.807^{+0.015}_{-0.015}$       | $H(0.15)$                   | 72.72    | $72.8^{+1.1}_{-1.0}$            | $\chi_{prior}^2$            | 2.2      | $7.8 (\nu: 5.8)$             |
| $S_8$                       | 0.8260   | $0.823^{+0.032}_{-0.033}$       | $D_M(0.15)$                 | 642.9    | $642^{+10}_{-11}$               | $\chi_{CMB}^2$              | 11918.6  | $11935.7 (\nu: 17.7)$        |

Best-fit  $\chi_{eff}^2 = 11920.72$ ;  $\Delta\chi_{eff}^2 = -0.04$ ;  $\bar{\chi}_{eff}^2 = 11943.49$ ;  $\Delta\bar{\chi}_{eff}^2 = 1.03$ ;  $R - 1 = 0.01020$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.84 ( $\Delta$  -0.06) commander\_dx12\_v3.2.29: 23.20 ( $\Delta$  0.19) CamSpec like\_10.7HM\_1400\_unified: 11499.52 ( $\Delta$  -0.12)



### 13.6 base\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00030}_{-0.00029}$ | $\sigma_8/h^{0.5}$                 | $0.978^{+0.021}_{-0.020}$       | $H(0.61)$                        | $95.37^{+0.39}_{-0.38}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1188^{+0.0020}_{-0.0021}$    | $r_{\mathrm{drag}} h$              | $99.9^{+1.6}_{-1.6}$            | $D_{\mathrm{M}}(0.61)$           | $2302^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04097^{+0.00059}_{-0.00059}$ | $\langle d^2 \rangle^{1/2}$        | $2.418^{+0.050}_{-0.049}$       | $H(2.33)$                        | $235.7^{+1.3}_{-1.3}$        |
| $\tau$                                   | $0.053^{+0.015}_{-0.015}$       | $z_{\mathrm{re}}$                  | $7.5^{+1.5}_{-1.6}$             | $D_{\mathrm{M}}(2.33)$           | $5761^{+19}_{-18}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.037^{+0.032}_{-0.031}$       | $10^9 A_{\mathrm{s}}$              | $2.085^{+0.067}_{-0.064}$       | $f\sigma_8(0.15)$                | $0.452^{+0.013}_{-0.013}$    |
| $n_{\mathrm{s}}$                         | $0.9686^{+0.0082}_{-0.0079}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.875^{+0.022}_{-0.022}$       | $\sigma_8(0.15)$                 | $0.745^{+0.013}_{-0.012}$    |
| $r$                                      | $< 0.150$                       | $D_{40}$                           | $1241^{+37}_{-34}$              | $f\sigma_8(0.38)$                | $0.471^{+0.011}_{-0.011}$    |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                          | $5716^{+78}_{-77}$              | $\sigma_8(0.38)$                 | $0.660^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{810}$                          | $2534^{+27}_{-26}$              | $f\sigma_8(0.51)$                | $0.470^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{1420}$                         | $816.5^{+9.3}_{-9.4}$           | $\sigma_8(0.51)$                 | $0.618^{+0.010}_{-0.0099}$   |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{2000}$                         | $230.5^{+3.2}_{-3.2}$           | $f\sigma_8(0.61)$                | $0.4653^{+0.0096}_{-0.0095}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9686^{+0.0082}_{-0.0079}$    | $\sigma_8(0.61)$                 | $0.5882^{+0.0097}_{-0.0094}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.59$                        | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$                | $0.2967^{+0.0049}_{-0.0047}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.26}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$                 | $0.3060^{+0.0051}_{-0.0049}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.592^{+0.055}_{-0.054}$       | $r_{0.002}$                      | $< 0.145$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.794^{+0.042}_{-0.042}$      | $r_{0.01}$                       | $< 0.147$                    |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1089.86^{+0.47}_{-0.47}$       | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.1^{+1.6}_{-2.2}$         |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                              | $144.77^{+0.50}_{-0.49}$        | $r_{10}$                         | $< 0.0749$                   |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $100\theta_*$                      | $1.04116^{+0.00058}_{-0.00058}$ | $10^9 A_{\mathrm{t}}$            | $< 0.312$                    |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.905^{+0.048}_{-0.047}$      | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.281$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.32}$          | $z_{\mathrm{drag}}$                | $1059.77^{+0.66}_{-0.64}$       | $f_{2000}^{143}$                 | $29^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $r_{\mathrm{drag}}$                | $147.45^{+0.52}_{-0.51}$        | $f_{2000}^{217}$                 | $106.6^{+3.7}_{-3.8}$        |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                   | $0.14046^{+0.00062}_{-0.00063}$ | $f_{2000}^{143 \times 217}$      | $32^{+4}_{-4}$               |
| $c_{TE}$                                 | $0.9968^{+0.0098}_{-0.0096}$    | $100\theta_{\mathrm{D}}$           | $0.16085^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{simall}}^2$       | $397.2 (\nu: 1.3)$           |
| $c_{EE}$                                 | $0.9925^{+0.0098}_{-0.0098}$    | $z_{\mathrm{eq}}$                  | $3372^{+47}_{-47}$              | $\chi_{\mathrm{lowl}}^2$         | $24.7 (\nu: 1.7)$            |
| $H_0$                                    | $67.78^{+0.92}_{-0.91}$         | $k_{\mathrm{eq}}$                  | $0.01029^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{CamSpec}}^2$      | $11513.5 (\nu: 16.1)$        |
| $\Omega_{\Lambda}$                       | $0.691^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$          | $0.8187^{+0.0090}_{-0.0087}$    | $\chi_{6\mathrm{DF}}^2$          | $0.040 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4522^{+0.0046}_{-0.0045}$    | $\chi_{\mathrm{MGS}}^2$          | $1.44 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1418^{+0.0019}_{-0.0020}$    | $H(0.15)$                          | $73.03^{+0.79}_{-0.78}$         | $\chi_{\mathrm{DR12BAO}}^2$      | $4.4 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.09608^{+0.00063}_{-0.00062}$ | $D_{\mathrm{M}}(0.15)$             | $639.9^{+7.8}_{-7.7}$           | $\chi_{\mathrm{prior}}^2$        | $7.8 (\nu: 5.7)$             |
| $\sigma_8$                               | $0.805^{+0.014}_{-0.014}$       | $H(0.38)$                          | $83.09^{+0.60}_{-0.57}$         | $\chi_{\mathrm{BAO}}^2$          | $5.89 (\nu: 0.4)$            |
| $S_8$                                    | $0.817^{+0.026}_{-0.025}$       | $D_{\mathrm{M}}(0.38)$             | $1527^{+16}_{-16}$              | $\chi_{\mathrm{CMB}}^2$          | $11935.4 (\nu: 16.9)$        |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.447^{+0.014}_{-0.014}$       | $H(0.51)$                          | $89.77^{+0.47}_{-0.46}$         |                                  |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.600^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.51)$             | $1978^{+18}_{-18}$              |                                  |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.07; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.79; R - 1 = 0.01061$$



### 13.7 base\_r\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02230^{+0.00033}_{-0.00032}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.018}_{-0.018}$       | $H(0.38)$                       | $82.94^{+0.79}_{-0.75}$      |
| $\Omega_{\mathrm{c}}h^2$               | $0.1193^{+0.0027}_{-0.0028}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.016}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$          | $1531^{+21}_{-21}$           |
| $100\theta_{\mathrm{MC}}$              | $1.04091^{+0.00063}_{-0.00064}$ | $\sigma_8/h^{0.5}$                   | $0.983^{+0.023}_{-0.023}$       | $H(0.51)$                       | $89.66^{+0.63}_{-0.60}$      |
| $\tau$                                 | $0.054^{+0.012}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $99.5^{+2.2}_{-2.1}$            | $D_{\mathrm{M}}(0.51)$          | $1983^{+24}_{-25}$           |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.040^{+0.027}_{-0.025}$       | $\langle d^2 \rangle^{1/2}$          | $2.429^{+0.055}_{-0.056}$       | $H(0.61)$                       | $95.28^{+0.50}_{-0.48}$      |
| $n_{\mathrm{s}}$                       | $0.9675^{+0.0094}_{-0.0092}$    | $z_{\mathrm{re}}$                    | $< 8.78$                        | $D_{\mathrm{M}}(0.61)$          | $2307^{+26}_{-27}$           |
| $r$                                    | $< 0.147$                       | $10^9 A_{\mathrm{s}}$                | $2.091^{+0.057}_{-0.052}$       | $H(2.33)$                       | $236.0^{+1.6}_{-1.7}$        |
| $y_{\mathrm{cal}}$                     | $1.0005^{+0.0049}_{-0.0050}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.877^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(2.33)$          | $5765^{+22}_{-23}$           |
| $A_{100}^{\mathrm{PS}}$                | $238^{+50}_{-50}$               | $D_{40}$                             | $1243^{+37}_{-35}$              | $f\sigma_8(0.15)$               | $0.456^{+0.016}_{-0.017}$    |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                            | $5713^{+78}_{-79}$              | $\sigma_8(0.15)$                | $0.747^{+0.013}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                            | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$               | $0.474^{+0.013}_{-0.014}$    |
| $A_{217}^{\mathrm{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                           | $816.1^{+9.5}_{-9.6}$           | $\sigma_8(0.38)$                | $0.662^{+0.010}_{-0.0091}$   |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.53$                        | $D_{2000}$                           | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$               | $0.473^{+0.012}_{-0.012}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$               | $0.9675^{+0.0094}_{-0.0092}$    | $\sigma_8(0.51)$                | $0.6194^{+0.0091}_{-0.0085}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$               | $0.468^{+0.011}_{-0.011}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$                | $0.5894^{+0.0086}_{-0.0079}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.598^{+0.060}_{-0.059}$       | $f\sigma_8(2.33)$               | $0.2971^{+0.0042}_{-0.0039}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.801^{+0.050}_{-0.050}$      | $\sigma_8(2.33)$                | $0.3063^{+0.0043}_{-0.0040}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $z_*$                                | $1089.94^{+0.57}_{-0.58}$       | $r_{0.002}$                     | $< 0.142$                    |
| $A_{217}^{\mathrm{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_*$                                | $144.66^{+0.63}_{-0.62}$        | $r_{0.01}$                      | $< 0.145$                    |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04110^{+0.00062}_{-0.00063}$ | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.2^{+1.6}_{-2.3}$         |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.895^{+0.059}_{-0.057}$      | $r_{10}$                        | $< 0.0732$                   |
| $c_{217}$                              | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.73^{+0.66}_{-0.64}$       | $10^9 A_{\mathrm{t}}$           | $< 0.307$                    |
| $c_{TE}$                               | $0.9966^{+0.0098}_{-0.0094}$    | $r_{\mathrm{drag}}$                  | $147.35^{+0.63}_{-0.62}$        | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.276$                    |
| $c_{EE}$                               | $0.9922^{+0.0097}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.14054^{+0.00069}_{-0.00069}$ | $f_{2000}^{143}$                | $29^{+6}_{-6}$               |
| $H_0$                                  | $67.5^{+1.3}_{-1.2}$            | $100\theta_{\mathrm{D}}$             | $0.16087^{+0.00039}_{-0.00039}$ | $f_{2000}^{217}$                | $106.7^{+3.8}_{-3.8}$        |
| $\Omega_{\Lambda}$                     | $0.688^{+0.017}_{-0.017}$       | $z_{\mathrm{eq}}$                    | $3384^{+62}_{-63}$              | $f_{2000}^{143\times 217}$      | $32^{+4}_{-4}$               |
| $\Omega_{\mathrm{m}}$                  | $0.312^{+0.017}_{-0.017}$       | $k_{\mathrm{eq}}$                    | $0.01033^{+0.00019}_{-0.00019}$ | $\chi_{\mathrm{simall}}^2$      | $397.0 (\nu: 1.2)$           |
| $\Omega_{\mathrm{m}}h^2$               | $0.1422^{+0.0026}_{-0.0026}$    | $100\theta_{\mathrm{eq}}$            | $0.816^{+0.012}_{-0.012}$       | $\chi_{\mathrm{lowl}}^2$        | $24.9 (\nu: 1.8)$            |
| $\Omega_{\mathrm{m}}h^3$               | $0.09607^{+0.00063}_{-0.00062}$ | $100\theta_{\mathrm{s,eq}}$          | $0.4511^{+0.0062}_{-0.0059}$    | $\chi_{\mathrm{CamSpec}}^2$     | $11513.5 (\nu: 16.6)$        |
| $\sigma_8$                             | $0.808^{+0.014}_{-0.014}$       | $H(0.15)$                            | $72.8^{+1.1}_{-1.0}$            | $\chi_{\mathrm{prior}}^2$       | $7.8 (\nu: 5.8)$             |
| $S_8$                                  | $0.824^{+0.032}_{-0.033}$       | $D_{\mathrm{M}}(0.15)$               | $642^{+10}_{-11}$               | $\chi_{\mathrm{CMB}}^2$         | $11935.4 (\nu: 17.4)$        |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11943.24; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.05; R - 1 = 0.00947$$



### 13.8 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00030}_{-0.00029}$ | $\sigma_8/h^{0.5}$                 | $0.980^{+0.020}_{-0.019}$       | $H(0.61)$                        | $95.37^{+0.40}_{-0.38}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1187^{+0.0020}_{-0.0021}$    | $r_{\mathrm{drag}} h$              | $99.96^{+1.6}_{-1.6}$           | $D_{\mathrm{M}}(0.61)$           | $2302^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04098^{+0.00059}_{-0.00059}$ | $\langle d^2 \rangle^{1/2}$        | $2.420^{+0.048}_{-0.046}$       | $H(2.33)$                        | $235.7^{+1.3}_{-1.3}$        |
| $\tau$                                   | $0.055^{+0.013}_{-0.011}$       | $z_{\mathrm{re}}$                  | $< 8.82$                        | $D_{\mathrm{M}}(2.33)$           | $5761^{+19}_{-18}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.040^{+0.027}_{-0.025}$       | $10^9 A_{\mathrm{s}}$              | $2.091^{+0.057}_{-0.053}$       | $f\sigma_8(0.15)$                | $0.453^{+0.013}_{-0.013}$    |
| $n_{\mathrm{s}}$                         | $0.9688^{+0.0083}_{-0.0079}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.874^{+0.022}_{-0.022}$       | $\sigma_8(0.15)$                 | $0.746^{+0.012}_{-0.011}$    |
| $r$                                      | $< 0.150$                       | $D_{40}$                           | $1241^{+37}_{-34}$              | $f\sigma_8(0.38)$                | $0.472^{+0.011}_{-0.011}$    |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0050}$    | $D_{220}$                          | $5715^{+77}_{-78}$              | $\sigma_8(0.38)$                 | $0.6612^{+0.0098}_{-0.0092}$ |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{810}$                          | $2534^{+27}_{-27}$              | $f\sigma_8(0.51)$                | $0.471^{+0.010}_{-0.0097}$   |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{1420}$                         | $816.5^{+9.4}_{-9.4}$           | $\sigma_8(0.51)$                 | $0.6190^{+0.0090}_{-0.0085}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{2000}$                         | $230.6^{+3.2}_{-3.2}$           | $f\sigma_8(0.61)$                | $0.4659^{+0.0093}_{-0.0089}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9688^{+0.0083}_{-0.0079}$    | $\sigma_8(0.61)$                 | $0.5890^{+0.0085}_{-0.0080}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.59$                        | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$                | $0.2971^{+0.0042}_{-0.0039}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.26}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$                 | $0.3065^{+0.0043}_{-0.0041}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.592^{+0.055}_{-0.054}$       | $r_{0.002}$                      | $< 0.146$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.794^{+0.042}_{-0.042}$      | $r_{0.01}$                       | $< 0.148$                    |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1089.85^{+0.47}_{-0.47}$       | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.1^{+1.6}_{-2.2}$         |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                              | $144.78^{+0.50}_{-0.49}$        | $r_{10}$                         | $< 0.0753$                   |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $100\theta_*$                      | $1.04116^{+0.00058}_{-0.00058}$ | $10^9 A_{\mathrm{t}}$            | $< 0.314$                    |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.905^{+0.047}_{-0.047}$      | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.281$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.31}_{-0.32}$          | $z_{\mathrm{drag}}$                | $1059.78^{+0.65}_{-0.64}$       | $f_{2000}^{143}$                 | $29^{+6}_{-6}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $r_{\mathrm{drag}}$                | $147.46^{+0.52}_{-0.51}$        | $f_{2000}^{217}$                 | $106.6^{+3.7}_{-3.8}$        |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                   | $0.14046^{+0.00062}_{-0.00063}$ | $f_{2000}^{143 \times 217}$      | $32^{+4}_{-4}$               |
| $c_{\mathrm{TE}}$                        | $0.9966^{+0.0099}_{-0.0096}$    | $100\theta_{\mathrm{D}}$           | $0.16085^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{simall}}^2$       | $397.1 (\nu: 1.3)$           |
| $c_{\mathrm{EE}}$                        | $0.9925^{+0.0099}_{-0.0099}$    | $z_{\mathrm{eq}}$                  | $3372^{+46}_{-47}$              | $\chi_{\mathrm{lowl}}^2$         | $24.7 (\nu: 1.7)$            |
| $H_0$                                    | $67.79^{+0.92}_{-0.90}$         | $k_{\mathrm{eq}}$                  | $0.01029^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{CamSpec}}^2$      | $11513.4 (\nu: 16.1)$        |
| $\Omega_{\Lambda}$                       | $0.692^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$          | $0.8188^{+0.0090}_{-0.0087}$    | $\chi_{6\mathrm{DF}}^2$          | $0.039 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.308^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4523^{+0.0046}_{-0.0045}$    | $\chi_{\mathrm{MGS}}^2$          | $1.45 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1417^{+0.0019}_{-0.0020}$    | $H(0.15)$                          | $73.04^{+0.79}_{-0.78}$         | $\chi_{\mathrm{DR12BAO}}^2$      | $4.4 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.09608^{+0.00063}_{-0.00062}$ | $D_{\mathrm{M}}(0.15)$             | $639.8^{+7.8}_{-7.7}$           | $\chi_{\mathrm{prior}}^2$        | $7.8 (\nu: 5.7)$             |
| $\sigma_8$                               | $0.807^{+0.013}_{-0.012}$       | $H(0.38)$                          | $83.09^{+0.59}_{-0.57}$         | $\chi_{\mathrm{BAO}}^2$          | $5.88 (\nu: 0.4)$            |
| $S_8$                                    | $0.818^{+0.025}_{-0.025}$       | $D_{\mathrm{M}}(0.38)$             | $1527^{+16}_{-16}$              | $\chi_{\mathrm{CMB}}^2$          | $11935.2 (\nu: 16.7)$        |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.448^{+0.014}_{-0.014}$       | $H(0.51)$                          | $89.78^{+0.48}_{-0.46}$         |                                  |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.601^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.51)$             | $1978^{+18}_{-18}$              |                                  |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.86; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.87; R - 1 = 0.01058$$



### 13.9 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022281 | $0.02230^{+0.00031}_{-0.00030}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6059   | $0.605^{+0.012}_{-0.013}$       | $H(0.51)$                   | 89.57    | $89.62^{+0.54}_{-0.52}$      |
| $\Omega_c h^2$              | 0.11978  | $0.1195^{+0.0023}_{-0.0024}$    | $\sigma_8/h^{0.5}$          | 0.9858   | $0.985^{+0.018}_{-0.018}$       | $D_M(0.51)$                 | 1986.9   | $1985^{+21}_{-21}$           |
| $100\theta_{MC}$            | 1.04085  | $1.04088^{+0.00060}_{-0.00060}$ | $r_{drag}h$                 | 99.15    | $99.4^{+1.9}_{-1.8}$            | $H(0.61)$                   | 95.210   | $95.25^{+0.44}_{-0.42}$      |
| $\tau$                      | 0.0528   | $0.054^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$ | 2.4373   | $2.433^{+0.043}_{-0.043}$       | $D_M(0.61)$                 | 2311.6   | $2309^{+23}_{-23}$           |
| $\ln(10^{10} A_s)$          | 3.0394   | $3.041^{+0.028}_{-0.028}$       | $z_{re}$                    | 7.54     | $7.6^{+1.4}_{-1.5}$             | $H(2.33)$                   | 236.32   | $236.2^{+1.4}_{-1.4}$        |
| $n_s$                       | 0.9654   | $0.9669^{+0.0086}_{-0.0084}$    | $10^9 A_s$                  | 2.089    | $2.092^{+0.060}_{-0.059}$       | $D_M(2.33)$                 | 5767.8   | $5766^{+20}_{-20}$           |
| $r$                         | 0.002    | $< 0.142$                       | $10^9 A_s e^{-2\tau}$       | 1.8800   | $1.878^{+0.021}_{-0.021}$       | $f\sigma_8(0.15)$           | 0.4581   | $0.457^{+0.013}_{-0.013}$    |
| $y_{cal}$                   | 1.00051  | $1.0006^{+0.0049}_{-0.0049}$    | $D_{40}$                    | 1228.2   | $1244^{+36}_{-34}$              | $\sigma_8(0.15)$            | 0.7472   | $0.747^{+0.011}_{-0.011}$    |
| $A_{100}^{PS}$              | 234.2    | $238^{+50}_{-50}$               | $D_{220}$                   | 5720     | $5715^{+75}_{-77}$              | $f\sigma_8(0.38)$           | 0.4757   | $0.475^{+0.010}_{-0.010}$    |
| $A_{143}^{PS}$              | 39.8     | $39^{+20}_{-20}$                | $D_{810}$                   | 2535.9   | $2535^{+26}_{-25}$              | $\sigma_8(0.38)$            | 0.6620   | $0.6622^{+0.0092}_{-0.0092}$ |
| $A_{217}^{PS}$              | 101.8    | $103^{+30}_{-30}$               | $D_{1420}$                  | 815.8    | $816.3^{+9.5}_{-9.3}$           | $f\sigma_8(0.51)$           | 0.4739   | $0.4734^{+0.0089}_{-0.0092}$ |
| $A_{217}^{CIB}$             | 44.7     | $39^{+10}_{-10}$                | $D_{2000}$                  | 230.25   | $230.5^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$            | 0.6193   | $0.6197^{+0.0087}_{-0.0087}$ |
| $A_{143}^{tSZ}$             | 6.62     | $< 7.50$                        | $n_{s,0.002}$               | 0.9654   | $0.9669^{+0.0086}_{-0.0084}$    | $f\sigma_8(0.61)$           | 0.4687   | $0.4683^{+0.0081}_{-0.0083}$ |
| $r_{143 \times 217}^{PS}$   | 0.597    | $0.66^{+0.25}_{-0.26}$          | $Y_P$                       | 0.245359 | $0.24537^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | 0.5892   | $0.5896^{+0.0083}_{-0.0083}$ |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $Y_P^{BBN}$                 | 0.246686 | $0.24669^{+0.00012}_{-0.00013}$ | $f\sigma_8(2.33)$           | 0.29697  | $0.2972^{+0.0043}_{-0.0043}$ |
| $\xi^{tSZ \times CIB}$      | 0.09     | —                               | $10^5 D/H$                  | 2.602    | $2.599^{+0.057}_{-0.056}$       | $\sigma_8(2.33)$            | 0.30602  | $0.3063^{+0.0047}_{-0.0046}$ |
| $A^{kSZ}$                   | 0.0      | —                               | Age/Gyr                     | 13.8075  | $13.804^{+0.045}_{-0.046}$      | $r_{0.002}$                 | 0.002    | $< 0.136$                    |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1090.02  | $1089.97^{+0.51}_{-0.51}$       | $r_{0.01}$                  | 0.002    | $< 0.139$                    |
| $A_{143}^{dust}$            | 0.973    | $0.96^{+0.34}_{-0.35}$          | $r_*$                       | 144.56   | $144.61^{+0.55}_{-0.53}$        | $\ln(10^{10} A_t)$          | -3.19    | $-0.2^{+1.7}_{-2.3}$         |
| $A_{217}^{dust}$            | 0.969    | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04105  | $1.04107^{+0.00059}_{-0.00060}$ | $r_{10}$                    | 0.0009   | $< 0.0700$                   |
| $A_{143 \times 217}^{dust}$ | 1.007    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.886   | $13.891^{+0.052}_{-0.050}$      | $10^9 A_t$                  | 0.004    | $< 0.297$                    |
| $c_{100}$                   | 0.99766  | $0.9975^{+0.0020}_{-0.0021}$    | $z_{drag}$                  | 1059.70  | $1059.74^{+0.65}_{-0.64}$       | $10^9 A_t e^{-2\tau}$       | 0.004    | $< 0.266$                    |
| $c_{217}$                   | 1.00131  | $1.0011^{+0.0031}_{-0.0030}$    | $r_{drag}$                  | 147.25   | $147.30^{+0.56}_{-0.54}$        | $f_{2000}^{143}$            | 30.2     | $29^{+6}_{-5}$               |
| $c_{TE}$                    | 0.9965   | $0.9965^{+0.0097}_{-0.0094}$    | $k_D$                       | 0.14063  | $0.14059^{+0.00063}_{-0.00064}$ | $f_{2000}^{217}$            | 106.93   | $106.7^{+3.7}_{-3.8}$        |
| $c_{EE}$                    | 0.9923   | $0.9921^{+0.0098}_{-0.0097}$    | $100\theta_D$               | 0.160879 | $0.16087^{+0.00037}_{-0.00038}$ | $f_{2000}^{143 \times 217}$ | 32.28    | $32^{+4}_{-4}$               |
| $H_0$                       | 67.34    | $67.5^{+1.1}_{-1.1}$            | $z_{eq}$                    | 3395     | $3389^{+52}_{-54}$              | $\chi^2_{lensing}$          | 8.86     | $9.38 (\nu: 0.3)$            |
| $\Omega_\Lambda$            | 0.6853   | $0.687^{+0.014}_{-0.015}$       | $k_{eq}$                    | 0.010361 | $0.01034^{+0.00016}_{-0.00017}$ | $\chi^2_{small}$            | 395.87   | $397.2 (\nu: 1.3)$           |
| $\Omega_m$                  | 0.3147   | $0.313^{+0.015}_{-0.014}$       | $100\theta_{eq}$            | 0.8143   | $0.815^{+0.010}_{-0.0098}$      | $\chi^2_{lowl}$             | 23.23    | $25.0 (\nu: 1.7)$            |
| $\Omega_m h^2$              | 0.14271  | $0.1425^{+0.0022}_{-0.0023}$    | $100\theta_{s,eq}$          | 0.4500   | $0.4506^{+0.0053}_{-0.0050}$    | $\chi^2_{CamSpec}$          | 11499.4  | $11512.9 (\nu: 15.1)$        |
| $\Omega_m h^3$              | 0.09609  | $0.09609^{+0.00061}_{-0.00061}$ | $H(0.15)$                   | 72.65    | $72.75^{+0.92}_{-0.90}$         | $\chi^2_{prior}$            | 2.2      | $7.8 (\nu: 5.8)$             |
| $\sigma_8$                  | 0.8089   | $0.809^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | 643.6    | $642.6^{+9.1}_{-9.1}$           | $\chi^2_{CMB}$              | 11927.4  | $11944.5 (\nu: 17.2)$        |
| $S_8$                       | 0.8286   | $0.826^{+0.025}_{-0.025}$       | $H(0.38)$                   | 82.82    | $82.89^{+0.67}_{-0.65}$         |                             |          |                              |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4538   | $0.453^{+0.014}_{-0.014}$       | $D_M(0.38)$                 | 1534.2   | $1532^{+18}_{-18}$              |                             |          |                              |

Best-fit  $\chi^2_{eff} = 11929.59$ ;  $\Delta\chi^2_{eff} = -0.06$ ;  $\bar{\chi}^2_{eff} = 11952.27$ ;  $\Delta\bar{\chi}^2_{eff} = 0.82$ ;  $R - 1 = 0.00977$   
 $\chi^2_{eff}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp.p\_teb\_consext8: 8.86 ( $\Delta$  0.03) small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.87 ( $\Delta$  0.00) commander\_dx12\_v3.2\_29: 23.23 ( $\Delta$  0.02) CamSpec like\_10.7HM\_1400.unified: 11499.43 ( $\Delta$  -0.22)



### 13.10 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_lensing\_post\_BAO

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02234^{+0.00029}_{-0.00028}$ | $\sigma_8/h^{0.5}$                 | $0.982^{+0.016}_{-0.016}$       | $H(0.61)$                       | $95.34^{+0.36}_{-0.36}$      |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1190^{+0.0018}_{-0.0019}$    | $r_{\mathrm{drag}}h$               | $99.8^{+1.4}_{-1.4}$            | $D_{\mathrm{M}}(0.61)$          | $2304^{+18}_{-18}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04094^{+0.00058}_{-0.00058}$ | $\langle d^2 \rangle^{1/2}$        | $2.427^{+0.040}_{-0.040}$       | $H(2.33)$                       | $235.9^{+1.1}_{-1.2}$        |
| $\tau$                                   | $0.055^{+0.014}_{-0.014}$       | $z_{\mathrm{re}}$                  | $7.7^{+1.4}_{-1.4}$             | $D_{\mathrm{M}}(2.33)$          | $5762^{+18}_{-18}$           |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.042^{+0.029}_{-0.028}$       | $10^9 A_{\mathrm{s}}$              | $2.096^{+0.061}_{-0.059}$       | $f\sigma_8(0.15)$               | $0.455^{+0.011}_{-0.011}$    |
| $n_{\mathrm{s}}$                         | $0.9682^{+0.0077}_{-0.0076}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$    | $1.877^{+0.021}_{-0.020}$       | $\sigma_8(0.15)$                | $0.747^{+0.010}_{-0.011}$    |
| $r$                                      | $< 0.146$                       | $D_{40}$                           | $1243^{+37}_{-34}$              | $f\sigma_8(0.38)$               | $0.4732^{+0.0090}_{-0.0091}$ |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0048}_{-0.0048}$    | $D_{220}$                          | $5719^{+74}_{-77}$              | $\sigma_8(0.38)$                | $0.6623^{+0.0094}_{-0.0093}$ |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{810}$                          | $2536^{+26}_{-25}$              | $f\sigma_8(0.51)$               | $0.4720^{+0.0082}_{-0.0083}$ |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{1420}$                         | $816.9^{+9.3}_{-9.2}$           | $\sigma_8(0.51)$                | $0.6199^{+0.0088}_{-0.0087}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{2000}$                         | $230.7^{+3.1}_{-3.1}$           | $f\sigma_8(0.61)$               | $0.4672^{+0.0076}_{-0.0077}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9682^{+0.0077}_{-0.0076}$    | $\sigma_8(0.61)$                | $0.5899^{+0.0084}_{-0.0083}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $Y_{\mathrm{P}}$                   | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$               | $0.2975^{+0.0043}_{-0.0043}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.67^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$                | $0.3068^{+0.0046}_{-0.0045}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.592^{+0.054}_{-0.052}$       | $r_{0.002}$                     | $< 0.141$                    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.796^{+0.040}_{-0.040}$      | $r_{0.01}$                      | $< 0.144$                    |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1089.88^{+0.44}_{-0.44}$       | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.2^{+1.7}_{-2.3}$         |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                              | $144.72^{+0.47}_{-0.45}$        | $r_{10}$                        | $< 0.0726$                   |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.35}$          | $100\theta_*$                      | $1.04113^{+0.00057}_{-0.00057}$ | $10^9 A_{\mathrm{t}}$           | $< 0.307$                    |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.21}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.900^{+0.045}_{-0.043}$      | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.274$                    |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $z_{\mathrm{drag}}$                | $1059.78^{+0.65}_{-0.61}$       | $f_{2000}^{143}$                | $29^{+6}_{-5}$               |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0020}$    | $r_{\mathrm{drag}}$                | $147.40^{+0.49}_{-0.48}$        | $f_{2000}^{217}$                | $106.6^{+3.7}_{-3.8}$        |
| $c_{217}$                                | $1.0011^{+0.0032}_{-0.0030}$    | $k_{\mathrm{D}}$                   | $0.14052^{+0.00061}_{-0.00060}$ | $f_{2000}^{143 \times 217}$     | $32^{+4}_{-4}$               |
| $c_{TE}$                                 | $0.9966^{+0.0096}_{-0.0096}$    | $100\theta_{\mathrm{D}}$           | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{\mathrm{lensing}}^2$     | $9.40 (\nu: 0.3)$            |
| $c_{EE}$                                 | $0.9923^{+0.0097}_{-0.0096}$    | $z_{\mathrm{eq}}$                  | $3377^{+42}_{-44}$              | $\chi_{\mathrm{simall}}^2$      | $397.3 (\nu: 1.5)$           |
| $H_0$                                    | $67.69^{+0.83}_{-0.82}$         | $k_{\mathrm{eq}}$                  | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{lowl}}^2$        | $24.8 (\nu: 1.7)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{eq}}$          | $0.8178^{+0.0082}_{-0.0078}$    | $\chi_{\mathrm{CamSpec}}^2$     | $11512.9 (\nu: 15.0)$        |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{s,eq}}$        | $0.4517^{+0.0042}_{-0.0040}$    | $\chi_{6\mathrm{DF}}^2$         | $0.043 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1420^{+0.0017}_{-0.0018}$    | $H(0.15)$                          | $72.95^{+0.71}_{-0.71}$         | $\chi_{\mathrm{MGS}}^2$         | $1.34 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}h^3$                 | $0.09610^{+0.00062}_{-0.00060}$ | $D_{\mathrm{M}}(0.15)$             | $640.6^{+7.0}_{-7.0}$           | $\chi_{\mathrm{DR12BAO}}^2$     | $4.6 (\nu: 0.7)$             |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.012}$       | $H(0.38)$                          | $83.04^{+0.53}_{-0.53}$         | $\chi_{\mathrm{prior}}^2$       | $7.7 (\nu: 5.9)$             |
| $S_8$                                    | $0.821^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$             | $1528^{+14}_{-14}$              | $\chi_{\mathrm{CMB}}^2$         | $11944.4 (\nu: 16.8)$        |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.450^{+0.011}_{-0.011}$       | $H(0.51)$                          | $89.74^{+0.43}_{-0.43}$         | $\chi_{\mathrm{BAO}}^2$         | $5.95 (\nu: 0.4)$            |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$     | $0.603^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.51)$             | $1980^{+17}_{-17}$              |                                 |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.11; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.70; R - 1 = 0.01271$$



### 13.11 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_lensing\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                        | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02230^{+0.00031}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.012}_{-0.013}$       | $H(0.51)$                        | $89.64^{+0.53}_{-0.51}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1195^{+0.0023}_{-0.0024}$    | $\sigma_8/h^{0.5}$                    | $0.985^{+0.017}_{-0.018}$       | $D_{\mathrm{M}}(0.51)$           | $1984^{+21}_{-21}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04088^{+0.00059}_{-0.00060}$ | $r_{\mathrm{drag}} h$                 | $99.4^{+1.8}_{-1.8}$            | $H(0.61)$                        | $95.26^{+0.44}_{-0.42}$      |
| $\tau$                                   | $0.055^{+0.012}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | $2.434^{+0.042}_{-0.043}$       | $D_{\mathrm{M}}(0.61)$           | $2309^{+22}_{-23}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.025}_{-0.024}$       | $z_{\mathrm{re}}$                     | $< 8.83$                        | $H(2.33)$                        | $236.1^{+1.4}_{-1.4}$        |
| $n_{\mathrm{s}}$                         | $0.9671^{+0.0085}_{-0.0083}$    | $10^9 A_{\mathrm{s}}$                 | $2.096^{+0.053}_{-0.050}$       | $D_{\mathrm{M}}(2.33)$           | $5766^{+20}_{-20}$           |
| $r$                                      | $< 0.142$                       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.021}_{-0.021}$       | $f\sigma_8(0.15)$                | $0.457^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0049}$    | $D_{40}$                              | $1244^{+36}_{-34}$              | $\sigma_8(0.15)$                 | $0.748^{+0.010}_{-0.0092}$   |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+50}_{-50}$               | $D_{220}$                             | $5715^{+75}_{-77}$              | $f\sigma_8(0.38)$                | $0.475^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{810}$                             | $2535^{+26}_{-25}$              | $\sigma_8(0.38)$                 | $0.6628^{+0.0088}_{-0.0078}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{1420}$                            | $816.3^{+9.4}_{-9.3}$           | $f\sigma_8(0.51)$                | $0.4737^{+0.0088}_{-0.0090}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{2000}$                            | $230.5^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$                 | $0.6202^{+0.0080}_{-0.0075}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $n_{\mathrm{s},0.002}$                | $0.9671^{+0.0085}_{-0.0083}$    | $f\sigma_8(0.61)$                | $0.4686^{+0.0080}_{-0.0081}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}$                      | $0.24537^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$                 | $0.5901^{+0.0076}_{-0.0071}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24669^{+0.00012}_{-0.00013}$ | $f\sigma_8(2.33)$                | $0.2975^{+0.0039}_{-0.0037}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.599^{+0.057}_{-0.056}$       | $\sigma_8(2.33)$                 | $0.3066^{+0.0042}_{-0.0039}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.803^{+0.045}_{-0.046}$      | $r_{0.002}$                      | $< 0.136$                    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_{*}$                               | $1089.96^{+0.51}_{-0.51}$       | $r_{0.01}$                       | $< 0.139$                    |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.35}$          | $r_{*}$                               | $144.62^{+0.55}_{-0.52}$        | $\ln(10^{10} A_{\mathrm{t}})$    | $-0.2^{+1.7}_{-2.3}$         |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $100\theta_{*}$                       | $1.04107^{+0.00058}_{-0.00059}$ | $r_{10}$                         | $< 0.0699$                   |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $D_{\mathrm{M}}(z_{*})/\mathrm{Gpc}$  | $13.892^{+0.052}_{-0.050}$      | $10^9 A_{\mathrm{t}}$            | $< 0.297$                    |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.74^{+0.65}_{-0.65}$       | $10^9 A_{\mathrm{t}} e^{-2\tau}$ | $< 0.266$                    |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.31^{+0.56}_{-0.53}$        | $f_{2000}^{143}$                 | $29^{+6}_{-5}$               |
| $c_{TE}$                                 | $0.9965^{+0.0097}_{-0.0094}$    | $k_{\mathrm{D}}$                      | $0.14058^{+0.00063}_{-0.00064}$ | $f_{2000}^{217}$                 | $106.7^{+3.7}_{-3.8}$        |
| $c_{EE}$                                 | $0.9921^{+0.0098}_{-0.0098}$    | $100\theta_{\mathrm{D}}$              | $0.16086^{+0.00038}_{-0.00037}$ | $f_{2000}^{143 \times 217}$      | $32^{+4}_{-4}$               |
| $H_0$                                    | $67.5^{+1.1}_{-1.0}$            | $z_{\mathrm{eq}}$                     | $3388^{+52}_{-54}$              | $\chi_{\mathrm{lensing}}^2$      | $9.32 (\nu: 0.3)$            |
| $\Omega_{\Lambda}$                       | $0.687^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01034^{+0.00016}_{-0.00016}$ | $\chi_{\mathrm{simall}}^2$       | $397.1 (\nu: 1.3)$           |
| $\Omega_{\mathrm{m}}$                    | $0.313^{+0.014}_{-0.014}$       | $100\theta_{\mathrm{eq}}$             | $0.816^{+0.010}_{-0.0097}$      | $\chi_{\mathrm{lowl}}^2$         | $25.0 (\nu: 1.7)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1424^{+0.0022}_{-0.0022}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4507^{+0.0052}_{-0.0050}$    | $\chi_{\mathrm{CamSpec}}^2$      | $11512.8 (\nu: 15.0)$        |
| $\Omega_{\mathrm{m}} h^3$                | $0.09609^{+0.00062}_{-0.00062}$ | $H(0.15)$                             | $72.77^{+0.91}_{-0.88}$         | $\chi_{\mathrm{prior}}^2$        | $7.7 (\nu: 5.7)$             |
| $\sigma_8$                               | $0.809^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.15)$                | $642.4^{+8.9}_{-9.0}$           | $\chi_{\mathrm{CMB}}^2$          | $11944.3 (\nu: 16.8)$        |
| $S_8$                                    | $0.827^{+0.025}_{-0.025}$       | $H(0.38)$                             | $82.91^{+0.67}_{-0.64}$         |                                  |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.453^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$                | $1532^{+18}_{-18}$              |                                  |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11952.03; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.78; R - 1 = 0.00998$$



### 13.12 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_lensing\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                      | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|--------------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02234^{+0.00029}_{-0.00028}$ | $\sigma_8/h^{0.5}$          | $0.983^{+0.016}_{-0.016}$       | $H(0.61)$                      | $95.34^{+0.36}_{-0.36}$      |
| $\Omega_c h^2$                       | $0.1190^{+0.0018}_{-0.0019}$    | $r_{\text{drag}} h$         | $99.8^{+1.4}_{-1.4}$            | $D_M(0.61)$                    | $2304^{+18}_{-18}$           |
| $100\theta_{\text{MC}}$              | $1.04095^{+0.00058}_{-0.00058}$ | $\langle d^2 \rangle^{1/2}$ | $2.428^{+0.039}_{-0.038}$       | $H(2.33)$                      | $235.8^{+1.1}_{-1.2}$        |
| $\tau$                               | $0.056^{+0.012}_{-0.012}$       | $z_{\text{re}}$             | $7.8^{+1.1}_{-1.3}$             | $D_M(2.33)$                    | $5762^{+18}_{-18}$           |
| $\ln(10^{10} A_s)$                   | $3.044^{+0.026}_{-0.025}$       | $10^9 A_s$                  | $2.099^{+0.054}_{-0.051}$       | $f\sigma_8(0.15)$              | $0.455^{+0.011}_{-0.011}$    |
| $n_s$                                | $0.9683^{+0.0077}_{-0.0076}$    | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.020}_{-0.020}$       | $\sigma_8(0.15)$               | $0.747^{+0.010}_{-0.0092}$   |
| $r$                                  | $< 0.146$                       | $D_{40}$                    | $1243^{+37}_{-34}$              | $f\sigma_8(0.38)$              | $0.4734^{+0.0089}_{-0.0089}$ |
| $y_{\text{cal}}$                     | $1.0007^{+0.0048}_{-0.0048}$    | $D_{220}$                   | $5719^{+74}_{-77}$              | $\sigma_8(0.38)$               | $0.6627^{+0.0087}_{-0.0083}$ |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $D_{810}$                   | $2536^{+26}_{-25}$              | $f\sigma_8(0.51)$              | $0.4722^{+0.0081}_{-0.0079}$ |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{1420}$                  | $816.8^{+9.3}_{-9.2}$           | $\sigma_8(0.51)$               | $0.6203^{+0.0082}_{-0.0078}$ |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{2000}$                  | $230.7^{+3.1}_{-3.1}$           | $f\sigma_8(0.61)$              | $0.4674^{+0.0075}_{-0.0073}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $n_{\text{s},0.002}$        | $0.9683^{+0.0077}_{-0.0076}$    | $\sigma_8(0.61)$               | $0.5903^{+0.0078}_{-0.0074}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $Y_{\text{P}}$              | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$              | $0.2977^{+0.0040}_{-0.0038}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.67^{+0.25}_{-0.26}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(2.33)$               | $0.3070^{+0.0042}_{-0.0040}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.592^{+0.054}_{-0.052}$       | $r_{0.002}$                    | $< 0.141$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$     | $13.795^{+0.040}_{-0.040}$      | $r_{0.01}$                     | $< 0.143$                    |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1089.87^{+0.44}_{-0.43}$       | $\ln(10^{10} A_{\text{t}})$    | $-0.2^{+1.7}_{-2.3}$         |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | $144.73^{+0.47}_{-0.45}$        | $r_{10}$                       | $< 0.0725$                   |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $100\theta_*$               | $1.04114^{+0.00056}_{-0.00058}$ | $10^9 A_{\text{t}}$            | $< 0.307$                    |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.901^{+0.045}_{-0.043}$      | $10^9 A_{\text{t}} e^{-2\tau}$ | $< 0.274$                    |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $z_{\text{drag}}$           | $1059.79^{+0.64}_{-0.62}$       | $f_{2000}^{143}$               | $29^{+6}_{-5}$               |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0020}$    | $r_{\text{drag}}$           | $147.40^{+0.49}_{-0.48}$        | $f_{2000}^{217}$               | $106.5^{+3.7}_{-3.8}$        |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $k_{\text{D}}$              | $0.14051^{+0.00061}_{-0.00060}$ | $f_{2000}^{143 \times 217}$    | $32^{+4}_{-4}$               |
| $c_{TE}$                             | $0.9966^{+0.0096}_{-0.0095}$    | $100\theta_{\text{D}}$      | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{\text{lensing}}^2$      | $9.34 (\nu: 0.3)$            |
| $c_{EE}$                             | $0.9923^{+0.0097}_{-0.0096}$    | $z_{\text{eq}}$             | $3377^{+42}_{-44}$              | $\chi_{\text{simall}}^2$       | $397.3 (\nu: 1.5)$           |
| $H_0$                                | $67.70^{+0.83}_{-0.82}$         | $k_{\text{eq}}$             | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\text{lowl}}^2$         | $24.8 (\nu: 1.7)$            |
| $\Omega_{\Lambda}$                   | $0.690^{+0.011}_{-0.011}$       | $100\theta_{\text{eq}}$     | $0.8179^{+0.0081}_{-0.0077}$    | $\chi_{\text{CamSpec}}^2$      | $11512.8 (\nu: 14.9)$        |
| $\Omega_{\text{m}}$                  | $0.310^{+0.011}_{-0.011}$       | $100\theta_{\text{s,eq}}$   | $0.4518^{+0.0042}_{-0.0040}$    | $\chi_{6\text{DF}}^2$          | $0.042 (\nu: 0.0)$           |
| $\Omega_{\text{m}} h^2$              | $0.1419^{+0.0017}_{-0.0018}$    | $H(0.15)$                   | $72.97^{+0.71}_{-0.71}$         | $\chi_{\text{MGS}}^2$          | $1.35 (\nu: 0.1)$            |
| $\Omega_{\text{m}} h^3$              | $0.09610^{+0.00062}_{-0.00061}$ | $D_M(0.15)$                 | $640.5^{+7.0}_{-6.9}$           | $\chi_{\text{DR12BAO}}^2$      | $4.5 (\nu: 0.7)$             |
| $\sigma_8$                           | $0.809^{+0.011}_{-0.010}$       | $H(0.38)$                   | $83.04^{+0.53}_{-0.53}$         | $\chi_{\text{prior}}^2$        | $7.7 (\nu: 5.9)$             |
| $S_8$                                | $0.822^{+0.021}_{-0.021}$       | $D_M(0.38)$                 | $1528^{+14}_{-14}$              | $\chi_{\text{CMB}}^2$          | $11944.3 (\nu: 16.5)$        |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.450^{+0.011}_{-0.011}$       | $H(0.51)$                   | $89.74^{+0.43}_{-0.43}$         | $\chi_{\text{BAO}}^2$          | $5.92 (\nu: 0.4)$            |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.603^{+0.011}_{-0.011}$       | $D_M(0.51)$                 | $1980^{+17}_{-16}$              |                                |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11957.91; \Delta\bar{\chi}_{\text{eff}}^2 = 0.65; R - 1 = 0.01331$$



### 13.13 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022078 | $0.02209^{+0.00043}_{-0.00043}$ | $\Omega_m h^3$              | 0.09590  | $0.09591^{+0.00090}_{-0.00088}$ | $D_M(0.15)$                 | 649.4    | $649^{+16}_{-16}$            |
| $\Omega_c h^2$              | 0.12113  | $0.1210^{+0.0041}_{-0.0041}$    | $\sigma_8$                  | 0.8143   | $0.814^{+0.017}_{-0.017}$       | $H(0.38)$                   | 82.39    | $82.4^{+1.1}_{-1.1}$         |
| $100\theta_{MC}$            | 1.04075  | $1.04078^{+0.00092}_{-0.00095}$ | $S_8$                       | 0.8458   | $0.844^{+0.048}_{-0.046}$       | $D_M(0.38)$                 | 1545.8   | $1545^{+31}_{-31}$           |
| $\tau$                      | 0.0528   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4632   | $0.463^{+0.026}_{-0.025}$       | $H(0.51)$                   | 89.22    | $89.26^{+0.89}_{-0.84}$      |
| $\ln(10^{10} A_s)$          | 3.0420   | $3.042^{+0.032}_{-0.032}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6142   | $0.613^{+0.023}_{-0.023}$       | $D_M(0.51)$                 | 2000.6   | $1999^{+36}_{-36}$           |
| $n_s$                       | 0.9626   | $0.963^{+0.011}_{-0.011}$       | $\sigma_8/h^{0.5}$          | 0.9973   | $0.996^{+0.031}_{-0.031}$       | $H(0.61)$                   | 94.93    | $94.96^{+0.71}_{-0.66}$      |
| $r$                         | 0.0132   | $< 0.0591$                      | $r_{drag} h$                | 98.08    | $98.2^{+3.2}_{-3.1}$            | $D_M(0.61)$                 | 2326.4   | $2325^{+39}_{-39}$           |
| $y_{cal}$                   | 1.00060  | $1.0007^{+0.0049}_{-0.0049}$    | $\langle d^2 \rangle^{1/2}$ | 2.461    | $2.459^{+0.074}_{-0.073}$       | $H(2.33)$                   | 237.00   | $236.9^{+2.5}_{-2.5}$        |
| $A_{B,dust}$                | 4.60     | $4.9^{+2.1}_{-1.9}$             | $z_{re}$                    | 7.60     | $7.6^{+1.6}_{-1.7}$             | $D_M(2.33)$                 | 5780.7   | $5779^{+31}_{-32}$           |
| $A_{B,sync}$                | 1.48     | $< 3.68$                        | $10^9 A_s$                  | 2.095    | $2.094^{+0.068}_{-0.066}$       | $f\sigma_8(0.15)$           | 0.4668   | $0.466^{+0.024}_{-0.023}$    |
| $\alpha_{B,dust}$           | -0.52    | —                               | $10^9 A_s e^{-2\tau}$       | 1.8849   | $1.885^{+0.027}_{-0.026}$       | $\sigma_8(0.15)$            | 0.7512   | $0.751^{+0.015}_{-0.015}$    |
| $\beta_{B,dust}$            | 1.573    | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                    | 1237.0   | $1241^{+31}_{-30}$              | $f\sigma_8(0.38)$           | 0.4825   | $0.482^{+0.019}_{-0.019}$    |
| $\alpha_{B,sync}$           | -0.31    | —                               | $D_{220}$                   | 5700     | $5702^{+81}_{-80}$              | $\sigma_8(0.38)$            | 0.6646   | $0.664^{+0.012}_{-0.012}$    |
| $\beta_{B,sync}$            | -3.03    | $-3.10^{+0.52}_{-0.55}$         | $D_{810}$                   | 2535.5   | $2536^{+27}_{-27}$              | $f\sigma_8(0.51)$           | 0.4797   | $0.479^{+0.016}_{-0.016}$    |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.35^{+0.53}_{-0.57}$         | $D_{1420}$                  | 814.2    | $814^{+10}_{-10}$               | $\sigma_8(0.51)$            | 0.6214   | $0.621^{+0.011}_{-0.011}$    |
| $A_{100}^{PS}$              | 237.4    | $242^{+50}_{-50}$               | $D_{2000}$                  | 229.52   | $229.6^{+3.6}_{-3.6}$           | $f\sigma_8(0.61)$           | 0.4737   | $0.473^{+0.014}_{-0.014}$    |
| $A_{143}^{PS}$              | 40.8     | $41^{+20}_{-20}$                | $n_{s,0.002}$               | 0.9626   | $0.963^{+0.011}_{-0.011}$       | $\sigma_8(0.61)$            | 0.5910   | $0.591^{+0.010}_{-0.010}$    |
| $A_{217}^{PS}$              | 100.4    | $102^{+30}_{-30}$               | $Y_P$                       | 0.245274 | $0.24527^{+0.00018}_{-0.00021}$ | $f\sigma_8(2.33)$           | 0.2975   | $0.2974^{+0.0050}_{-0.0049}$ |
| $A_{217}^{CIB}$             | 46.1     | $41^{+10}_{-10}$                | $Y_P^{BBN}$                 | 0.246601 | $0.24660^{+0.00018}_{-0.00021}$ | $\sigma_8(2.33)$            | 0.3062   | $0.3061^{+0.0053}_{-0.0052}$ |
| $A_{143}^{tSZ}$             | 6.47     | $< 7.37$                        | $10^5 D/H$                  | 2.641    | $2.639^{+0.083}_{-0.082}$       | $r_{0.002}$                 | 0.0117   | $< 0.0539$                   |
| $r_{143 \times 217}^{PS}$   | 0.565    | $0.65^{+0.25}_{-0.25}$          | Age/Gyr                     | 13.836   | $13.834^{+0.071}_{-0.072}$      | $r_{0.01}$                  | 0.0124   | $< 0.0565$                   |
| $r_{143 \times 217}^{CIB}$  | 0.81     | —                               | $z_*$                       | 1090.39  | $1090.37^{+0.81}_{-0.79}$       | $\ln(10^{10} A_t)$          | -1.29    | $-0.97^{+1.5}_{-2.1}$        |
| $\xi^{tSZ \times CIB}$      | 0.02     | —                               | $r_*$                       | 144.36   | $144.38^{+0.93}_{-0.94}$        | $r_{10}$                    | 0.0060   | $< 0.0277$                   |
| $A^{kSZ}$                   | 0.2      | —                               | $100\theta_*$               | 1.04097  | $1.04099^{+0.00090}_{-0.00093}$ | $10^9 A_t$                  | 0.028    | $< 0.124$                    |
| $A_{100}^{dust}$            | 1.011    | $1.01^{+0.38}_{-0.38}$          | $D_M(z_*)/\text{Gpc}$       | 13.868   | $13.870^{+0.086}_{-0.087}$      | $10^9 A_t e^{-2\tau}$       | 0.025    | $< 0.111$                    |
| $A_{143}^{dust}$            | 0.985    | $0.97^{+0.35}_{-0.34}$          | $z_{drag}$                  | 1059.32  | $1059.36^{+0.92}_{-0.87}$       | $f_{2000}^{143}$            | 31.3     | $31^{+6}_{-6}$               |
| $A_{217}^{dust}$            | 0.963    | $0.97^{+0.20}_{-0.20}$          | $r_{drag}$                  | 147.12   | $147.14^{+0.93}_{-0.94}$        | $f_{2000}^{217}$            | 107.68   | $107.7^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{dust}$ | 0.996    | $1.03^{+0.32}_{-0.32}$          | $k_D$                       | 0.14061  | $0.1406^{+0.0010}_{-0.0010}$    | $f_{2000}^{143 \times 217}$ | 33.07    | $33^{+4}_{-4}$               |
| $c_{100}$                   | 0.99756  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_D$               | 0.16111  | $0.16110^{+0.00052}_{-0.00052}$ | $\chi_{BKPLANCK}^2$         | 734.95   | $739.3 (\nu: 3.7)$           |
| $c_{217}$                   | 1.00141  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{eq}$                    | 3422     | $3420^{+94}_{-92}$              | $\chi_{small}^2$            | 396.01   | $397.1 (\nu: 1.5)$           |
| $H_0$                       | 66.67    | $66.7^{+1.8}_{-1.8}$            | $k_{eq}$                    | 0.010445 | $0.01044^{+0.00029}_{-0.00028}$ | $\chi_{lowl}^2$             | 24.16    | $24.7 (\nu: 1.1)$            |
| $\Omega_\Lambda$            | 0.6763   | $0.677^{+0.025}_{-0.026}$       | $100\theta_{eq}$            | 0.8088   | $0.809^{+0.017}_{-0.017}$       | $\chi_{CamSpec}^2$          | 7049.9   | $7063.0 (\nu: 14.1)$         |
| $\Omega_m$                  | 0.3237   | $0.323^{+0.026}_{-0.025}$       | $100\theta_{s,eq}$          | 0.4473   | $0.4475^{+0.0090}_{-0.0088}$    | $\chi_{prior}^2$            | 2.3      | $9.2 (\nu: 7.3)$             |
| $\Omega_m h^2$              | 0.14385  | $0.1438^{+0.0039}_{-0.0039}$    | $H(0.15)$                   | 72.07    | $72.1^{+1.5}_{-1.5}$            | $\chi_{CMB}^2$              | 8205.0   | $8224.0 (\nu: 18.8)$         |

Best-fit  $\chi_{eff}^2 = 8207.30$ ;  $\bar{\chi}_{eff}^2 = 8233.28$ ;  $R - 1 = 0.00244$

$\chi_{eff}^2$ : CMB - BK15\_dust: 734.95 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.00 commander\_dx12\_v3\_2\_29: 24.16 CamSpec like\_10.7HM: 7049.91



### 13.14 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022205 | $0.02220^{+0.00039}_{-0.00038}$ | $S_8$                       | 0.8233   | $0.823^{+0.029}_{-0.029}$       | $D_M(0.51)$                 | 1983.0   | $1983^{+22}_{-22}$           |
| $\Omega_c h^2$              | 0.11915  | $0.1191^{+0.0024}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4510   | $0.451^{+0.016}_{-0.016}$       | $H(0.61)$                   | 95.246   | $95.25^{+0.48}_{-0.47}$      |
| $100\theta_{MC}$            | 1.04103  | $1.04104^{+0.00081}_{-0.00083}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6038   | $0.604^{+0.016}_{-0.015}$       | $D_M(0.61)$                 | 2307.5   | $2307^{+23}_{-23}$           |
| $\tau$                      | 0.0547   | $0.055^{+0.016}_{-0.015}$       | $\sigma_8/h^{0.5}$          | 0.9836   | $0.984^{+0.023}_{-0.022}$       | $H(2.33)$                   | 235.85   | $235.8^{+1.5}_{-1.5}$        |
| $\ln(10^{10} A_s)$          | 3.0410   | $3.041^{+0.032}_{-0.032}$       | $r_{drag} h$                | 99.64    | $99.7^{+1.8}_{-1.8}$            | $D_M(2.33)$                 | 5767.4   | $5767^{+24}_{-24}$           |
| $n_s$                       | 0.9668   | $0.9672^{+0.0085}_{-0.0084}$    | $\langle d^2 \rangle^{1/2}$ | 2.431    | $2.430^{+0.054}_{-0.052}$       | $f\sigma_8(0.15)$           | 0.4556   | $0.455^{+0.015}_{-0.015}$    |
| $r$                         | 0.0188   | $< 0.0625$                      | $z_{re}$                    | 7.74     | $7.7^{+1.5}_{-1.6}$             | $\sigma_8(0.15)$            | 0.7470   | $0.747^{+0.013}_{-0.013}$    |
| $y_{cal}$                   | 1.00052  | $1.0008^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | 2.093    | $2.094^{+0.068}_{-0.066}$       | $f\sigma_8(0.38)$           | 0.4739   | $0.474^{+0.013}_{-0.012}$    |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | 1.8758   | $1.877^{+0.023}_{-0.023}$       | $\sigma_8(0.38)$            | 0.6622   | $0.662^{+0.011}_{-0.011}$    |
| $A_{B,sync}$                | 1.44     | $< 3.69$                        | $D_{40}$                    | 1229.8   | $1233^{+28}_{-27}$              | $f\sigma_8(0.51)$           | 0.4726   | $0.473^{+0.011}_{-0.011}$    |
| $\alpha_{B,dust}$           | -0.50    | —                               | $D_{220}$                   | 5709     | $5710^{+80}_{-79}$              | $\sigma_8(0.51)$            | 0.6197   | $0.620^{+0.010}_{-0.010}$    |
| $\beta_{B,dust}$            | 1.578    | $1.59^{+0.19}_{-0.19}$          | $D_{810}$                   | 2533.2   | $2535^{+27}_{-27}$              | $f\sigma_8(0.61)$           | 0.4676   | $0.468^{+0.011}_{-0.010}$    |
| $\alpha_{B,sync}$           | -0.29    | —                               | $D_{1420}$                  | 814.9    | $816^{+10}_{-9.9}$              | $\sigma_8(0.61)$            | 0.5897   | $0.5899^{+0.0099}_{-0.0098}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | 229.82   | $230.0^{+3.5}_{-3.5}$           | $f\sigma_8(2.33)$           | 0.29734  | $0.2974^{+0.0050}_{-0.0049}$ |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.35^{+0.53}_{-0.57}$         | $n_{s,0.002}$               | 0.9668   | $0.9672^{+0.0085}_{-0.0084}$    | $\sigma_8(2.33)$            | 0.3066   | $0.3067^{+0.0051}_{-0.0051}$ |
| $A_{100}^{PS}$              | 240.3    | $242^{+50}_{-50}$               | $Y_P$                       | 0.245328 | $0.24532^{+0.00015}_{-0.00017}$ | $r_{0.002}$                 | 0.0171   | $< 0.0577$                   |
| $A_{143}^{PS}$              | 39.2     | $40^{+20}_{-20}$                | $Y_P^{BBN}$                 | 0.246654 | $0.24665^{+0.00015}_{-0.00017}$ | $r_{0.01}$                  | 0.0179   | $< 0.0601$                   |
| $A_{217}^{PS}$              | 99.8     | $102^{+30}_{-30}$               | $10^5 D/H$                  | 2.617    | $2.618^{+0.073}_{-0.072}$       | $\ln(10^{10} A_t)$          | -0.93    | $-0.9^{+1.5}_{-2.0}$         |
| $A_{217}^{CIB}$             | 44.8     | $40^{+10}_{-10}$                | Age/Gyr                     | 13.807   | $13.807^{+0.054}_{-0.054}$      | $r_{10}$                    | 0.0087   | $< 0.0296$                   |
| $A_{143}^{tSZ}$             | 5.62     | $< 7.40$                        | $z_*$                       | 1090.06  | $1090.05^{+0.57}_{-0.57}$       | $10^9 A_t$                  | 0.039    | $< 0.131$                    |
| $r_{143 \times 217}^{PS}$   | 0.569    | $0.65^{+0.25}_{-0.25}$          | $r_*$                       | 144.78   | $144.79^{+0.61}_{-0.62}$        | $10^9 A_t e^{-2\tau}$       | 0.035    | $< 0.117$                    |
| $r_{143 \times 217}^{CIB}$  | 0.74     | —                               | $100\theta_*$               | 1.04123  | $1.04124^{+0.00080}_{-0.00082}$ | $f_{2000}^{143}$            | 31.0     | $30^{+6}_{-6}$               |
| $\xi^{tSZ \times CIB}$      | 0.04     | —                               | $D_M(z_*)/\text{Gpc}$       | 13.904   | $13.906^{+0.060}_{-0.060}$      | $f_{2000}^{217}$            | 107.48   | $107.4^{+4.0}_{-4.0}$        |
| $A^{kSZ}$                   | 1.6      | —                               | $z_{drag}$                  | 1059.47  | $1059.48^{+0.87}_{-0.85}$       | $f_{2000}^{143 \times 217}$ | 32.87    | $33^{+4}_{-4}$               |
| $A_{100}^{dust}$            | 1.005    | $1.01^{+0.38}_{-0.38}$          | $r_{drag}$                  | 147.50   | $147.52^{+0.66}_{-0.67}$        | $\chi_{BKPLANCK}^2$         | 735.63   | $740.0 (\nu: 3.6)$           |
| $A_{143}^{dust}$            | 0.992    | $0.97^{+0.35}_{-0.35}$          | $k_D$                       | 0.14031  | $0.14029^{+0.00087}_{-0.00085}$ | $\chi_{small}^2$            | 396.19   | $397.3 (\nu: 1.8)$           |
| $A_{217}^{dust}$            | 0.966    | $0.97^{+0.20}_{-0.20}$          | $100\theta_D$               | 0.16103  | $0.16104^{+0.00050}_{-0.00050}$ | $\chi_{lowl}^2$             | 23.47    | $23.7 (\nu: 0.6)$            |
| $A_{143 \times 217}^{dust}$ | 1.011    | $1.03^{+0.32}_{-0.32}$          | $z_{eq}$                    | 3378     | $3377^{+56}_{-55}$              | $\chi_{CamSpec}^2$          | 7050.8   | $7063.3 (\nu: 13.8)$         |
| $c_{100}$                   | 0.99750  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{eq}$                    | 0.010310 | $0.01031^{+0.00017}_{-0.00017}$ | $\chi_{6DF}^2$              | 0.030    | $0.064 (\nu: 0.0)$           |
| $c_{217}$                   | 1.00140  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{eq}$            | 0.8173   | $0.818^{+0.010}_{-0.010}$       | $\chi_{MGS}^2$              | 1.22     | $1.30 (\nu: 0.1)$            |
| $H_0$                       | 67.55    | $67.6^{+1.1}_{-1.1}$            | $100\theta_{s,eq}$          | 0.4516   | $0.4517^{+0.0053}_{-0.0053}$    | $\chi_{DR12BAO}^2$          | 4.37     | $4.9 (\nu: 1.5)$             |
| $\Omega_\Lambda$            | 0.6888   | $0.689^{+0.014}_{-0.014}$       | $H(0.15)$                   | 72.82    | $72.84^{+0.92}_{-0.91}$         | $\chi_{prior}^2$            | 2.3      | $9.2 (\nu: 7.3)$             |
| $\Omega_m$                  | 0.3112   | $0.311^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | 641.8    | $641.7^{+9.1}_{-9.1}$           | $\chi_{BAO}^2$              | 5.62     | $6.3 (\nu: 1.0)$             |
| $\Omega_m h^2$              | 0.14200  | $0.1420^{+0.0023}_{-0.0023}$    | $H(0.38)$                   | 82.92    | $82.94^{+0.69}_{-0.68}$         | $\chi_{CMB}^2$              | 8206.1   | $8224.3 (\nu: 18.1)$         |
| $\Omega_m h^3$              | 0.09592  | $0.09592^{+0.00089}_{-0.00088}$ | $D_M(0.38)$                 | 1530.7   | $1530^{+18}_{-18}$              |                             |          |                              |
| $\sigma_8$                  | 0.8084   | $0.809^{+0.015}_{-0.015}$       | $H(0.51)$                   | 89.63    | $89.64^{+0.57}_{-0.56}$         |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8214.03$ ;  $\bar{\chi}_{eff}^2 = 8239.80$ ;  $R - 1 = 0.00717$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.03 MGS: 1.22 DR12BAO: 4.37 CMB - BK15\_dust: 735.63 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.19 commander\_dx12\_v3\_2\_29: 23.46 CamSpec like\_10.7HM: 7050.82



### 13.15 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022111 | $0.02212^{+0.00041}_{-0.00041}$ | $\sigma_8$                  | 0.8124   | $0.812^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1542.3   | $1541^{+25}_{-24}$           |
| $\Omega_c h^2$              | 0.12065  | $0.1205^{+0.0031}_{-0.0030}$    | $S_8$                       | 0.8399   | $0.838^{+0.032}_{-0.032}$       | $H(0.51)$                   | 89.32    | $89.36^{+0.72}_{-0.70}$      |
| $100\theta_{MC}$            | 1.04081  | $1.04083^{+0.00088}_{-0.00090}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4601   | $0.459^{+0.018}_{-0.017}$       | $D_M(0.51)$                 | 1996.5   | $1995^{+29}_{-28}$           |
| $\tau$                      | 0.0529   | $0.053^{+0.016}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6114   | $0.610^{+0.015}_{-0.015}$       | $H(0.61)$                   | 95.00    | $95.04^{+0.60}_{-0.58}$      |
| $\ln(10^{10} A_s)$          | 3.0410   | $3.041^{+0.029}_{-0.029}$       | $\sigma_8/h^{0.5}$          | 0.9935   | $0.992^{+0.021}_{-0.021}$       | $D_M(0.61)$                 | 2322.0   | $2320^{+31}_{-31}$           |
| $n_s$                       | 0.9632   | $0.9638^{+0.0099}_{-0.0097}$    | $r_{drag} h$                | 98.44    | $98.6^{+2.4}_{-2.4}$            | $H(2.33)$                   | 236.72   | $236.6^{+1.9}_{-1.8}$        |
| $r$                         | 0.0132   | $< 0.0597$                      | $\langle d^2 \rangle^{1/2}$ | 2.4535   | $2.450^{+0.049}_{-0.049}$       | $D_M(2.33)$                 | 5777.7   | $5776^{+28}_{-28}$           |
| $y_{cal}$                   | 1.00056  | $1.0007^{+0.0049}_{-0.0049}$    | $z_{re}$                    | 7.61     | $7.6^{+1.5}_{-1.6}$             | $f\sigma_8(0.15)$           | 0.4639   | $0.463^{+0.016}_{-0.016}$    |
| $A_{B,dust}$                | 4.61     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.093    | $2.092^{+0.061}_{-0.060}$       | $\sigma_8(0.15)$            | 0.7498   | $0.749^{+0.011}_{-0.011}$    |
| $A_{B,sync}$                | 1.47     | $< 3.65$                        | $10^9 A_s e^{-2\tau}$       | 1.8824   | $1.882^{+0.022}_{-0.022}$       | $f\sigma_8(0.38)$           | 0.4802   | $0.479^{+0.012}_{-0.012}$    |
| $\alpha_{B,dust}$           | -0.52    | —                               | $D_{40}$                    | 1235.3   | $1239^{+27}_{-26}$              | $\sigma_8(0.38)$            | 0.6637   | $0.6633^{+0.0094}_{-0.0094}$ |
| $\beta_{B,dust}$            | 1.576    | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5703     | $5705^{+81}_{-79}$              | $f\sigma_8(0.51)$           | 0.4777   | $0.477^{+0.010}_{-0.011}$    |
| $\alpha_{B,sync}$           | -0.27    | —                               | $D_{810}$                   | 2534.3   | $2535^{+27}_{-26}$              | $\sigma_8(0.51)$            | 0.6207   | $0.6204^{+0.0090}_{-0.0089}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                  | 814.0    | $815^{+10}_{-10}$               | $f\sigma_8(0.61)$           | 0.4720   | $0.4713^{+0.0092}_{-0.0094}$ |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.35^{+0.52}_{-0.57}$         | $D_{2000}$                  | 229.47   | $229.6^{+3.6}_{-3.6}$           | $\sigma_8(0.61)$            | 0.5903   | $0.5901^{+0.0087}_{-0.0085}$ |
| $A_{100}^{PS}$              | 240.5    | $242^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9632   | $0.9638^{+0.0099}_{-0.0097}$    | $f\sigma_8(2.33)$           | 0.29730  | $0.2972^{+0.0046}_{-0.0045}$ |
| $A_{143}^{PS}$              | 39.3     | $41^{+20}_{-20}$                | $Y_P$                       | 0.245289 | $0.24529^{+0.00017}_{-0.00020}$ | $\sigma_8(2.33)$            | 0.3061   | $0.3061^{+0.0051}_{-0.0050}$ |
| $A_{217}^{PS}$              | 99.6     | $102^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246615 | $0.24661^{+0.00017}_{-0.00020}$ | $r_{0.002}$                 | 0.0118   | $< 0.0546$                   |
| $A_{217}^{CIB}$             | 45.3     | $41^{+10}_{-10}$                | $10^5 D/H$                  | 2.635    | $2.633^{+0.079}_{-0.078}$       | $r_{0.01}$                  | 0.0125   | $< 0.0571$                   |
| $A_{143}^{tSZ}$             | 5.64     | $< 7.39$                        | Age/Gyr                     | 13.830   | $13.827^{+0.064}_{-0.064}$      | $\ln(10^{10} A_t)$          | -1.29    | $-0.9^{+1.5}_{-2.1}$         |
| $r_{143 \times 217}^{PS}$   | 0.562    | $0.65^{+0.25}_{-0.25}$          | $z_*$                       | 1090.31  | $1090.28^{+0.70}_{-0.69}$       | $r_{10}$                    | 0.0060   | $< 0.0281$                   |
| $r_{143 \times 217}^{CIB}$  | 0.75     | —                               | $r_*$                       | 144.46   | $144.50^{+0.71}_{-0.72}$        | $10^9 A_t$                  | 0.028    | $< 0.125$                    |
| $\xi^{tSZ \times CIB}$      | 0.01     | —                               | $100\theta_*$               | 1.04101  | $1.04104^{+0.00086}_{-0.00089}$ | $10^9 A_t e^{-2\tau}$       | 0.025    | $< 0.112$                    |
| $A^{kSZ}$                   | 1.6      | —                               | $D_M(z_*)/\text{Gpc}$       | 13.877   | $13.880^{+0.067}_{-0.068}$      | $f_{2000}^{143}$            | 31.3     | $31^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.003    | $1.01^{+0.38}_{-0.38}$          | $z_{drag}$                  | 1059.40  | $1059.39^{+0.88}_{-0.87}$       | $f_{2000}^{217}$            | 107.83   | $107.7^{+3.9}_{-4.0}$        |
| $A_{143}^{dust}$            | 0.986    | $0.97^{+0.35}_{-0.35}$          | $r_{drag}$                  | 147.21   | $147.25^{+0.73}_{-0.74}$        | $f_{2000}^{143 \times 217}$ | 33.19    | $33^{+4}_{-4}$               |
| $A_{217}^{dust}$            | 0.961    | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | 0.14054  | $0.14051^{+0.00088}_{-0.00087}$ | $\chi^2_{lensing}$          | 9.00     | $9.56 (\nu: 0.4)$            |
| $A_{143 \times 217}^{dust}$ | 0.999    | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | 0.16108  | $0.16108^{+0.00052}_{-0.00051}$ | $\chi^2_{BKPLANCK}$         | 735.17   | $739.4 (\nu: 3.5)$           |
| $c_{100}$                   | 0.99746  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{eq}$                    | 3412     | $3408^{+71}_{-69}$              | $\chi^2_{small}$            | 396.01   | $397.0 (\nu: 1.3)$           |
| $c_{217}$                   | 1.00143  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{eq}$                    | 0.010412 | $0.01040^{+0.00022}_{-0.00021}$ | $\chi^2_{lowl}$             | 23.99    | $24.4 (\nu: 0.8)$            |
| $H_0$                       | 66.87    | $67.0^{+1.4}_{-1.4}$            | $100\theta_{eq}$            | 0.8108   | $0.812^{+0.013}_{-0.013}$       | $\chi^2_{CamSpec}$          | 7049.8   | $7062.6 (\nu: 13.2)$         |
| $\Omega_\Lambda$            | 0.6793   | $0.680^{+0.019}_{-0.020}$       | $100\theta_{s,eq}$          | 0.4483   | $0.4487^{+0.0067}_{-0.0067}$    | $\chi^2_{prior}$            | 2.4      | $9.2 (\nu: 7.3)$             |
| $\Omega_m$                  | 0.3207   | $0.320^{+0.020}_{-0.019}$       | $H(0.15)$                   | 72.25    | $72.3^{+1.2}_{-1.2}$            | $\chi^2_{CMB}$              | 8214.0   | $8233.0 (\nu: 18.7)$         |
| $\Omega_m h^2$              | 0.14341  | $0.1432^{+0.0030}_{-0.0029}$    | $D_M(0.15)$                 | 647.6    | $647^{+12}_{-12}$               |                             |          |                              |
| $\Omega_m h^3$              | 0.09590  | $0.09590^{+0.00089}_{-0.00088}$ | $H(0.38)$                   | 82.51    | $82.57^{+0.89}_{-0.87}$         |                             |          |                              |

Best-fit  $\chi^2_{\text{eff}} = 8216.43$ ;  $\bar{\chi}^2_{\text{eff}} = 8242.24$ ;  $R - 1 = 0.00337$

$\chi^2_{\text{eff}}$ : CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p.teb\_consext8: 9.00 BK15\_dust: 735.17 small.100x143\_offlike5\_EE\_Aplanck\_B: 396.01 commander\_dx12\_v3\_2.29: 23.99 CamSpec like\_10.7HM: 7049.83



### 13.16 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_lensing

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022189 | $0.02221^{+0.00038}_{-0.00038}$ | $S_8$                       | 0.8268   | $0.826^{+0.023}_{-0.023}$       | $D_M(0.51)$                 | 1985.4   | $1984^{+20}_{-20}$           |
| $\Omega_c h^2$                       | 0.11942  | $0.1193^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4529   | $0.452^{+0.013}_{-0.013}$       | $H(0.61)$                   | 95.200   | $95.24^{+0.46}_{-0.46}$      |
| $100\theta_{MC}$                     | 1.04098  | $1.04102^{+0.00081}_{-0.00083}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6055   | $0.605^{+0.012}_{-0.012}$       | $D_M(0.61)$                 | 2310.1   | $2308^{+22}_{-22}$           |
| $\tau$                               | 0.0546   | $0.056^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | 0.9860   | $0.986^{+0.018}_{-0.018}$       | $H(2.33)$                   | 236.00   | $235.9^{+1.4}_{-1.3}$        |
| $\ln(10^{10} A_s)$                   | 3.0425   | $3.045^{+0.028}_{-0.028}$       | $r_{\text{drag}} h$         | 99.42    | $99.6^{+1.6}_{-1.6}$            | $D_M(2.33)$                 | 5769.3   | $5768^{+23}_{-23}$           |
| $n_s$                                | 0.9658   | $0.9667^{+0.0083}_{-0.0081}$    | $\langle d^2 \rangle^{1/2}$ | 2.4370   | $2.436^{+0.041}_{-0.042}$       | $f\sigma_8(0.15)$           | 0.4573   | $0.457^{+0.012}_{-0.012}$    |
| $r$                                  | 0.0130   | $< 0.0613$                      | $z_{\text{re}}$             | 7.74     | $7.9^{+1.4}_{-1.4}$             | $\sigma_8(0.15)$            | 0.7480   | $0.749^{+0.011}_{-0.011}$    |
| $y_{\text{cal}}$                     | 1.00083  | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | 2.096    | $2.101^{+0.060}_{-0.058}$       | $f\sigma_8(0.38)$           | 0.4754   | $0.4752^{+0.0099}_{-0.0098}$ |
| $A_{B,\text{dust}}$                  | 4.59     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | 1.8789   | $1.878^{+0.021}_{-0.021}$       | $\sigma_8(0.38)$            | 0.6629   | $0.6636^{+0.0095}_{-0.0093}$ |
| $A_{B,\text{sync}}$                  | 1.46     | $< 3.68$                        | $D_{40}$                    | 1231.2   | $1235^{+26}_{-25}$              | $f\sigma_8(0.51)$           | 0.4738   | $0.4738^{+0.0087}_{-0.0088}$ |
| $\alpha_{B,\text{dust}}$             | -0.50    | —                               | $D_{220}$                   | 5715     | $5714^{+79}_{-79}$              | $\sigma_8(0.51)$            | 0.6203   | $0.6210^{+0.0089}_{-0.0087}$ |
| $\beta_{B,\text{dust}}$              | 1.573    | $1.59^{+0.19}_{-0.19}$          | $D_{810}$                   | 2535.6   | $2536^{+27}_{-26}$              | $f\sigma_8(0.61)$           | 0.4687   | $0.4688^{+0.0081}_{-0.0081}$ |
| $\alpha_{B,\text{sync}}$             | -0.41    | —                               | $D_{1420}$                  | 815.3    | $815.8^{+9.8}_{-9.8}$           | $\sigma_8(0.61)$            | 0.5902   | $0.5909^{+0.0086}_{-0.0083}$ |
| $\beta_{B,\text{sync}}$              | -3.03    | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | 229.91   | $230.1^{+3.5}_{-3.5}$           | $f\sigma_8(2.33)$           | 0.29752  | $0.2979^{+0.0044}_{-0.0043}$ |
| $\epsilon_{\text{dust,sync}}$        | -0.32    | $-0.35^{+0.52}_{-0.57}$         | $n_{s,0.002}$               | 0.9658   | $0.9667^{+0.0083}_{-0.0081}$    | $\sigma_8(2.33)$            | 0.30666  | $0.3071^{+0.0047}_{-0.0046}$ |
| $A_{100}^{\text{PS}}$                | 239.7    | $242^{+50}_{-50}$               | $Y_P$                       | 0.245321 | $0.24533^{+0.00016}_{-0.00016}$ | $r_{0.002}$                 | 0.0117   | $< 0.0566$                   |
| $A_{143}^{\text{PS}}$                | 40.7     | $41^{+20}_{-20}$                | $Y_P^{\text{BBN}}$          | 0.246648 | $0.24665^{+0.00016}_{-0.00016}$ | $r_{0.01}$                  | 0.0123   | $< 0.0589$                   |
| $A_{217}^{\text{PS}}$                | 100.5    | $102^{+30}_{-30}$               | $10^5 D/H$                  | 2.620    | $2.617^{+0.072}_{-0.071}$       | $\ln(10^{10} A_t)$          | -1.30    | $-0.9^{+1.5}_{-2.0}$         |
| $A_{217}^{\text{CIB}}$               | 44.9     | $40^{+10}_{-10}$                | Age/Gyr                     | 13.812   | $13.808^{+0.053}_{-0.054}$      | $r_{10}$                    | 0.0060   | $< 0.0289$                   |
| $A_{143}^{\text{tSZ}}$               | 5.78     | $< 7.40$                        | $z_*$                       | 1090.10  | $1090.06^{+0.56}_{-0.56}$       | $10^9 A_t$                  | 0.027    | $< 0.129$                    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.583    | $0.65^{+0.25}_{-0.25}$          | $r_*$                       | 144.72   | $144.75^{+0.55}_{-0.56}$        | $10^9 A_t e^{-2\tau}$       | 0.024    | $< 0.115$                    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.76     | —                               | $100\theta_*$               | 1.04118  | $1.04122^{+0.00080}_{-0.00082}$ | $f_{2000}^{143}$            | 31.0     | $30^{+6}_{-6}$               |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.10     | —                               | $D_M(z_*)/\text{Gpc}$       | 13.899   | $13.902^{+0.054}_{-0.055}$      | $f_{2000}^{217}$            | 107.56   | $107.4^{+3.9}_{-4.0}$        |
| $A^{\text{kSZ}}$                     | 1.3      | —                               | $z_{\text{drag}}$           | 1059.47  | $1059.50^{+0.85}_{-0.87}$       | $f_{2000}^{143 \times 217}$ | 32.87    | $33^{+4}_{-4}$               |
| $A_{100}^{\text{dust}}$              | 1.011    | $1.01^{+0.38}_{-0.38}$          | $r_{\text{drag}}$           | 147.45   | $147.47^{+0.62}_{-0.62}$        | $\chi_{\text{lensing}}^2$   | 8.90     | $9.33 (\nu: 0.3)$            |
| $A_{143}^{\text{dust}}$              | 0.977    | $0.97^{+0.35}_{-0.34}$          | $k_D$                       | 0.14035  | $0.14034^{+0.00083}_{-0.00081}$ | $\chi_{\text{BKPLANCK}}^2$  | 735.61   | $739.8 (\nu: 3.4)$           |
| $A_{217}^{\text{dust}}$              | 0.966    | $0.97^{+0.20}_{-0.20}$          | $100\theta_D$               | 0.16104  | $0.16103^{+0.00050}_{-0.00050}$ | $\chi_{\text{simall}}^2$    | 396.19   | $397.4 (\nu: 1.8)$           |
| $A_{143 \times 217}^{\text{dust}}$   | 1.002    | $1.03^{+0.32}_{-0.31}$          | $z_{\text{eq}}$             | 3384.1   | $3380^{+50}_{-49}$              | $\chi_{\text{lowl}}^2$      | 23.50    | $23.9 (\nu: 0.6)$            |
| $c_{100}$                            | 0.99759  | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\text{eq}}$             | 0.010329 | $0.01032^{+0.00015}_{-0.00015}$ | $\chi_{\text{CamSpec}}^2$   | 7050.6   | $7062.9 (\nu: 13.1)$         |
| $c_{217}$                            | 1.00142  | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{\text{eq}}$     | 0.8161   | $0.8169^{+0.0092}_{-0.0091}$    | $\chi_{6\text{DF}}^2$       | 0.047    | $0.064 (\nu: 0.0)$           |
| $H_0$                                | 67.43    | $67.52^{+0.98}_{-0.96}$         | $100\theta_{s,\text{eq}}$   | 0.45098  | $0.4514^{+0.0047}_{-0.0047}$    | $\chi_{\text{MGS}}^2$       | 1.10     | $1.24 (\nu: 0.1)$            |
| $\Omega_\Lambda$                     | 0.6871   | $0.688^{+0.013}_{-0.013}$       | $H(0.15)$                   | 72.72    | $72.80^{+0.85}_{-0.84}$         | $\chi_{\text{DR12BAO}}^2$   | 4.77     | $5.0 (\nu: 1.3)$             |
| $\Omega_m$                           | 0.3129   | $0.312^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | 642.9    | $642.1^{+8.4}_{-8.3}$           | $\chi_{\text{prior}}^2$     | 2.3      | $9.2 (\nu: 7.3)$             |
| $\Omega_m h^2$                       | 0.14226  | $0.1421^{+0.0021}_{-0.0020}$    | $H(0.38)$                   | 82.85    | $82.91^{+0.65}_{-0.63}$         | $\chi_{\text{CMB}}^2$       | 8214.8   | $8233.2 (\nu: 18.3)$         |
| $\Omega_m h^3$                       | 0.09592  | $0.09594^{+0.00088}_{-0.00087}$ | $D_M(0.38)$                 | 1532.8   | $1531^{+17}_{-17}$              | $\chi_{\text{BAO}}^2$       | 5.92     | $6.3 (\nu: 0.9)$             |
| $\sigma_8$                           | 0.8096   | $0.810^{+0.012}_{-0.012}$       | $H(0.51)$                   | 89.57    | $89.62^{+0.54}_{-0.53}$         |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 8223.00$ ;  $\bar{\chi}_{\text{eff}}^2 = 8248.72$ ;  $R - 1 = 0.00847$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.05 MGS: 1.10 DR12BAO: 4.77 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.90 BK15\_dust: 735.61 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.19 commander\_dx12\_v3.2.29: 23.50 CamSpec like\_10.7HM: 7050.59



### 13.17 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02210^{+0.00044}_{-0.00042}$ | $\Omega_{\mathrm{m}}h^3$             | $0.09592^{+0.00090}_{-0.00088}$ | $D_{\mathrm{M}}(0.15)$          | $649^{+16}_{-15}$            |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1209^{+0.0041}_{-0.0040}$    | $\sigma_8$                           | $0.815^{+0.017}_{-0.016}$       | $H(0.38)$                       | $82.5^{+1.1}_{-1.1}$         |
| $100\theta_{\mathrm{MC}}$                | $1.04079^{+0.00092}_{-0.00094}$ | $S_8$                                | $0.845^{+0.048}_{-0.046}$       | $D_{\mathrm{M}}(0.38)$          | $1544^{+31}_{-31}$           |
| $\tau$                                   | $0.054^{+0.013}_{-0.012}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.463^{+0.026}_{-0.025}$       | $H(0.51)$                       | $89.28^{+0.88}_{-0.84}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.044^{+0.028}_{-0.026}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.614^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.51)$          | $1999^{+36}_{-36}$           |
| $n_{\mathrm{s}}$                         | $0.963^{+0.011}_{-0.011}$       | $\sigma_8/h^{0.5}$                   | $0.997^{+0.031}_{-0.030}$       | $H(0.61)$                       | $94.98^{+0.70}_{-0.67}$      |
| $r$                                      | $< 0.0591$                      | $r_{\mathrm{drag}}h$                 | $98.2^{+3.2}_{-3.1}$            | $D_{\mathrm{M}}(0.61)$          | $2324^{+39}_{-39}$           |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0049}_{-0.0049}$    | $\langle d^2 \rangle^{1/2}$          | $2.461^{+0.074}_{-0.072}$       | $H(2.33)$                       | $236.9^{+2.5}_{-2.4}$        |
| $A_{B,\mathrm{dust}}$                    | $4.9^{+2.1}_{-1.9}$             | $z_{\mathrm{re}}$                    | $< 8.91$                        | $D_{\mathrm{M}}(2.33)$          | $5779^{+32}_{-32}$           |
| $A_{B,\mathrm{sync}}$                    | $< 3.68$                        | $10^9 A_{\mathrm{s}}$                | $2.100^{+0.059}_{-0.055}$       | $f\sigma_8(0.15)$               | $0.466^{+0.024}_{-0.023}$    |
| $\alpha_{B,\mathrm{dust}}$               | —                               | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.884^{+0.027}_{-0.026}$       | $\sigma_8(0.15)$                | $0.752^{+0.014}_{-0.013}$    |
| $\beta_{B,\mathrm{dust}}$                | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                             | $1241^{+31}_{-30}$              | $f\sigma_8(0.38)$               | $0.482^{+0.019}_{-0.018}$    |
| $\alpha_{B,\mathrm{sync}}$               | —                               | $D_{220}$                            | $5702^{+81}_{-80}$              | $\sigma_8(0.38)$                | $0.665^{+0.011}_{-0.010}$    |
| $\beta_{B,\mathrm{sync}}$                | $-3.10^{+0.52}_{-0.55}$         | $D_{810}$                            | $2536^{+27}_{-27}$              | $f\sigma_8(0.51)$               | $0.479^{+0.016}_{-0.016}$    |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$ | $-0.35^{+0.52}_{-0.57}$         | $D_{1420}$                           | $814^{+10}_{-10}$               | $\sigma_8(0.51)$                | $0.6219^{+0.0097}_{-0.0094}$ |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{2000}$                           | $229.6^{+3.6}_{-3.6}$           | $f\sigma_8(0.61)$               | $0.474^{+0.014}_{-0.014}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $n_{\mathrm{s},0.002}$               | $0.963^{+0.011}_{-0.011}$       | $\sigma_8(0.61)$                | $0.5915^{+0.0090}_{-0.0086}$ |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $Y_{\mathrm{P}}$                     | $0.24528^{+0.00018}_{-0.00021}$ | $f\sigma_8(2.33)$               | $0.2978^{+0.0044}_{-0.0041}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24660^{+0.00018}_{-0.00021}$ | $\sigma_8(2.33)$                | $0.3066^{+0.0046}_{-0.0043}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.38$                        | $10^5\mathrm{D}/\mathrm{H}$          | $2.638^{+0.083}_{-0.082}$       | $r_{0.002}$                     | $< 0.0540$                   |
| $r_{143\times 217}^{\mathrm{PS}}$        | $0.65^{+0.25}_{-0.25}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.832^{+0.071}_{-0.071}$      | $r_{0.01}$                      | $< 0.0565$                   |
| $r_{143\times 217}^{\mathrm{CIB}}$       | —                               | $z_*$                                | $1090.35^{+0.80}_{-0.79}$       | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.97^{+1.5}_{-2.1}$        |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$   | —                               | $r_*$                                | $144.40^{+0.93}_{-0.94}$        | $r_{10}$                        | $< 0.0277$                   |
| $A^{\mathrm{kSZ}}$                       | —                               | $100\theta_*$                        | $1.04100^{+0.00090}_{-0.00092}$ | $10^9 A_{\mathrm{t}}$           | $< 0.124$                    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.871^{+0.086}_{-0.087}$      | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.111$                    |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.34}$          | $z_{\mathrm{drag}}$                  | $1059.37^{+0.91}_{-0.89}$       | $f_{2000}^{143}$                | $31^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_{\mathrm{drag}}$                  | $147.15^{+0.93}_{-0.95}$        | $f_{2000}^{217}$                | $107.6^{+4.0}_{-4.0}$        |
| $A_{143\times 217}^{\mathrm{dust}}$      | $1.03^{+0.32}_{-0.32}$          | $k_{\mathrm{D}}$                     | $0.1406^{+0.0010}_{-0.0010}$    | $f_{2000}^{143\times 217}$      | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_{\mathrm{D}}$             | $0.16110^{+0.00052}_{-0.00052}$ | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.2 (\nu: 3.6)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\mathrm{eq}}$                    | $3418^{+95}_{-92}$              | $\chi_{\mathrm{simall}}^2$      | $397.0 (\nu: 1.5)$           |
| $H_0$                                    | $66.8^{+1.8}_{-1.8}$            | $k_{\mathrm{eq}}$                    | $0.01043^{+0.00029}_{-0.00028}$ | $\chi_{\mathrm{lowl}}^2$        | $24.7 (\nu: 1.1)$            |
| $\Omega_{\Lambda}$                       | $0.677^{+0.025}_{-0.026}$       | $100\theta_{\mathrm{eq}}$            | $0.810^{+0.017}_{-0.017}$       | $\chi_{\mathrm{CamSpec}}^2$     | $7062.9 (\nu: 13.9)$         |
| $\Omega_{\mathrm{m}}$                    | $0.323^{+0.026}_{-0.025}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4477^{+0.0089}_{-0.0089}$    | $\chi_{\mathrm{prior}}^2$       | $9.2 (\nu: 7.2)$             |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1437^{+0.0040}_{-0.0038}$    | $H(0.15)$                            | $72.2^{+1.5}_{-1.5}$            | $\chi_{\mathrm{CMB}}^2$         | $8223.8 (\nu: 18.4)$         |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8233.01; R - 1 = 0.00318$$



### 13.18 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02221^{+0.00039}_{-0.00038}$ | $S_8$                       | $0.824^{+0.029}_{-0.028}$       | $D_M(0.51)$                 | $1982^{+21}_{-22}$           |
| $\Omega_c h^2$                       | $0.1191^{+0.0024}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.016}_{-0.015}$       | $H(0.61)$                   | $95.26^{+0.48}_{-0.47}$      |
| $100\theta_{MC}$                     | $1.04104^{+0.00081}_{-0.00083}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.604^{+0.015}_{-0.015}$       | $D_M(0.61)$                 | $2307^{+23}_{-23}$           |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.984^{+0.022}_{-0.021}$       | $H(2.33)$                   | $235.8^{+1.5}_{-1.5}$        |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.029}_{-0.027}$       | $r_{\text{drag}} h$         | $99.7^{+1.8}_{-1.8}$            | $D_M(2.33)$                 | $5767^{+24}_{-24}$           |
| $n_s$                                | $0.9673^{+0.0084}_{-0.0084}$    | $\langle d^2 \rangle^{1/2}$ | $2.432^{+0.052}_{-0.050}$       | $f\sigma_8(0.15)$           | $0.456^{+0.015}_{-0.014}$    |
| $r$                                  | $< 0.0624$                      | $z_{\text{re}}$             | $< 9.02$                        | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.012}$    |
| $y_{\text{cal}}$                     | $1.0008^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.098^{+0.060}_{-0.057}$       | $f\sigma_8(0.38)$           | $0.474^{+0.012}_{-0.012}$    |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.023}_{-0.023}$       | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.010}$    |
| $A_{B,\text{sync}}$                  | $< 3.68$                        | $D_{40}$                    | $1233^{+28}_{-27}$              | $f\sigma_8(0.51)$           | $0.473^{+0.011}_{-0.011}$    |
| $\alpha_{B,\text{dust}}$             | —                               | $D_{220}$                   | $5710^{+80}_{-79}$              | $\sigma_8(0.51)$            | $0.6205^{+0.0096}_{-0.0092}$ |
| $\beta_{B,\text{dust}}$              | $1.59^{+0.19}_{-0.19}$          | $D_{810}$                   | $2535^{+27}_{-27}$              | $f\sigma_8(0.61)$           | $0.468^{+0.010}_{-0.0098}$   |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{1420}$                  | $815.5^{+9.9}_{-9.9}$           | $\sigma_8(0.61)$            | $0.5904^{+0.0091}_{-0.0087}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | $230.1^{+3.5}_{-3.5}$           | $f\sigma_8(2.33)$           | $0.2977^{+0.0045}_{-0.0043}$ |
| $\epsilon_{\text{dust,sync}}$        | $-0.35^{+0.52}_{-0.57}$         | $n_{s,0.002}$               | $0.9673^{+0.0084}_{-0.0084}$    | $\sigma_8(2.33)$            | $0.3070^{+0.0047}_{-0.0044}$ |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $Y_{\text{P}}$              | $0.24533^{+0.00015}_{-0.00017}$ | $r_{0.002}$                 | $< 0.0577$                   |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $Y_{\text{P}}^{\text{BBN}}$ | $0.24665^{+0.00015}_{-0.00017}$ | $r_{0.01}$                  | $< 0.0601$                   |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $10^5 \text{D/H}$           | $2.617^{+0.072}_{-0.072}$       | $\ln(10^{10} A_t)$          | $-0.9^{+1.5}_{-2.0}$         |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $\text{Age/Gyr}$            | $13.807^{+0.054}_{-0.054}$      | $r_{10}$                    | $< 0.0295$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.41$                        | $z_*$                       | $1090.05^{+0.57}_{-0.57}$       | $10^9 A_t$                  | $< 0.131$                    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $r_*$                       | $144.79^{+0.61}_{-0.62}$        | $10^9 A_t e^{-2\tau}$       | $< 0.117$                    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $100\theta_*$               | $1.04124^{+0.00080}_{-0.00082}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $D_M(z_*)/\text{Gpc}$       | $13.906^{+0.060}_{-0.060}$      | $f_{2000}^{217}$            | $107.4^{+4.0}_{-4.0}$        |
| $A^{\text{kSZ}}$                     | —                               | $z_{\text{drag}}$           | $1059.49^{+0.86}_{-0.85}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_{\text{drag}}$           | $147.52^{+0.66}_{-0.67}$        | $\chi_{\text{BKPLANCK}}^2$  | $739.9 (\nu: 3.5)$           |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $k_{\text{D}}$              | $0.14029^{+0.00087}_{-0.00085}$ | $\chi_{\text{simall}}^2$    | $397.2 (\nu: 1.9)$           |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_{\text{D}}$      | $0.16104^{+0.00049}_{-0.00050}$ | $\chi_{\text{lowl}}^2$      | $23.8 (\nu: 0.6)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $z_{\text{eq}}$             | $3376^{+56}_{-55}$              | $\chi_{\text{CamSpec}}^2$   | $7063.2 (\nu: 13.5)$         |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\text{eq}}$             | $0.01031^{+0.00017}_{-0.00017}$ | $\chi_{6\text{DF}}^2$       | $0.062 (\nu: 0.0)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $100\theta_{\text{eq}}$     | $0.818^{+0.010}_{-0.010}$       | $\chi_{\text{MGS}}^2$       | $1.31 (\nu: 0.1)$            |
| $H_0$                                | $67.6^{+1.1}_{-1.1}$            | $100\theta_{s,\text{eq}}$   | $0.4517^{+0.0054}_{-0.0053}$    | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.4)$             |
| $\Omega_{\Lambda}$                   | $0.689^{+0.014}_{-0.014}$       | $H(0.15)$                   | $72.85^{+0.92}_{-0.90}$         | $\chi_{\text{prior}}^2$     | $9.2 (\nu: 7.3)$             |
| $\Omega_{\text{m}}$                  | $0.311^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $641.6^{+9.1}_{-9.1}$           | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 1.0)$             |
| $\Omega_{\text{m}} h^2$              | $0.1419^{+0.0023}_{-0.0023}$    | $H(0.38)$                   | $82.94^{+0.69}_{-0.68}$         | $\chi_{\text{CMB}}^2$       | $8224.1 (\nu: 17.7)$         |
| $\Omega_{\text{m}} h^3$              | $0.09592^{+0.00089}_{-0.00088}$ | $D_M(0.38)$                 | $1530^{+18}_{-18}$              |                             |                              |
| $\sigma_8$                           | $0.809^{+0.015}_{-0.013}$       | $H(0.51)$                   | $89.65^{+0.57}_{-0.55}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8239.57; R - 1 = 0.00860$$



### 13.19 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02213^{+0.00041}_{-0.00040}$ | $\sigma_8$                  | $0.812^{+0.012}_{-0.011}$       | $D_M(0.38)$                 | $1540^{+23}_{-24}$           |
| $\Omega_c h^2$                       | $0.1203^{+0.0030}_{-0.0030}$    | $S_8$                       | $0.837^{+0.032}_{-0.032}$       | $H(0.51)$                   | $89.39^{+0.71}_{-0.68}$      |
| $100\theta_{MC}$                     | $1.04085^{+0.00087}_{-0.00089}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.459^{+0.018}_{-0.017}$       | $D_M(0.51)$                 | $1994^{+27}_{-28}$           |
| $\tau$                               | $0.054^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.610^{+0.015}_{-0.015}$       | $H(0.61)$                   | $95.06^{+0.59}_{-0.56}$      |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.025}_{-0.024}$       | $\sigma_8/h^{0.5}$          | $0.992^{+0.020}_{-0.021}$       | $D_M(0.61)$                 | $2319^{+30}_{-30}$           |
| $n_s$                                | $0.9642^{+0.0097}_{-0.0094}$    | $r_{\text{drag}} h$         | $98.7^{+2.4}_{-2.3}$            | $H(2.33)$                   | $236.5^{+1.8}_{-1.8}$        |
| $r$                                  | $< 0.0598$                      | $\langle d^2 \rangle^{1/2}$ | $2.451^{+0.049}_{-0.049}$       | $D_M(2.33)$                 | $5775^{+28}_{-28}$           |
| $y_{\text{cal}}$                     | $1.0007^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$             | $< 8.87$                        | $f\sigma_8(0.15)$           | $0.463^{+0.016}_{-0.016}$    |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | $2.097^{+0.053}_{-0.050}$       | $\sigma_8(0.15)$            | $0.750^{+0.010}_{-0.0097}$   |
| $A_{B,\text{sync}}$                  | $< 3.65$                        | $10^9 A_s e^{-2\tau}$       | $1.882^{+0.022}_{-0.022}$       | $f\sigma_8(0.38)$           | $0.479^{+0.012}_{-0.012}$    |
| $\alpha_{B,\text{dust}}$             | —                               | $D_{40}$                    | $1239^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.6640^{+0.0090}_{-0.0080}$ |
| $\beta_{B,\text{dust}}$              | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | $5705^{+81}_{-79}$              | $f\sigma_8(0.51)$           | $0.477^{+0.010}_{-0.011}$    |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{810}$                   | $2535^{+27}_{-26}$              | $\sigma_8(0.51)$            | $0.6211^{+0.0081}_{-0.0077}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                  | $815^{+10}_{-10}$               | $f\sigma_8(0.61)$           | $0.4715^{+0.0092}_{-0.0093}$ |
| $\epsilon_{\text{dust,sync}}$        | $-0.35^{+0.52}_{-0.57}$         | $D_{2000}$                  | $229.7^{+3.6}_{-3.6}$           | $\sigma_8(0.61)$            | $0.5908^{+0.0077}_{-0.0073}$ |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $n_{s,0.002}$               | $0.9642^{+0.0097}_{-0.0094}$    | $f\sigma_8(2.33)$           | $0.2976^{+0.0040}_{-0.0038}$ |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $Y_P$                       | $0.24529^{+0.00017}_{-0.00019}$ | $\sigma_8(2.33)$            | $0.3065^{+0.0044}_{-0.0042}$ |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $Y_P^{\text{BBN}}$          | $0.24662^{+0.00017}_{-0.00019}$ | $r_{0.002}$                 | $< 0.0549$                   |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $10^5 \text{D/H}$           | $2.631^{+0.078}_{-0.077}$       | $r_{0.01}$                  | $< 0.0572$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.40$                        | $\text{Age/Gyr}$            | $13.825^{+0.063}_{-0.063}$      | $\ln(10^{10} A_t)$          | $-0.9^{+1.5}_{-2.1}$         |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $z_*$                       | $1090.25^{+0.68}_{-0.67}$       | $r_{10}$                    | $< 0.0282$                   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $r_*$                       | $144.53^{+0.70}_{-0.70}$        | $10^9 A_t$                  | $< 0.126$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $100\theta_*$               | $1.04105^{+0.00086}_{-0.00088}$ | $10^9 A_t e^{-2\tau}$       | $< 0.113$                    |
| $A^{\text{kSZ}}$                     | —                               | $D_M(z_*)/\text{Gpc}$       | $13.883^{+0.066}_{-0.066}$      | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_{\text{drag}}$           | $1059.41^{+0.87}_{-0.89}$       | $f_{2000}^{217}$            | $107.6^{+3.9}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.35}$          | $r_{\text{drag}}$           | $147.27^{+0.72}_{-0.73}$        | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $k_D$                       | $0.14050^{+0.00088}_{-0.00087}$ | $\chi_{\text{lensing}}^2$   | $9.54 (\nu: 0.4)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | $0.16107^{+0.00051}_{-0.00051}$ | $\chi_{\text{BKPLANCK}}^2$  | $739.4 (\nu: 3.5)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{eq}}$             | $3405^{+68}_{-67}$              | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.3)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{eq}}$             | $0.01039^{+0.00021}_{-0.00021}$ | $\chi_{\text{lowl}}^2$      | $24.4 (\nu: 0.7)$            |
| $H_0$                                | $67.0^{+1.4}_{-1.3}$            | $100\theta_{\text{eq}}$     | $0.812^{+0.013}_{-0.013}$       | $\chi_{\text{CamSpec}}^2$   | $7062.5 (\nu: 13.0)$         |
| $\Omega_\Lambda$                     | $0.681^{+0.018}_{-0.019}$       | $100\theta_{s,\text{eq}}$   | $0.4490^{+0.0065}_{-0.0065}$    | $\chi_{\text{prior}}^2$     | $9.2 (\nu: 7.3)$             |
| $\Omega_m$                           | $0.319^{+0.019}_{-0.018}$       | $H(0.15)$                   | $72.4^{+1.2}_{-1.1}$            | $\chi_{\text{CMB}}^2$       | $8232.8 (\nu: 18.2)$         |
| $\Omega_m h^2$                       | $0.1431^{+0.0029}_{-0.0028}$    | $D_M(0.15)$                 | $646^{+12}_{-12}$               |                             |                              |
| $\Omega_m h^3$                       | $0.09591^{+0.00089}_{-0.00088}$ | $H(0.38)$                   | $82.60^{+0.88}_{-0.84}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8241.99; R - 1 = 0.00437$$



### 13.20 base\_r\_CamSpecHM\_TT\_lowl\_lowE\_BK15\_post\_BAO\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02221^{+0.00038}_{-0.00037}$ | $S_8$                       | $0.826^{+0.023}_{-0.023}$       | $D_M(0.51)$                 | $1983^{+20}_{-20}$           |
| $\Omega_c h^2$                       | $0.1192^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.452^{+0.013}_{-0.013}$       | $H(0.61)$                   | $95.25^{+0.46}_{-0.46}$      |
| $100\theta_{MC}$                     | $1.04102^{+0.00081}_{-0.00083}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.012}_{-0.012}$       | $D_M(0.61)$                 | $2308^{+21}_{-22}$           |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.017}_{-0.017}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.3}$        |
| $\ln(10^{10} A_s)$                   | $3.046^{+0.026}_{-0.025}$       | $r_{\text{drag}} h$         | $99.6^{+1.6}_{-1.6}$            | $D_M(2.33)$                 | $5767^{+23}_{-23}$           |
| $n_s$                                | $0.9668^{+0.0083}_{-0.0080}$    | $\langle d^2 \rangle^{1/2}$ | $2.437^{+0.041}_{-0.042}$       | $f\sigma_8(0.15)$           | $0.457^{+0.012}_{-0.012}$    |
| $r$                                  | $< 0.0613$                      | $z_{\text{re}}$             | $7.9^{+1.2}_{-1.3}$             | $\sigma_8(0.15)$            | $0.749^{+0.011}_{-0.0099}$   |
| $y_{\text{cal}}$                     | $1.0009^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | $2.103^{+0.055}_{-0.053}$       | $f\sigma_8(0.38)$           | $0.4753^{+0.0098}_{-0.0098}$ |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.021}_{-0.021}$       | $\sigma_8(0.38)$            | $0.6639^{+0.0092}_{-0.0085}$ |
| $A_{B,\text{sync}}$                  | $< 3.67$                        | $D_{40}$                    | $1235^{+26}_{-25}$              | $f\sigma_8(0.51)$           | $0.4739^{+0.0087}_{-0.0087}$ |
| $\alpha_{B,\text{dust}}$             | —                               | $D_{220}$                   | $5714^{+79}_{-79}$              | $\sigma_8(0.51)$            | $0.6213^{+0.0087}_{-0.0079}$ |
| $\beta_{B,\text{dust}}$              | $1.60^{+0.19}_{-0.19}$          | $D_{810}$                   | $2536^{+27}_{-26}$              | $f\sigma_8(0.61)$           | $0.4689^{+0.0080}_{-0.0080}$ |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{1420}$                  | $815.7^{+9.8}_{-9.8}$           | $\sigma_8(0.61)$            | $0.5911^{+0.0083}_{-0.0075}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.54}$         | $D_{2000}$                  | $230.1^{+3.4}_{-3.5}$           | $f\sigma_8(2.33)$           | $0.2981^{+0.0043}_{-0.0038}$ |
| $\epsilon_{\text{dust,sync}}$        | $-0.35^{+0.52}_{-0.57}$         | $n_{s,0.002}$               | $0.9668^{+0.0083}_{-0.0080}$    | $\sigma_8(2.33)$            | $0.3073^{+0.0044}_{-0.0042}$ |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $Y_{\text{P}}$              | $0.24533^{+0.00016}_{-0.00016}$ | $r_{0.002}$                 | $< 0.0566$                   |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $Y_{\text{P}}^{\text{BBN}}$ | $0.24665^{+0.00016}_{-0.00016}$ | $r_{0.01}$                  | $< 0.0589$                   |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $10^5 \text{D/H}$           | $2.616^{+0.072}_{-0.071}$       | $\ln(10^{10} A_t)$          | $-0.9^{+1.5}_{-2.0}$         |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $\text{Age/Gyr}$            | $13.807^{+0.053}_{-0.053}$      | $r_{10}$                    | $< 0.0289$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.40$                        | $z_*$                       | $1090.06^{+0.56}_{-0.56}$       | $10^9 A_t$                  | $< 0.129$                    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $r_*$                       | $144.76^{+0.55}_{-0.56}$        | $10^9 A_t e^{-2\tau}$       | $< 0.115$                    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $100\theta_*$               | $1.04123^{+0.00080}_{-0.00082}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $D_M(z_*)/\text{Gpc}$       | $13.902^{+0.054}_{-0.055}$      | $f_{2000}^{217}$            | $107.4^{+3.9}_{-4.0}$        |
| $A^{\text{kSZ}}$                     | —                               | $z_{\text{drag}}$           | $1059.51^{+0.85}_{-0.87}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_{\text{drag}}$           | $147.48^{+0.62}_{-0.62}$        | $\chi_{\text{lensing}}^2$   | $9.30 (\nu: 0.2)$            |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $k_{\text{D}}$              | $0.14034^{+0.00083}_{-0.00081}$ | $\chi_{\text{BKPLANCK}}^2$  | $739.8 (\nu: 3.4)$           |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_{\text{D}}$      | $0.16103^{+0.00049}_{-0.00050}$ | $\chi_{\text{simall}}^2$    | $397.4 (\nu: 1.9)$           |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{eq}}$             | $3380^{+49}_{-49}$              | $\chi_{\text{lowl}}^2$      | $23.9 (\nu: 0.6)$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\text{eq}}$             | $0.01032^{+0.00015}_{-0.00015}$ | $\chi_{\text{CamSpec}}^2$   | $7062.8 (\nu: 13.0)$         |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_{\text{eq}}$     | $0.8170^{+0.0092}_{-0.0090}$    | $\chi_{6\text{DF}}^2$       | $0.062 (\nu: 0.0)$           |
| $H_0$                                | $67.53^{+0.97}_{-0.96}$         | $100\theta_{s,\text{eq}}$   | $0.4514^{+0.0047}_{-0.0047}$    | $\chi_{\text{MGS}}^2$       | $1.25 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                   | $0.688^{+0.013}_{-0.013}$       | $H(0.15)$                   | $72.81^{+0.84}_{-0.83}$         | $\chi_{\text{DR12BAO}}^2$   | $4.9 (\nu: 1.2)$             |
| $\Omega_{\text{m}}$                  | $0.312^{+0.013}_{-0.013}$       | $D_M(0.15)$                 | $642.0^{+8.3}_{-8.2}$           | $\chi_{\text{prior}}^2$     | $9.2 (\nu: 7.3)$             |
| $\Omega_{\text{m}} h^2$              | $0.1421^{+0.0021}_{-0.0020}$    | $H(0.38)$                   | $82.92^{+0.64}_{-0.63}$         | $\chi_{\text{CMB}}^2$       | $8233.1 (\nu: 18.1)$         |
| $\Omega_{\text{m}} h^3$              | $0.09594^{+0.00088}_{-0.00087}$ | $D_M(0.38)$                 | $1531^{+17}_{-17}$              | $\chi_{\text{BAO}}^2$       | $6.2 (\nu: 0.8)$             |
| $\sigma_8$                           | $0.810^{+0.012}_{-0.011}$       | $H(0.51)$                   | $89.63^{+0.54}_{-0.52}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8248.57; R - 1 = 0.00954$$



### 13.21 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022276 | $0.02228^{+0.00031}_{-0.00031}$ | $\Omega_m h^2$              | 0.14281  | $0.1427^{+0.0026}_{-0.0026}$    | $D_M(0.15)$                 | 644.0    | $644^{+10}_{-10}$            |
| $\Omega_c h^2$              | 0.11989  | $0.1198^{+0.0027}_{-0.0027}$    | $\Omega_m h^3$              | 0.09610  | $0.09608^{+0.00063}_{-0.00062}$ | $H(0.38)$                   | 82.79    | $82.82^{+0.75}_{-0.74}$      |
| $100\theta_{MC}$            | 1.04085  | $1.04086^{+0.00063}_{-0.00062}$ | $\sigma_8$                  | 0.8095   | $0.810^{+0.015}_{-0.015}$       | $D_M(0.38)$                 | 1534.9   | $1534^{+21}_{-20}$           |
| $\tau$                      | 0.0530   | $0.054^{+0.016}_{-0.015}$       | $S_8$                       | 0.8300   | $0.829^{+0.032}_{-0.032}$       | $H(0.51)$                   | 89.55    | $89.57^{+0.60}_{-0.59}$      |
| $\ln(10^{10} A_s)$          | 3.0398   | $3.041^{+0.032}_{-0.032}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4546   | $0.454^{+0.018}_{-0.017}$       | $D_M(0.51)$                 | 1987.7   | $1987^{+24}_{-24}$           |
| $n_s$                       | 0.9656   | $0.9660^{+0.0090}_{-0.0088}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6066   | $0.606^{+0.017}_{-0.016}$       | $H(0.61)$                   | 95.196   | $95.21^{+0.48}_{-0.47}$      |
| $r$                         | 0.0194   | $< 0.0694$                      | $\sigma_8/h^{0.5}$          | 0.9868   | $0.987^{+0.023}_{-0.023}$       | $D_M(0.61)$                 | 2312.5   | $2311^{+26}_{-26}$           |
| $y_{cal}$                   | 1.00054  | $1.0007^{+0.0049}_{-0.0049}$    | $r_{drag} h$                | 99.07    | $99.2^{+2.1}_{-2.1}$            | $H(2.33)$                   | 236.38   | $236.3^{+1.6}_{-1.6}$        |
| $A_{B,dust}$                | 4.60     | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$ | 2.439    | $2.438^{+0.056}_{-0.056}$       | $D_M(2.33)$                 | 5768.3   | $5768^{+22}_{-22}$           |
| $A_{B,sync}$                | 1.49     | $< 3.64$                        | $z_{re}$                    | 7.56     | $7.6^{+1.6}_{-1.6}$             | $f\sigma_8(0.15)$           | 0.4589   | $0.458^{+0.016}_{-0.016}$    |
| $\alpha_{B,dust}$           | -0.50    | —                               | $10^9 A_s$                  | 2.090    | $2.092^{+0.069}_{-0.065}$       | $\sigma_8(0.15)$            | 0.7477   | $0.748^{+0.013}_{-0.013}$    |
| $\beta_{B,dust}$            | 1.580    | $1.60^{+0.19}_{-0.19}$          | $10^9 A_s e^{-2\tau}$       | 1.8801   | $1.880^{+0.023}_{-0.023}$       | $f\sigma_8(0.38)$           | 0.4763   | $0.476^{+0.013}_{-0.013}$    |
| $\alpha_{B,sync}$           | -0.23    | —                               | $D_{40}$                    | 1233.5   | $1237^{+28}_{-27}$              | $\sigma_8(0.38)$            | 0.6623   | $0.663^{+0.011}_{-0.011}$    |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.55}$         | $D_{220}$                   | 5716     | $5716^{+77}_{-77}$              | $f\sigma_8(0.51)$           | 0.4745   | $0.474^{+0.012}_{-0.012}$    |
| $\epsilon_{dust,sync}$      | -0.35    | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                   | 2535.9   | $2536^{+27}_{-27}$              | $\sigma_8(0.51)$            | 0.6196   | $0.620^{+0.010}_{-0.010}$    |
| $A_{100}^{PS}$              | 235.0    | $239^{+50}_{-50}$               | $D_{1420}$                  | 815.9    | $816.1^{+9.7}_{-9.7}$           | $f\sigma_8(0.61)$           | 0.4692   | $0.469^{+0.011}_{-0.011}$    |
| $A_{143}^{PS}$              | 39.6     | $39^{+20}_{-20}$                | $D_{2000}$                  | 230.31   | $230.4^{+3.3}_{-3.3}$           | $\sigma_8(0.61)$            | 0.5895   | $0.5897^{+0.0099}_{-0.0096}$ |
| $A_{217}^{PS}$              | 102.6    | $103^{+30}_{-30}$               | $n_{s,0.002}$               | 0.9656   | $0.9660^{+0.0090}_{-0.0088}$    | $f\sigma_8(2.33)$           | 0.29708  | $0.2972^{+0.0050}_{-0.0048}$ |
| $A_{217}^{CIB}$             | 44.2     | $40^{+10}_{-10}$                | $Y_P$                       | 0.245357 | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$            | 0.3061   | $0.3063^{+0.0053}_{-0.0050}$ |
| $A_{143}^{tSZ}$             | 6.51     | $< 7.47$                        | $Y_P^{BBN}$                 | 0.246684 | $0.24668^{+0.00012}_{-0.00014}$ | $r_{0.002}$                 | 0.0175   | $< 0.0643$                   |
| $r_{143 \times 217}^{PS}$   | 0.601    | $0.66^{+0.25}_{-0.25}$          | $10^5 D/H$                  | 2.603    | $2.604^{+0.060}_{-0.057}$       | $r_{0.01}$                  | 0.0184   | $< 0.0668$                   |
| $r_{143 \times 217}^{CIB}$  | 0.76     | —                               | Age/Gyr                     | 13.8086  | $13.808^{+0.049}_{-0.049}$      | $\ln(10^{10} A_t)$          | -0.90    | $-0.7^{+1.4}_{-1.9}$         |
| $\xi^{tSZ \times CIB}$      | 0.09     | —                               | $z_*$                       | 1090.03  | $1090.02^{+0.57}_{-0.54}$       | $r_{10}$                    | 0.0089   | $< 0.0330$                   |
| $A^{kSZ}$                   | 0.1      | —                               | $r_*$                       | 144.53   | $144.57^{+0.62}_{-0.61}$        | $10^9 A_t$                  | 0.040    | $< 0.145$                    |
| $A_{100}^{dust}$            | 1.004    | $1.00^{+0.38}_{-0.38}$          | $100\theta_*$               | 1.04104  | $1.04105^{+0.00062}_{-0.00061}$ | $10^9 A_t e^{-2\tau}$       | 0.036    | $< 0.131$                    |
| $A_{143}^{dust}$            | 0.972    | $0.96^{+0.35}_{-0.34}$          | $D_M(z_*)/\text{Gpc}$       | 13.883   | $13.887^{+0.058}_{-0.057}$      | $f_{2000}^{143}$            | 30.1     | $30^{+6}_{-6}$               |
| $A_{217}^{dust}$            | 0.971    | $0.98^{+0.20}_{-0.20}$          | $z_{drag}$                  | 1059.70  | $1059.70^{+0.65}_{-0.65}$       | $f_{2000}^{217}$            | 106.92   | $106.9^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | 1.009    | $1.03^{+0.32}_{-0.31}$          | $r_{drag}$                  | 147.23   | $147.26^{+0.62}_{-0.62}$        | $f_{2000}^{143 \times 217}$ | 32.25    | $32^{+4}_{-4}$               |
| $c_{100}$                   | 0.99764  | $0.9975^{+0.0021}_{-0.0021}$    | $k_D$                       | 0.14065  | $0.14062^{+0.00070}_{-0.00070}$ | $\chi_{BKPLANCK}^2$         | 735.45   | $739.9 (\nu: 3.7)$           |
| $c_{217}$                   | 1.00126  | $1.0011^{+0.0030}_{-0.0031}$    | $100\theta_D$               | 0.160882 | $0.16089^{+0.00039}_{-0.00038}$ | $\chi_{small}^2$            | 395.96   | $397.2 (\nu: 1.7)$           |
| $c_{TE}$                    | 0.9966   | $0.9967^{+0.0097}_{-0.0095}$    | $z_{eq}$                    | 3397     | $3394^{+62}_{-61}$              | $\chi_{lowl}^2$             | 23.74    | $24.2 (\nu: 0.7)$            |
| $c_{EE}$                    | 0.9921   | $0.9921^{+0.0097}_{-0.0097}$    | $k_{eq}$                    | 0.010369 | $0.01036^{+0.00019}_{-0.00019}$ | $\chi_{CamSpec}^2$          | 11498.9  | $11513.5 (\nu: 15.6)$        |
| $H_0$                       | 67.29    | $67.3^{+1.2}_{-1.2}$            | $100\theta_{eq}$            | 0.8139   | $0.814^{+0.012}_{-0.011}$       | $\chi_{prior}^2$            | 2.2      | $9.5 (\nu: 7.1)$             |
| $\Omega_\Lambda$            | 0.6846   | $0.685^{+0.016}_{-0.017}$       | $100\theta_{s,eq}$          | 0.4498   | $0.4501^{+0.0060}_{-0.0059}$    | $\chi_{CMB}^2$              | 12654.1  | $12674.8 (\nu: 20.2)$        |
| $\Omega_m$                  | 0.3154   | $0.315^{+0.017}_{-0.016}$       | $H(0.15)$                   | 72.61    | $72.7^{+1.0}_{-1.0}$            |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 12656.30$ ;  $\bar{\chi}_{\text{eff}}^2 = 12684.27$ ;  $R - 1 = 0.00430$

$\chi_{\text{eff}}^2$ : CMB - BK15\_dust: 735.45 small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.96 commander\_dx12\_v3\_2\_29: 23.74 CamSpec like\_10.7HM\_1400\_unified: 11498.91



### 13.22 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022330 | $0.02233^{+0.00029}_{-0.00029}$ | $\Omega_m h^3$              | 0.09609  | $0.09608^{+0.00062}_{-0.00062}$ | $D_M(0.38)$                 | 1528.3   | $1528^{+15}_{-15}$           |
| $\Omega_c h^2$              | 0.11901  | $0.1190^{+0.0020}_{-0.0020}$    | $\sigma_8$                  | 0.8079   | $0.808^{+0.015}_{-0.014}$       | $H(0.51)$                   | 89.727   | $89.73^{+0.46}_{-0.46}$      |
| $100\theta_{MC}$            | 1.04095  | $1.04095^{+0.00058}_{-0.00058}$ | $S_8$                       | 0.8213   | $0.821^{+0.025}_{-0.025}$       | $D_M(0.51)$                 | 1980.1   | $1980^{+18}_{-18}$           |
| $\tau$                      | 0.0548   | $0.055^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4498   | $0.450^{+0.014}_{-0.014}$       | $H(0.61)$                   | 95.333   | $95.33^{+0.38}_{-0.38}$      |
| $\ln(10^{10} A_s)$          | 3.0415   | $3.041^{+0.033}_{-0.032}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6028   | $0.603^{+0.014}_{-0.014}$       | $D_M(0.61)$                 | 2304.3   | $2304^{+19}_{-19}$           |
| $n_s$                       | 0.9681   | $0.9678^{+0.0078}_{-0.0079}$    | $\sigma_8/h^{0.5}$          | 0.9821   | $0.982^{+0.020}_{-0.020}$       | $H(2.33)$                   | 235.87   | $235.9^{+1.2}_{-1.2}$        |
| $r$                         | 0.0213   | $< 0.0713$                      | $r_{drag} h$                | 99.76    | $99.8^{+1.6}_{-1.5}$            | $D_M(2.33)$                 | 5762.7   | $5763^{+18}_{-18}$           |
| $y_{cal}$                   | 1.00068  | $1.0008^{+0.0049}_{-0.0048}$    | $\langle d^2 \rangle^{1/2}$ | 2.4264   | $2.427^{+0.050}_{-0.050}$       | $f\sigma_8(0.15)$           | 0.4545   | $0.454^{+0.013}_{-0.013}$    |
| $A_{B,dust}$                | 4.57     | $4.9^{+2.1}_{-1.9}$             | $z_{re}$                    | 7.72     | $7.7^{+1.6}_{-1.6}$             | $\sigma_8(0.15)$            | 0.7467   | $0.747^{+0.013}_{-0.013}$    |
| $A_{B,sync}$                | 1.40     | $< 3.66$                        | $10^9 A_s$                  | 2.094    | $2.094^{+0.071}_{-0.066}$       | $f\sigma_8(0.38)$           | 0.4731   | $0.473^{+0.011}_{-0.011}$    |
| $\alpha_{B,dust}$           | -0.49    | —                               | $10^9 A_s e^{-2\tau}$       | 1.8765   | $1.877^{+0.022}_{-0.022}$       | $\sigma_8(0.38)$            | 0.6621   | $0.662^{+0.012}_{-0.011}$    |
| $\beta_{B,dust}$            | 1.580    | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                    | 1229.1   | $1234^{+27}_{-26}$              | $f\sigma_8(0.51)$           | 0.4719   | $0.472^{+0.010}_{-0.010}$    |
| $\alpha_{B,sync}$           | -0.35    | —                               | $D_{220}$                   | 5718     | $5720^{+77}_{-75}$              | $\sigma_8(0.51)$            | 0.6197   | $0.620^{+0.011}_{-0.010}$    |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.56}$         | $D_{810}$                   | 2535.9   | $2536^{+27}_{-26}$              | $f\sigma_8(0.61)$           | 0.4671   | $0.4670^{+0.0096}_{-0.0095}$ |
| $\epsilon_{dust,sync}$      | -0.35    | $-0.36^{+0.53}_{-0.57}$         | $D_{1420}$                  | 816.8    | $816.6^{+9.6}_{-9.5}$           | $\sigma_8(0.61)$            | 0.5897   | $0.590^{+0.010}_{-0.0097}$   |
| $A_{100}^{PS}$              | 232.9    | $239^{+50}_{-50}$               | $D_{2000}$                  | 230.66   | $230.6^{+3.2}_{-3.2}$           | $f\sigma_8(2.33)$           | 0.2974   | $0.2973^{+0.0052}_{-0.0049}$ |
| $A_{143}^{PS}$              | 38.7     | $39^{+20}_{-20}$                | $n_{s,0.002}$               | 0.9681   | $0.9678^{+0.0078}_{-0.0079}$    | $\sigma_8(2.33)$            | 0.3066   | $0.3066^{+0.0054}_{-0.0051}$ |
| $A_{217}^{PS}$              | 102.6    | $103^{+30}_{-30}$               | $Y_P$                       | 0.245379 | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.002}$                 | 0.0194   | $< 0.0663$                   |
| $A_{217}^{CIB}$             | 44.1     | $39^{+10}_{-10}$                | $Y_P^{BBN}$                 | 0.246706 | $0.24670^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | 0.0204   | $< 0.0688$                   |
| $A_{143}^{tSZ}$             | 6.61     | $< 7.52$                        | $10^5 D/H$                  | 2.593    | $2.594^{+0.055}_{-0.052}$       | $\ln(10^{10} A_t)$          | -0.81    | $-0.6^{+1.4}_{-1.8}$         |
| $r_{143 \times 217}^{PS}$   | 0.594    | $0.66^{+0.26}_{-0.25}$          | Age/Gyr                     | 13.7965  | $13.797^{+0.042}_{-0.042}$      | $r_{10}$                    | 0.0099   | $< 0.0340$                   |
| $r_{143 \times 217}^{CIB}$  | 0.77     | —                               | $z_*$                       | 1089.883 | $1089.89^{+0.46}_{-0.45}$       | $10^9 A_t$                  | 0.045    | $< 0.149$                    |
| $\xi^{tSZ \times CIB}$      | 0.08     | —                               | $r_*$                       | 144.718  | $144.72^{+0.50}_{-0.48}$        | $10^9 A_t e^{-2\tau}$       | 0.040    | $< 0.134$                    |
| $A^{kSZ}$                   | 0.0      | —                               | $100\theta_*$               | 1.04114  | $1.04114^{+0.00057}_{-0.00058}$ | $f_{2000}^{143}$            | 29.7     | $29^{+6}_{-5}$               |
| $A_{100}^{dust}$            | 1.009    | $1.00^{+0.38}_{-0.39}$          | $D_M(z_*)/\text{Gpc}$       | 13.9000  | $13.900^{+0.047}_{-0.046}$      | $f_{2000}^{217}$            | 106.70   | $106.8^{+3.8}_{-3.8}$        |
| $A_{143}^{dust}$            | 0.968    | $0.96^{+0.34}_{-0.34}$          | $z_{drag}$                  | 1059.78  | $1059.76^{+0.63}_{-0.63}$       | $f_{2000}^{143 \times 217}$ | 31.86    | $32^{+4}_{-4}$               |
| $A_{217}^{dust}$            | 0.972    | $0.98^{+0.20}_{-0.20}$          | $r_{drag}$                  | 147.40   | $147.40^{+0.53}_{-0.51}$        | $\chi_{BKPLANCK}^2$         | 735.72   | $740.2 (\nu: 3.6)$           |
| $A_{143 \times 217}^{dust}$ | 1.004    | $1.03^{+0.32}_{-0.32}$          | $k_D$                       | 0.14051  | $0.14050^{+0.00064}_{-0.00064}$ | $\chi_{small}^2$            | 396.16   | $397.3 (\nu: 1.9)$           |
| $c_{100}$                   | 0.99763  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_D$               | 0.160851 | $0.16086^{+0.00038}_{-0.00037}$ | $\chi_{lowl}^2$             | 23.32    | $23.8 (\nu: 0.6)$            |
| $c_{217}$                   | 1.00128  | $1.0011^{+0.0030}_{-0.0031}$    | $z_{eq}$                    | 3377.6   | $3378^{+46}_{-46}$              | $\chi_{CamSpec}^2$          | 11499.2  | $11513.4 (\nu: 15.5)$        |
| $c_{TE}$                    | 0.9966   | $0.9968^{+0.0098}_{-0.0096}$    | $k_{eq}$                    | 0.010309 | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{6DF}^2$              | 0.022    | $0.048 (\nu: 0.0)$           |
| $c_{EE}$                    | 0.9923   | $0.9924^{+0.0095}_{-0.0096}$    | $100\theta_{eq}$            | 0.8176   | $0.8177^{+0.0087}_{-0.0085}$    | $\chi_{MGS}^2$              | 1.28     | $1.33 (\nu: 0.1)$            |
| $H_0$                       | 67.68    | $67.68^{+0.90}_{-0.89}$         | $100\theta_{s,eq}$          | 0.45167  | $0.4517^{+0.0045}_{-0.0044}$    | $\chi_{DR12BAO}^2$          | 4.23     | $4.6 (\nu: 0.9)$             |
| $\Omega_\Lambda$            | 0.6900   | $0.690^{+0.012}_{-0.012}$       | $H(0.15)$                   | 72.94    | $72.94^{+0.77}_{-0.76}$         | $\chi_{prior}^2$            | 2.3      | $9.5 (\nu: 7.2)$             |
| $\Omega_m$                  | 0.3100   | $0.310^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | 640.7    | $640.7^{+7.6}_{-7.6}$           | $\chi_{BAO}^2$              | 5.54     | $6.0 (\nu: 0.5)$             |
| $\Omega_m h^2$              | 0.14199  | $0.1420^{+0.0019}_{-0.0019}$    | $H(0.38)$                   | 83.03    | $83.02^{+0.57}_{-0.56}$         | $\chi_{CMB}^2$              | 12654.4  | $12674.7 (\nu: 19.9)$        |

Best-fit  $\chi_{\text{eff}}^2 = 12662.21$ ;  $\bar{\chi}_{\text{eff}}^2 = 12690.24$ ;  $R - 1 = 0.00669$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.02 MGS: 1.28 DR12BAO: 4.24 CMB - BK15\_dust: 735.72 small\_100x143\_offlike5\_EE\_Aplanck\_B: 396.17 commander\_dx12\_v3\_2\_29: 23.32 CamSpec like\_10.7HM\_1400\_unified: 11499.19



### 13.23 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022288 | $0.02228^{+0.00031}_{-0.00030}$ | $\Omega_m h^2$              | 0.14281  | $0.1427^{+0.0023}_{-0.0022}$    | $D_M(0.15)$                 | 643.8    | $643.6^{+9.2}_{-9.2}$        |
| $\Omega_c h^2$              | 0.11988  | $0.1198^{+0.0024}_{-0.0024}$    | $\Omega_m h^3$              | 0.09613  | $0.09608^{+0.00062}_{-0.00061}$ | $H(0.38)$                   | 82.81    | $82.82^{+0.68}_{-0.66}$      |
| $100\theta_{MC}$            | 1.04086  | $1.04085^{+0.00061}_{-0.00061}$ | $\sigma_8$                  | 0.8100   | $0.810^{+0.012}_{-0.012}$       | $D_M(0.38)$                 | 1534.5   | $1534^{+18}_{-18}$           |
| $\tau$                      | 0.0534   | $0.054^{+0.015}_{-0.015}$       | $S_8$                       | 0.8303   | $0.830^{+0.025}_{-0.025}$       | $H(0.51)$                   | 89.56    | $89.57^{+0.55}_{-0.53}$      |
| $\ln(10^{10} A_s)$          | 3.0412   | $3.042^{+0.030}_{-0.028}$       | $\sigma_8 \Omega_m^{0.5}$   | 0.4548   | $0.455^{+0.014}_{-0.014}$       | $D_M(0.51)$                 | 1987.3   | $1987^{+21}_{-22}$           |
| $n_s$                       | 0.9657   | $0.9658^{+0.0084}_{-0.0083}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6070   | $0.607^{+0.013}_{-0.013}$       | $H(0.61)$                   | 95.210   | $95.21^{+0.45}_{-0.43}$      |
| $r$                         | 0.0192   | $< 0.0687$                      | $\sigma_8/h^{0.5}$          | 0.9873   | $0.987^{+0.018}_{-0.018}$       | $D_M(0.61)$                 | 2312.0   | $2312^{+23}_{-23}$           |
| $y_{cal}$                   | 1.00074  | $1.0008^{+0.0049}_{-0.0049}$    | $r_{drag} h$                | 99.09    | $99.2^{+1.9}_{-1.8}$            | $H(2.33)$                   | 236.39   | $236.3^{+1.4}_{-1.4}$        |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$ | 2.4397   | $2.440^{+0.043}_{-0.043}$       | $D_M(2.33)$                 | 5767.6   | $5768^{+20}_{-21}$           |
| $A_{B,sync}$                | 1.43     | $< 3.69$                        | $z_{re}$                    | 7.60     | $7.7^{+1.5}_{-1.5}$             | $f\sigma_8(0.15)$           | 0.4591   | $0.459^{+0.013}_{-0.013}$    |
| $\alpha_{B,dust}$           | -0.51    | —                               | $10^9 A_s$                  | 2.093    | $2.096^{+0.063}_{-0.058}$       | $\sigma_8(0.15)$            | 0.7482   | $0.748^{+0.011}_{-0.010}$    |
| $\beta_{B,dust}$            | 1.580    | $1.60^{+0.19}_{-0.19}$          | $10^9 A_s e^{-2\tau}$       | 1.8811   | $1.880^{+0.021}_{-0.021}$       | $f\sigma_8(0.38)$           | 0.4766   | $0.476^{+0.010}_{-0.010}$    |
| $\alpha_{B,sync}$           | -0.35    | —                               | $D_{40}$                    | 1234.0   | $1238^{+27}_{-25}$              | $\sigma_8(0.38)$            | 0.6628   | $0.6630^{+0.0097}_{-0.0093}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.55}$         | $D_{220}$                   | 5720     | $5719^{+77}_{-77}$              | $f\sigma_8(0.51)$           | 0.4747   | $0.4747^{+0.0090}_{-0.0090}$ |
| $\epsilon_{dust,sync}$      | -0.36    | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                   | 2537.4   | $2537^{+26}_{-26}$              | $\sigma_8(0.51)$            | 0.6201   | $0.6203^{+0.0091}_{-0.0087}$ |
| $A_{100}^{PS}$              | 233.7    | $240^{+50}_{-50}$               | $D_{1420}$                  | 816.5    | $816.2^{+9.7}_{-9.7}$           | $f\sigma_8(0.61)$           | 0.4695   | $0.4694^{+0.0082}_{-0.0081}$ |
| $A_{143}^{PS}$              | 42.9     | $40^{+20}_{-20}$                | $D_{2000}$                  | 230.52   | $230.4^{+3.3}_{-3.3}$           | $\sigma_8(0.61)$            | 0.5899   | $0.5902^{+0.0088}_{-0.0083}$ |
| $A_{217}^{PS}$              | 102.9    | $103^{+30}_{-30}$               | $n_{s,0.002}$               | 0.9657   | $0.9658^{+0.0084}_{-0.0083}$    | $f\sigma_8(2.33)$           | 0.29730  | $0.2974^{+0.0046}_{-0.0043}$ |
| $A_{217}^{CIB}$             | 44.0     | $40^{+10}_{-10}$                | $Y_P$                       | 0.245362 | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$            | 0.30634  | $0.3065^{+0.0050}_{-0.0046}$ |
| $A_{143}^{tSZ}$             | 6.56     | $< 7.48$                        | $Y_P^{BBN}$                 | 0.246689 | $0.24668^{+0.00012}_{-0.00013}$ | $r_{0.002}$                 | 0.0173   | $< 0.0634$                   |
| $r_{143 \times 217}^{PS}$   | 0.632    | $0.66^{+0.25}_{-0.25}$          | $10^5 D/H$                  | 2.601    | $2.603^{+0.058}_{-0.057}$       | $r_{0.01}$                  | 0.0182   | $< 0.0661$                   |
| $r_{143 \times 217}^{CIB}$  | 0.82     | —                               | Age/Gyr                     | 13.8069  | $13.808^{+0.046}_{-0.047}$      | $\ln(10^{10} A_t)$          | -0.91    | $-0.7^{+1.4}_{-1.9}$         |
| $\xi^{tSZ \times CIB}$      | 0.29     | —                               | $z_*$                       | 1090.01  | $1090.02^{+0.52}_{-0.52}$       | $r_{10}$                    | 0.0088   | $< 0.0326$                   |
| $A^{kSZ}$                   | 0.0      | —                               | $r_*$                       | 144.53   | $144.56^{+0.55}_{-0.54}$        | $10^9 A_t$                  | 0.040    | $< 0.144$                    |
| $A_{100}^{dust}$            | 1.003    | $1.00^{+0.38}_{-0.38}$          | $100\theta_*$               | 1.04105  | $1.04104^{+0.00060}_{-0.00060}$ | $10^9 A_t e^{-2\tau}$       | 0.036    | $< 0.129$                    |
| $A_{143}^{dust}$            | 0.981    | $0.96^{+0.35}_{-0.34}$          | $D_M(z_*)/\text{Gpc}$       | 13.883   | $13.886^{+0.052}_{-0.051}$      | $f_{2000}^{143}$            | 30.0     | $30^{+6}_{-5}$               |
| $A_{217}^{dust}$            | 0.973    | $0.98^{+0.20}_{-0.20}$          | $z_{drag}$                  | 1059.74  | $1059.71^{+0.64}_{-0.65}$       | $f_{2000}^{217}$            | 106.80   | $106.9^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | 1.001    | $1.03^{+0.32}_{-0.31}$          | $r_{drag}$                  | 147.21   | $147.25^{+0.56}_{-0.56}$        | $f_{2000}^{143 \times 217}$ | 32.13    | $32^{+4}_{-4}$               |
| $c_{100}$                   | 0.99768  | $0.9975^{+0.0021}_{-0.0020}$    | $k_D$                       | 0.14067  | $0.14062^{+0.00066}_{-0.00066}$ | $\chi_{lensing}^2$          | 8.85     | $9.29 (\nu: 0.2)$            |
| $c_{217}$                   | 1.00130  | $1.0011^{+0.0030}_{-0.0030}$    | $100\theta_D$               | 0.160866 | $0.16088^{+0.00038}_{-0.00038}$ | $\chi_{BKPLANCK}^2$         | 735.41   | $739.9 (\nu: 3.5)$           |
| $c_{TE}$                    | 0.9964   | $0.9966^{+0.0097}_{-0.0095}$    | $z_{eq}$                    | 3397     | $3394^{+54}_{-53}$              | $\chi_{small}^2$            | 396.01   | $397.2 (\nu: 1.5)$           |
| $c_{EE}$                    | 0.9919   | $0.9922^{+0.0096}_{-0.0097}$    | $k_{eq}$                    | 0.010369 | $0.01036^{+0.00017}_{-0.00016}$ | $\chi_{lowl}^2$             | 23.74    | $24.2 (\nu: 0.7)$            |
| $H_0$                       | 67.31    | $67.3^{+1.1}_{-1.1}$            | $100\theta_{eq}$            | 0.8139   | $0.814^{+0.010}_{-0.010}$       | $\chi_{CamSpec}^2$          | 11498.9  | $11513.1 (\nu: 15.1)$        |
| $\Omega_\Lambda$            | 0.6848   | $0.685^{+0.015}_{-0.015}$       | $100\theta_{s,eq}$          | 0.4498   | $0.4500^{+0.0052}_{-0.0052}$    | $\chi_{prior}^2$            | 2.3      | $9.4 (\nu: 7.1)$             |
| $\Omega_m$                  | 0.3152   | $0.315^{+0.015}_{-0.015}$       | $H(0.15)$                   | 72.63    | $72.65^{+0.93}_{-0.91}$         | $\chi_{CMB}^2$              | 12662.9  | $12683.6 (\nu: 20.2)$        |

Best-fit  $\chi_{eff}^2 = 12665.14$ ;  $\bar{\chi}_{eff}^2 = 12693.08$ ;  $R - 1 = 0.00549$

$\chi_{eff}^2$ : CMB - smicadx12.Dec5.ftl.mv2.ndclpp.p.teb.consext8: 8.85 BK15.dust: 735.41 small.100x143\_offlike5.EE.Aplanck\_B: 396.01 commander\_dx12.v3.2.29: 23.74 CamSpec like\_10.7HM.1400.unified: 11498.88



### 13.24 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_BAO\_lensing

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022314 | $0.02233^{+0.00029}_{-0.00029}$ | $\sigma_8$                  | 0.8091   | $0.809^{+0.012}_{-0.011}$       | $D_M(0.51)$                 | 1982.5   | $1981^{+17}_{-17}$           |
| $\Omega_c h^2$              | 0.11928  | $0.1191^{+0.0019}_{-0.0019}$    | $S_8$                       | 0.8247   | $0.824^{+0.021}_{-0.020}$       | $H(0.61)$                   | 95.288   | $95.32^{+0.37}_{-0.37}$      |
| $100\theta_{MC}$            | 1.04091  | $1.04094^{+0.00058}_{-0.00058}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4517   | $0.451^{+0.011}_{-0.011}$       | $D_M(0.61)$                 | 2306.9   | $2305^{+18}_{-18}$           |
| $\tau$                      | 0.0547   | $0.056^{+0.015}_{-0.014}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6046   | $0.604^{+0.011}_{-0.011}$       | $H(2.33)$                   | 236.03   | $235.9^{+1.1}_{-1.2}$        |
| $\ln(10^{10} A_s)$          | 3.0431   | $3.045^{+0.030}_{-0.028}$       | $\sigma_8/h^{0.5}$          | 0.9845   | $0.984^{+0.016}_{-0.016}$       | $D_M(2.33)$                 | 5764.5   | $5763^{+18}_{-18}$           |
| $n_s$                       | 0.9670   | $0.9674^{+0.0077}_{-0.0077}$    | $r_{drag} h$                | 99.54    | $99.7^{+1.4}_{-1.4}$            | $f\sigma_8(0.15)$           | 0.4563   | $0.456^{+0.011}_{-0.011}$    |
| $r$                         | 0.0197   | $< 0.0701$                      | $\langle d^2 \rangle^{1/2}$ | 2.4334   | $2.433^{+0.040}_{-0.040}$       | $\sigma_8(0.15)$            | 0.7477   | $0.748^{+0.011}_{-0.010}$    |
| $y_{cal}$                   | 1.00104  | $1.0009^{+0.0048}_{-0.0049}$    | $z_{re}$                    | 7.72     | $7.8^{+1.4}_{-1.4}$             | $f\sigma_8(0.38)$           | 0.4746   | $0.4743^{+0.0090}_{-0.0089}$ |
| $A_{B,dust}$                | 4.62     | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | 2.097    | $2.101^{+0.063}_{-0.058}$       | $\sigma_8(0.38)$            | 0.6627   | $0.6632^{+0.0099}_{-0.0093}$ |
| $A_{B,sync}$                | 1.48     | $< 3.68$                        | $10^9 A_s e^{-2\tau}$       | 1.8796   | $1.878^{+0.020}_{-0.021}$       | $f\sigma_8(0.51)$           | 0.4731   | $0.4730^{+0.0082}_{-0.0081}$ |
| $\alpha_{B,dust}$           | -0.50    | —                               | $D_{40}$                    | 1232.4   | $1236^{+26}_{-25}$              | $\sigma_8(0.51)$            | 0.6202   | $0.6207^{+0.0093}_{-0.0087}$ |
| $\beta_{B,dust}$            | 1.579    | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | 5725     | $5724^{+75}_{-75}$              | $f\sigma_8(0.61)$           | 0.4682   | $0.4681^{+0.0077}_{-0.0076}$ |
| $\alpha_{B,sync}$           | -0.22    | —                               | $D_{810}$                   | 2538.2   | $2537^{+26}_{-26}$              | $\sigma_8(0.61)$            | 0.5901   | $0.5906^{+0.0089}_{-0.0083}$ |
| $\beta_{B,sync}$            | -3.04    | $-3.10^{+0.52}_{-0.56}$         | $D_{1420}$                  | 817.1    | $816.9^{+9.6}_{-9.5}$           | $f\sigma_8(2.33)$           | 0.29754  | $0.2978^{+0.0046}_{-0.0043}$ |
| $\epsilon_{dust,sync}$      | -0.34    | $-0.36^{+0.52}_{-0.57}$         | $D_{2000}$                  | 230.72   | $230.7^{+3.2}_{-3.2}$           | $\sigma_8(2.33)$            | 0.30674  | $0.3071^{+0.0049}_{-0.0045}$ |
| $A_{100}^{PS}$              | 233.6    | $239^{+50}_{-50}$               | $n_{s,0.002}$               | 0.9670   | $0.9674^{+0.0077}_{-0.0077}$    | $r_{0.002}$                 | 0.0179   | $< 0.0651$                   |
| $A_{143}^{PS}$              | 40.5     | $39^{+20}_{-20}$                | $Y_P$                       | 0.245373 | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | 0.0188   | $< 0.0676$                   |
| $A_{217}^{PS}$              | 103.0    | $103^{+30}_{-30}$               | $Y_P^{BBN}$                 | 0.246699 | $0.24670^{+0.00011}_{-0.00012}$ | $\ln(10^{10} A_t)$          | -0.88    | $-0.7^{+1.4}_{-1.9}$         |
| $A_{217}^{CIB}$             | 44.1     | $39^{+10}_{-10}$                | $10^5 D/H$                  | 2.596    | $2.594^{+0.055}_{-0.052}$       | $r_{10}$                    | 0.0091   | $< 0.0334$                   |
| $A_{143}^{tSZ}$             | 6.54     | $< 7.53$                        | Age/Gyr                     | 13.8005  | $13.798^{+0.041}_{-0.041}$      | $10^9 A_t$                  | 0.041    | $< 0.147$                    |
| $r_{143 \times 217}^{PS}$   | 0.609    | $0.66^{+0.26}_{-0.25}$          | $z_*$                       | 1089.927 | $1089.90^{+0.45}_{-0.44}$       | $10^9 A_t e^{-2\tau}$       | 0.037    | $< 0.132$                    |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | $r_*$                       | 144.660  | $144.69^{+0.46}_{-0.45}$        | $f_{2000}^{143}$            | 29.9     | $29^{+6}_{-5}$               |
| $\xi^{tSZ \times CIB}$      | 0.16     | —                               | $100\theta_*$               | 1.04110  | $1.04113^{+0.00058}_{-0.00058}$ | $f_{2000}^{217}$            | 106.89   | $106.8^{+3.8}_{-3.8}$        |
| $A^{kSZ}$                   | 0.0      | —                               | $D_M(z_*)/\text{Gpc}$       | 13.8949  | $13.898^{+0.045}_{-0.043}$      | $f_{2000}^{143 \times 217}$ | 32.05    | $32^{+4}_{-4}$               |
| $A_{100}^{dust}$            | 1.007    | $1.00^{+0.39}_{-0.39}$          | $z_{drag}$                  | 1059.74  | $1059.77^{+0.62}_{-0.64}$       | $\chi_{lensing}^2$          | 8.87     | $9.25 (\nu: 0.2)$            |
| $A_{143}^{dust}$            | 0.972    | $0.96^{+0.35}_{-0.34}$          | $r_{drag}$                  | 147.345  | $147.37^{+0.50}_{-0.48}$        | $\chi_{BKPLANCK}^2$         | 735.58   | $740.0 (\nu: 3.5)$           |
| $A_{217}^{dust}$            | 0.973    | $0.98^{+0.20}_{-0.20}$          | $k_D$                       | 0.14056  | $0.14053^{+0.00062}_{-0.00063}$ | $\chi_{small}^2$            | 396.18   | $397.4 (\nu: 1.9)$           |
| $A_{143 \times 217}^{dust}$ | 1.003    | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | 0.160857 | $0.16085^{+0.00038}_{-0.00037}$ | $\chi_{lowl}^2$             | 23.52    | $24.0 (\nu: 0.6)$            |
| $c_{100}$                   | 0.99766  | $0.9975^{+0.0021}_{-0.0020}$    | $z_{eq}$                    | 3383.7   | $3380^{+42}_{-43}$              | $\chi_{CamSpec}^2$          | 11498.9  | $11512.9 (\nu: 15.0)$        |
| $c_{217}$                   | 1.00128  | $1.0011^{+0.0030}_{-0.0030}$    | $k_{eq}$                    | 0.010327 | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{6DF}^2$              | 0.037    | $0.050 (\nu: 0.0)$           |
| $c_{TE}$                    | 0.9966   | $0.9966^{+0.0098}_{-0.0095}$    | $100\theta_{eq}$            | 0.8165   | $0.8172^{+0.0081}_{-0.0079}$    | $\chi_{MGS}^2$              | 1.16     | $1.28 (\nu: 0.1)$            |
| $c_{EE}$                    | 0.9925   | $0.9924^{+0.0095}_{-0.0096}$    | $100\theta_{s,eq}$          | 0.45107  | $0.4514^{+0.0041}_{-0.0040}$    | $\chi_{DR12BAO}^2$          | 4.60     | $4.7 (\nu: 0.8)$             |
| $H_0$                       | 67.56    | $67.63^{+0.85}_{-0.84}$         | $H(0.15)$                   | 72.84    | $72.90^{+0.73}_{-0.72}$         | $\chi_{prior}^2$            | 2.3      | $9.4 (\nu: 7.2)$             |
| $\Omega_\Lambda$            | 0.6883   | $0.689^{+0.011}_{-0.011}$       | $D_M(0.15)$                 | 641.7    | $641.1^{+7.2}_{-7.2}$           | $\chi_{CMB}^2$              | 12663.0  | $12683.6 (\nu: 20.2)$        |
| $\Omega_m$                  | 0.3117   | $0.311^{+0.011}_{-0.011}$       | $H(0.38)$                   | 82.95    | $83.00^{+0.54}_{-0.54}$         | $\chi_{BAO}^2$              | 5.79     | $6.1 (\nu: 0.5)$             |
| $\Omega_m h^2$              | 0.14224  | $0.1421^{+0.0018}_{-0.0018}$    | $D_M(0.38)$                 | 1530.4   | $1529^{+14}_{-14}$              |                             |          |                              |
| $\Omega_m h^3$              | 0.09609  | $0.09610^{+0.00062}_{-0.00062}$ | $H(0.51)$                   | 89.669   | $89.71^{+0.44}_{-0.44}$         |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12671.15$ ;  $\bar{\chi}_{eff}^2 = 12699.13$ ;  $R - 1 = 0.00878$

$\chi_{eff}^2$ : BAO - 6DF: 0.04 MGS: 1.16 DR12BAO: 4.59 CMB - smicadx12\_Dec5\_ftl\_mv2\_ndclpp\_p\_teb\_consext8: 8.87 BK15\_dust: 735.58 simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.18 commander\_dx12\_v3.2.29: 23.52 CamSpec like\_10.7HM\_1400\_unified: 11498.90



### 13.25 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02228^{+0.00031}_{-0.00031}$ | $\Omega_{\mathrm{m}}h^2$             | $0.1426^{+0.0026}_{-0.0026}$    | $D_{\mathrm{M}}(0.15)$          | $643^{+10}_{-10}$            |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1197^{+0.0027}_{-0.0027}$    | $\Omega_{\mathrm{m}}h^3$             | $0.09608^{+0.00063}_{-0.00062}$ | $H(0.38)$                       | $82.84^{+0.75}_{-0.74}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04086^{+0.00063}_{-0.00062}$ | $\sigma_8$                           | $0.811^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$          | $1534^{+21}_{-20}$           |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $S_8$                                | $0.830^{+0.032}_{-0.031}$       | $H(0.51)$                       | $89.58^{+0.60}_{-0.58}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.043^{+0.028}_{-0.026}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.454^{+0.018}_{-0.017}$       | $D_{\mathrm{M}}(0.51)$          | $1986^{+24}_{-24}$           |
| $n_{\mathrm{s}}$                         | $0.9662^{+0.0090}_{-0.0088}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.016}_{-0.016}$       | $H(0.61)$                       | $95.22^{+0.48}_{-0.47}$      |
| $r$                                      | $< 0.0693$                      | $\sigma_8/h^{0.5}$                   | $0.988^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.61)$          | $2311^{+26}_{-26}$           |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0049}_{-0.0049}$    | $r_{\mathrm{drag}}h$                 | $99.2^{+2.1}_{-2.1}$            | $H(2.33)$                       | $236.3^{+1.6}_{-1.6}$        |
| $A_{B,\mathrm{dust}}$                    | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$          | $2.440^{+0.055}_{-0.053}$       | $D_{\mathrm{M}}(2.33)$          | $5767^{+22}_{-22}$           |
| $A_{B,\mathrm{sync}}$                    | $< 3.65$                        | $z_{\mathrm{re}}$                    | $< 8.94$                        | $f\sigma_8(0.15)$               | $0.459^{+0.016}_{-0.016}$    |
| $\alpha_{B,\mathrm{dust}}$               | —                               | $10^9 A_{\mathrm{s}}$                | $2.098^{+0.060}_{-0.055}$       | $\sigma_8(0.15)$                | $0.749^{+0.012}_{-0.011}$    |
| $\beta_{B,\mathrm{dust}}$                | $1.60^{+0.19}_{-0.19}$          | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.880^{+0.023}_{-0.023}$       | $f\sigma_8(0.38)$               | $0.476^{+0.013}_{-0.013}$    |
| $\alpha_{B,\mathrm{sync}}$               | —                               | $D_{40}$                             | $1237^{+28}_{-27}$              | $\sigma_8(0.38)$                | $0.663^{+0.010}_{-0.0095}$   |
| $\beta_{B,\mathrm{sync}}$                | $-3.10^{+0.52}_{-0.55}$         | $D_{220}$                            | $5716^{+77}_{-77}$              | $f\sigma_8(0.51)$               | $0.475^{+0.012}_{-0.011}$    |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$ | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                            | $2536^{+27}_{-27}$              | $\sigma_8(0.51)$                | $0.6206^{+0.0094}_{-0.0087}$ |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{1420}$                           | $816.1^{+9.7}_{-9.7}$           | $f\sigma_8(0.61)$               | $0.470^{+0.010}_{-0.010}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{2000}$                           | $230.4^{+3.3}_{-3.3}$           | $\sigma_8(0.61)$                | $0.5905^{+0.0088}_{-0.0081}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $n_{\mathrm{s},0.002}$               | $0.9662^{+0.0090}_{-0.0088}$    | $f\sigma_8(2.33)$               | $0.2976^{+0.0044}_{-0.0040}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $Y_{\mathrm{P}}$                     | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$                | $0.3067^{+0.0046}_{-0.0042}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.49$                        | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24668^{+0.00012}_{-0.00013}$ | $r_{0.002}$                     | $< 0.0642$                   |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $10^5 \mathrm{D}/\mathrm{H}$         | $2.603^{+0.059}_{-0.057}$       | $r_{0.01}$                      | $< 0.0667$                   |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.807^{+0.049}_{-0.049}$      | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.7^{+1.4}_{-1.9}$         |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $z_*$                                | $1090.01^{+0.56}_{-0.54}$       | $r_{10}$                        | $< 0.0329$                   |
| $A^{\mathrm{kSZ}}$                       | —                               | $r_*$                                | $144.57^{+0.62}_{-0.61}$        | $10^9 A_{\mathrm{t}}$           | $< 0.145$                    |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.38}_{-0.38}$          | $100\theta_*$                        | $1.04105^{+0.00062}_{-0.00061}$ | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.130$                    |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.887^{+0.058}_{-0.057}$      | $f_{2000}^{143}$                | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $z_{\mathrm{drag}}$                  | $1059.71^{+0.64}_{-0.65}$       | $f_{2000}^{217}$                | $106.8^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $r_{\mathrm{drag}}$                  | $147.27^{+0.62}_{-0.62}$        | $f_{2000}^{143 \times 217}$     | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $k_{\mathrm{D}}$                     | $0.14061^{+0.00070}_{-0.00070}$ | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.9 (\nu: 3.7)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_{\mathrm{D}}$             | $0.16088^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{simall}}^2$      | $397.1 (\nu: 1.7)$           |
| $c_{TE}$                                 | $0.9966^{+0.0097}_{-0.0096}$    | $z_{\mathrm{eq}}$                    | $3393^{+61}_{-61}$              | $\chi_{\mathrm{lowl}}^2$        | $24.2 (\nu: 0.7)$            |
| $c_{EE}$                                 | $0.9921^{+0.0097}_{-0.0097}$    | $k_{\mathrm{eq}}$                    | $0.01036^{+0.00019}_{-0.00019}$ | $\chi_{\mathrm{CamSpec}}^2$     | $11513.4 (\nu: 15.5)$        |
| $H_0$                                    | $67.4^{+1.2}_{-1.2}$            | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.012}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$       | $9.5 (\nu: 7.1)$             |
| $\Omega_{\Lambda}$                       | $0.686^{+0.016}_{-0.017}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4501^{+0.0060}_{-0.0059}$    | $\chi_{\mathrm{CMB}}^2$         | $12674.6 (\nu: 19.8)$        |
| $\Omega_{\mathrm{m}}$                    | $0.314^{+0.017}_{-0.016}$       | $H(0.15)$                            | $72.7^{+1.0}_{-1.0}$            |                                 |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12684.04; R - 1 = 0.00482$$



### 13.26 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_BAO\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02233^{+0.00028}_{-0.00029}$ | $\Omega_m h^3$              | $0.09609^{+0.00063}_{-0.00063}$ | $D_M(0.38)$                 | $1528^{+15}_{-15}$           |
| $\Omega_c h^2$                       | $0.1190^{+0.0020}_{-0.0020}$    | $\sigma_8$                  | $0.809^{+0.013}_{-0.013}$       | $H(0.51)$                   | $89.73^{+0.46}_{-0.46}$      |
| $100\theta_{MC}$                     | $1.04095^{+0.00058}_{-0.00059}$ | $S_8$                       | $0.822^{+0.025}_{-0.024}$       | $D_M(0.51)$                 | $1980^{+18}_{-18}$           |
| $\tau$                               | $0.056^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.013}_{-0.013}$       | $H(0.61)$                   | $95.34^{+0.38}_{-0.38}$      |
| $\ln(10^{10} A_s)$                   | $3.044^{+0.029}_{-0.027}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.013}_{-0.013}$       | $D_M(0.61)$                 | $2304^{+19}_{-20}$           |
| $n_s$                                | $0.9679^{+0.0078}_{-0.0079}$    | $\sigma_8/h^{0.5}$          | $0.983^{+0.020}_{-0.019}$       | $H(2.33)$                   | $235.9^{+1.2}_{-1.3}$        |
| $r$                                  | $< 0.0713$                      | $r_{\text{drag}} h$         | $99.8^{+1.6}_{-1.5}$            | $D_M(2.33)$                 | $5763^{+19}_{-18}$           |
| $y_{\text{cal}}$                     | $1.0008^{+0.0049}_{-0.0049}$    | $\langle d^2 \rangle^{1/2}$ | $2.429^{+0.048}_{-0.046}$       | $f\sigma_8(0.15)$           | $0.455^{+0.013}_{-0.012}$    |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $z_{\text{re}}$             | $< 9.01$                        | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.011}$    |
| $A_{B,\text{sync}}$                  | $< 3.66$                        | $10^9 A_s$                  | $2.098^{+0.062}_{-0.056}$       | $f\sigma_8(0.38)$           | $0.474^{+0.011}_{-0.011}$    |
| $\alpha_{B,\text{dust}}$             | —                               | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.022}_{-0.022}$       | $\sigma_8(0.38)$            | $0.663^{+0.010}_{-0.0095}$   |
| $\beta_{B,\text{dust}}$              | $1.60^{+0.19}_{-0.19}$          | $D_{40}$                    | $1234^{+27}_{-26}$              | $f\sigma_8(0.51)$           | $0.4723^{+0.0099}_{-0.0094}$ |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{220}$                   | $5720^{+77}_{-75}$              | $\sigma_8(0.51)$            | $0.6202^{+0.0095}_{-0.0088}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.56}$         | $D_{810}$                   | $2536^{+27}_{-26}$              | $f\sigma_8(0.61)$           | $0.4675^{+0.0093}_{-0.0087}$ |
| $\epsilon_{\text{dust},\text{sync}}$ | $-0.36^{+0.53}_{-0.57}$         | $D_{1420}$                  | $816.6^{+9.6}_{-9.5}$           | $\sigma_8(0.61)$            | $0.5902^{+0.0090}_{-0.0083}$ |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{2000}$                  | $230.6^{+3.2}_{-3.2}$           | $f\sigma_8(2.33)$           | $0.2976^{+0.0045}_{-0.0042}$ |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $n_{s,0.002}$               | $0.9679^{+0.0078}_{-0.0079}$    | $\sigma_8(2.33)$            | $0.3069^{+0.0047}_{-0.0043}$ |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.002}$                 | $< 0.0663$                   |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $Y_{\text{P}}^{\text{BBN}}$ | $0.24670^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | $< 0.0688$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | $10^5 \text{D}/\text{H}$    | $2.594^{+0.055}_{-0.052}$       | $\ln(10^{10} A_t)$          | $-0.6^{+1.4}_{-1.8}$         |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $\text{Age}/\text{Gyr}$     | $13.797^{+0.042}_{-0.042}$      | $r_{10}$                    | $< 0.0340$                   |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $z_*$                       | $1089.89^{+0.46}_{-0.45}$       | $10^9 A_t$                  | $< 0.150$                    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $r_*$                       | $144.72^{+0.50}_{-0.48}$        | $10^9 A_t e^{-2\tau}$       | $< 0.134$                    |
| $A^{\text{kSZ}}$                     | —                               | $100\theta_*$               | $1.04114^{+0.00058}_{-0.00058}$ | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | $D_M(z_*)/\text{Gpc}$       | $13.901^{+0.048}_{-0.046}$      | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $z_{\text{drag}}$           | $1059.76^{+0.63}_{-0.63}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $r_{\text{drag}}$           | $147.41^{+0.53}_{-0.51}$        | $\chi_{\text{BKPLANCK}}^2$  | $740.1 (\nu: 3.5)$           |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $k_D$                       | $0.14050^{+0.00065}_{-0.00064}$ | $\chi_{\text{simall}}^2$    | $397.3 (\nu: 2.0)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_D$               | $0.16086^{+0.00038}_{-0.00037}$ | $\chi_{\text{lowl}}^2$      | $23.9 (\nu: 0.6)$            |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $z_{\text{eq}}$             | $3377^{+45}_{-46}$              | $\chi_{\text{CamSpec}}^2$   | $11513.3 (\nu: 15.4)$        |
| $c_{TE}$                             | $0.9967^{+0.0098}_{-0.0095}$    | $k_{\text{eq}}$             | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$           |
| $c_{EE}$                             | $0.9923^{+0.0095}_{-0.0096}$    | $100\theta_{\text{eq}}$     | $0.8177^{+0.0087}_{-0.0085}$    | $\chi_{\text{MGS}}^2$       | $1.34 (\nu: 0.1)$            |
| $H_0$                                | $67.68^{+0.90}_{-0.89}$         | $100\theta_{s,\text{eq}}$   | $0.4517^{+0.0045}_{-0.0044}$    | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 0.9)$             |
| $\Omega_\Lambda$                     | $0.690^{+0.012}_{-0.012}$       | $H(0.15)$                   | $72.95^{+0.77}_{-0.76}$         | $\chi_{\text{prior}}^2$     | $9.5 (\nu: 7.2)$             |
| $\Omega_m$                           | $0.310^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | $640.6^{+7.6}_{-7.6}$           | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.5)$             |
| $\Omega_m h^2$                       | $0.1420^{+0.0019}_{-0.0019}$    | $H(0.38)$                   | $83.03^{+0.57}_{-0.56}$         | $\chi_{\text{CMB}}^2$       | $12674.5 (\nu: 19.6)$        |

$$\bar{\chi}_{\text{eff}}^2 = 12690.02; R - 1 = 0.00713$$



### 13.27 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                       | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02228^{+0.00031}_{-0.00030}$ | $\Omega_{\mathrm{m}}h^2$             | $0.1426^{+0.0022}_{-0.0022}$    | $D_{\mathrm{M}}(0.15)$          | $643.4^{+9.0}_{-9.1}$        |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1197^{+0.0023}_{-0.0023}$    | $\Omega_{\mathrm{m}}h^3$             | $0.09608^{+0.00063}_{-0.00062}$ | $H(0.38)$                       | $82.84^{+0.67}_{-0.65}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04086^{+0.00061}_{-0.00061}$ | $\sigma_8$                           | $0.811^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$          | $1534^{+18}_{-18}$           |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $S_8$                                | $0.830^{+0.025}_{-0.025}$       | $H(0.51)$                       | $89.58^{+0.54}_{-0.52}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.044^{+0.026}_{-0.025}$       | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.455^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.51)$          | $1986^{+21}_{-21}$           |
| $n_{\mathrm{s}}$                         | $0.9660^{+0.0084}_{-0.0082}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.013}_{-0.012}$       | $H(0.61)$                       | $95.22^{+0.44}_{-0.42}$      |
| $r$                                      | $< 0.0688$                      | $\sigma_8/h^{0.5}$                   | $0.988^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.61)$          | $2311^{+23}_{-23}$           |
| $y_{\mathrm{cal}}$                       | $1.0008^{+0.0048}_{-0.0049}$    | $r_{\mathrm{drag}}h$                 | $99.2^{+1.9}_{-1.8}$            | $H(2.33)$                       | $236.3^{+1.4}_{-1.4}$        |
| $A_{B,\mathrm{dust}}$                    | $4.9^{+2.1}_{-1.9}$             | $\langle d^2 \rangle^{1/2}$          | $2.441^{+0.043}_{-0.042}$       | $D_{\mathrm{M}}(2.33)$          | $5767^{+20}_{-21}$           |
| $A_{B,\mathrm{sync}}$                    | $< 3.69$                        | $z_{\mathrm{re}}$                    | $< 8.93$                        | $f\sigma_8(0.15)$               | $0.459^{+0.013}_{-0.013}$    |
| $\alpha_{B,\mathrm{dust}}$               | —                               | $10^9 A_{\mathrm{s}}$                | $2.100^{+0.056}_{-0.052}$       | $\sigma_8(0.15)$                | $0.749^{+0.010}_{-0.0093}$   |
| $\beta_{B,\mathrm{dust}}$                | $1.60^{+0.19}_{-0.19}$          | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.880^{+0.021}_{-0.021}$       | $f\sigma_8(0.38)$               | $0.477^{+0.010}_{-0.010}$    |
| $\alpha_{B,\mathrm{sync}}$               | —                               | $D_{40}$                             | $1238^{+26}_{-25}$              | $\sigma_8(0.38)$                | $0.6635^{+0.0088}_{-0.0083}$ |
| $\beta_{B,\mathrm{sync}}$                | $-3.10^{+0.52}_{-0.55}$         | $D_{220}$                            | $5719^{+76}_{-77}$              | $f\sigma_8(0.51)$               | $0.4749^{+0.0089}_{-0.0089}$ |
| $\epsilon_{\mathrm{dust},\mathrm{sync}}$ | $-0.36^{+0.52}_{-0.57}$         | $D_{810}$                            | $2536^{+26}_{-26}$              | $\sigma_8(0.51)$                | $0.6208^{+0.0083}_{-0.0078}$ |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{1420}$                           | $816.2^{+9.7}_{-9.7}$           | $f\sigma_8(0.61)$               | $0.4697^{+0.0081}_{-0.0080}$ |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{2000}$                           | $230.4^{+3.3}_{-3.3}$           | $\sigma_8(0.61)$                | $0.5907^{+0.0079}_{-0.0074}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $n_{\mathrm{s},0.002}$               | $0.9660^{+0.0084}_{-0.0082}$    | $f\sigma_8(2.33)$               | $0.2977^{+0.0041}_{-0.0038}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $Y_{\mathrm{P}}$                     | $0.24536^{+0.00012}_{-0.00013}$ | $\sigma_8(2.33)$                | $0.3068^{+0.0044}_{-0.0041}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00013}$ | $r_{0.002}$                     | $< 0.0635$                   |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $10^5 \mathrm{D}/\mathrm{H}$         | $2.602^{+0.057}_{-0.056}$       | $r_{0.01}$                      | $< 0.0661$                   |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.807^{+0.045}_{-0.046}$      | $\ln(10^{10}A_{\mathrm{t}})$    | $-0.7^{+1.4}_{-1.9}$         |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $z_*$                                | $1090.00^{+0.52}_{-0.51}$       | $r_{10}$                        | $< 0.0326$                   |
| $A^{\mathrm{kSZ}}$                       | —                               | $r_*$                                | $144.57^{+0.54}_{-0.54}$        | $10^9 A_{\mathrm{t}}$           | $< 0.144$                    |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.39}_{-0.38}$          | $100\theta_*$                        | $1.04105^{+0.00060}_{-0.00060}$ | $10^9 A_{\mathrm{t}}e^{-2\tau}$ | $< 0.129$                    |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.887^{+0.051}_{-0.050}$      | $f_{2000}^{143}$                | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $z_{\mathrm{drag}}$                  | $1059.71^{+0.64}_{-0.66}$       | $f_{2000}^{217}$                | $106.9^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $r_{\mathrm{drag}}$                  | $147.27^{+0.56}_{-0.55}$        | $f_{2000}^{143 \times 217}$     | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $k_{\mathrm{D}}$                     | $0.14062^{+0.00066}_{-0.00066}$ | $\chi_{\mathrm{lensing}}^2$     | $9.25 (\nu: 0.2)$            |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0030}$    | $100\theta_{\mathrm{D}}$             | $0.16088^{+0.00038}_{-0.00038}$ | $\chi_{\mathrm{BKPLANCK}}^2$    | $739.8 (\nu: 3.5)$           |
| $c_{TE}$                                 | $0.9966^{+0.0097}_{-0.0095}$    | $z_{\mathrm{eq}}$                    | $3393^{+53}_{-53}$              | $\chi_{\mathrm{simall}}^2$      | $397.1 (\nu: 1.6)$           |
| $c_{EE}$                                 | $0.9921^{+0.0095}_{-0.0097}$    | $k_{\mathrm{eq}}$                    | $0.01036^{+0.00016}_{-0.00016}$ | $\chi_{\mathrm{lowl}}^2$        | $24.2 (\nu: 0.7)$            |
| $H_0$                                    | $67.4^{+1.1}_{-1.0}$            | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.010}_{-0.0099}$      | $\chi_{\mathrm{CamSpec}}^2$     | $11513.0 (\nu: 15.0)$        |
| $\Omega_{\Lambda}$                       | $0.686^{+0.014}_{-0.015}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4502^{+0.0052}_{-0.0051}$    | $\chi_{\mathrm{prior}}^2$       | $9.4 (\nu: 7.1)$             |
| $\Omega_{\mathrm{m}}$                    | $0.314^{+0.015}_{-0.014}$       | $H(0.15)$                            | $72.68^{+0.92}_{-0.88}$         | $\chi_{\mathrm{CMB}}^2$         | $12683.5 (\nu: 20.0)$        |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12692.90; R - 1 = 0.00651$$



### 13.28 base\_r\_CamSpecHM\_TTTEE\_lowl\_lowE\_BK15\_post\_BAO\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02233^{+0.00028}_{-0.00029}$ | $\sigma_8$                  | $0.810^{+0.012}_{-0.011}$       | $D_M(0.51)$                 | $1981^{+17}_{-17}$           |
| $\Omega_c h^2$                       | $0.1191^{+0.0018}_{-0.0019}$    | $S_8$                       | $0.824^{+0.021}_{-0.020}$       | $H(0.61)$                   | $95.32^{+0.37}_{-0.37}$      |
| $100\theta_{MC}$                     | $1.04094^{+0.00058}_{-0.00059}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.451^{+0.011}_{-0.011}$       | $D_M(0.61)$                 | $2305^{+18}_{-18}$           |
| $\tau$                               | $0.057^{+0.013}_{-0.013}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.605^{+0.011}_{-0.011}$       | $H(2.33)$                   | $235.9^{+1.1}_{-1.2}$        |
| $\ln(10^{10} A_s)$                   | $3.046^{+0.027}_{-0.026}$       | $\sigma_8/h^{0.5}$          | $0.985^{+0.016}_{-0.015}$       | $D_M(2.33)$                 | $5763^{+18}_{-18}$           |
| $n_s$                                | $0.9674^{+0.0077}_{-0.0076}$    | $r_{\text{drag}} h$         | $99.7^{+1.4}_{-1.4}$            | $f\sigma_8(0.15)$           | $0.456^{+0.011}_{-0.011}$    |
| $r$                                  | $< 0.0702$                      | $\langle d^2 \rangle^{1/2}$ | $2.434^{+0.040}_{-0.038}$       | $\sigma_8(0.15)$            | $0.748^{+0.010}_{-0.0099}$   |
| $y_{\text{cal}}$                     | $1.0009^{+0.0048}_{-0.0049}$    | $z_{\text{re}}$             | $7.9^{+1.2}_{-1.3}$             | $f\sigma_8(0.38)$           | $0.4745^{+0.0089}_{-0.0088}$ |
| $A_{B,\text{dust}}$                  | $4.9^{+2.1}_{-1.9}$             | $10^9 A_s$                  | $2.103^{+0.057}_{-0.054}$       | $\sigma_8(0.38)$            | $0.6635^{+0.0091}_{-0.0087}$ |
| $A_{B,\text{sync}}$                  | $< 3.68$                        | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.020}_{-0.021}$       | $f\sigma_8(0.51)$           | $0.4732^{+0.0081}_{-0.0079}$ |
| $\alpha_{B,\text{dust}}$             | —                               | $D_{40}$                    | $1236^{+26}_{-25}$              | $\sigma_8(0.51)$            | $0.6210^{+0.0086}_{-0.0081}$ |
| $\beta_{B,\text{dust}}$              | $1.60^{+0.19}_{-0.19}$          | $D_{220}$                   | $5724^{+75}_{-75}$              | $f\sigma_8(0.61)$           | $0.4683^{+0.0076}_{-0.0073}$ |
| $\alpha_{B,\text{sync}}$             | —                               | $D_{810}$                   | $2537^{+26}_{-26}$              | $\sigma_8(0.61)$            | $0.5909^{+0.0082}_{-0.0077}$ |
| $\beta_{B,\text{sync}}$              | $-3.10^{+0.52}_{-0.55}$         | $D_{1420}$                  | $816.8^{+9.6}_{-9.5}$           | $f\sigma_8(2.33)$           | $0.2980^{+0.0042}_{-0.0040}$ |
| $\epsilon_{\text{dust,sync}}$        | $-0.36^{+0.52}_{-0.57}$         | $D_{2000}$                  | $230.7^{+3.2}_{-3.2}$           | $\sigma_8(2.33)$            | $0.3073^{+0.0045}_{-0.0042}$ |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $n_{s,0.002}$               | $0.9674^{+0.0077}_{-0.0076}$    | $r_{0.002}$                 | $< 0.0652$                   |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $r_{0.01}$                  | $< 0.0677$                   |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $Y_P^{\text{BBN}}$          | $0.24670^{+0.00011}_{-0.00012}$ | $\ln(10^{10} A_t)$          | $-0.7^{+1.4}_{-1.9}$         |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $10^5 D/H$                  | $2.594^{+0.055}_{-0.052}$       | $r_{10}$                    | $< 0.0335$                   |
| $A_{143}^{\text{tSZ}}$               | $< 7.55$                        | Age/Gyr                     | $13.797^{+0.041}_{-0.041}$      | $10^9 A_t$                  | $< 0.148$                    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $z_*$                       | $1089.90^{+0.45}_{-0.44}$       | $10^9 A_t e^{-2\tau}$       | $< 0.132$                    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $r_*$                       | $144.70^{+0.46}_{-0.45}$        | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $100\theta_*$               | $1.04113^{+0.00058}_{-0.00058}$ | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $A^{\text{kSZ}}$                     | —                               | $D_M(z_*)/\text{Gpc}$       | $13.898^{+0.045}_{-0.043}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.39}_{-0.39}$          | $z_{\text{drag}}$           | $1059.77^{+0.62}_{-0.64}$       | $\chi_{\text{lensing}}^2$   | $9.21 (\nu: 0.2)$            |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.34}$          | $r_{\text{drag}}$           | $147.38^{+0.49}_{-0.48}$        | $\chi_{\text{BKPLANCK}}^2$  | $740.0 (\nu: 3.5)$           |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $k_D$                       | $0.14053^{+0.00063}_{-0.00063}$ | $\chi_{\text{simall}}^2$    | $397.4 (\nu: 2.0)$           |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $100\theta_D$               | $0.16085^{+0.00038}_{-0.00037}$ | $\chi_{\text{lowl}}^2$      | $24.0 (\nu: 0.6)$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $z_{\text{eq}}$             | $3380^{+42}_{-43}$              | $\chi_{\text{CamSpec}}^2$   | $11512.9 (\nu: 15.0)$        |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $k_{\text{eq}}$             | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{6\text{DF}}^2$       | $0.049 (\nu: 0.0)$           |
| $c_{TE}$                             | $0.9966^{+0.0098}_{-0.0095}$    | $100\theta_{\text{eq}}$     | $0.8173^{+0.0080}_{-0.0078}$    | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$            |
| $c_{EE}$                             | $0.9924^{+0.0095}_{-0.0096}$    | $100\theta_{s,\text{eq}}$   | $0.4515^{+0.0041}_{-0.0040}$    | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 0.8)$             |
| $H_0$                                | $67.64^{+0.84}_{-0.83}$         | $H(0.15)$                   | $72.91^{+0.73}_{-0.72}$         | $\chi_{\text{prior}}^2$     | $9.4 (\nu: 7.2)$             |
| $\Omega_\Lambda$                     | $0.689^{+0.011}_{-0.011}$       | $D_M(0.15)$                 | $641.0^{+7.2}_{-7.1}$           | $\chi_{\text{CMB}}^2$       | $12683.5 (\nu: 20.0)$        |
| $\Omega_m$                           | $0.311^{+0.011}_{-0.011}$       | $H(0.38)$                   | $83.01^{+0.54}_{-0.54}$         | $\chi_{\text{BAO}}^2$       | $6.03 (\nu: 0.5)$            |
| $\Omega_m h^2$                       | $0.1421^{+0.0017}_{-0.0018}$    | $D_M(0.38)$                 | $1529^{+14}_{-14}$              |                             |                              |
| $\Omega_m h^3$                       | $0.09610^{+0.00063}_{-0.00062}$ | $H(0.51)$                   | $89.71^{+0.44}_{-0.44}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12699.00; R - 1 = 0.00924$$



# 14 w

## 14.1 base\_w\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022221 | $0.02217^{+0.00043}_{-0.00043}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4063   | $0.430^{+0.039}_{-0.035}$       | $H(0.15)$                   | 88.7     | $81.6^{+7.9}_{-10}$       |
| $\Omega_c h^2$              | 0.11998  | $0.1202^{+0.0040}_{-0.0040}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6599   | $0.641^{+0.039}_{-0.043}$       | $D_M(0.15)$                 | 481      | $548^{+100}_{-70}$        |
| $100\theta_{MC}$            | 1.04096  | $1.04088^{+0.00093}_{-0.00093}$ | $\sigma_8/h^{0.5}$          | 1.073    | $1.042^{+0.059}_{-0.066}$       | $H(0.38)$                   | 84.46    | $84.1^{+2.1}_{-2.2}$      |
| $\tau$                      | 0.0524   | $0.052^{+0.016}_{-0.016}$       | $r_{drag}h$                 | 146.8    | $125^{+20}_{-30}$               | $D_M(0.38)$                 | 1288     | $1388^{+200}_{-100}$      |
| $w_0$                       | -1.96    | $-1.54^{+0.59}_{-0.48}$         | $\langle d^2 \rangle^{1/2}$ | 2.520    | $2.498^{+0.084}_{-0.094}$       | $H(0.51)$                   | 86.77    | $88.2^{+1.9}_{-2.2}$      |
| $\ln(10^{10} A_s)$          | 3.0381   | $3.039^{+0.032}_{-0.033}$       | $z_{re}$                    | 7.45     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.51)$                 | 1744     | $1841^{+170}_{-120}$      |
| $n_s$                       | 0.9653   | $0.964^{+0.011}_{-0.011}$       | $10^9 A_s$                  | 2.087    | $2.088^{+0.068}_{-0.068}$       | $H(0.61)$                   | 90.19    | $92.5^{+2.8}_{-2.8}$      |
| $y_{cal}$                   | 1.00015  | $1.0004^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | 1.8790   | $1.881^{+0.026}_{-0.026}$       | $D_M(0.61)$                 | 2083     | $2173^{+160}_{-120}$      |
| $A_{100}^{PS}$              | 234.9    | $241^{+50}_{-50}$               | $D_{40}$                    | 1221.3   | $1226^{+29}_{-29}$              | $H(2.33)$                   | 230.35   | $232.3^{+5.4}_{-4.3}$     |
| $A_{143}^{PS}$              | 42.9     | $40^{+20}_{-20}$                | $D_{220}$                   | 5707     | $5707^{+80}_{-81}$              | $D_M(2.33)$                 | 5735.6   | $5748^{+44}_{-44}$        |
| $A_{217}^{PS}$              | 101.3    | $102^{+30}_{-30}$               | $D_{810}$                   | 2532.2   | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.5076   | $0.489^{+0.041}_{-0.040}$ |
| $A_{217}^{CIB}$             | 45.1     | $40^{+10}_{-10}$                | $D_{1420}$                  | 814.0    | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | 1.010    | $0.90^{+0.13}_{-0.16}$    |
| $A_{143}^{tSZ}$             | 6.50     | $< 7.41$                        | $D_{2000}$                  | 229.96   | $229.7^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | 0.644    | $0.570^{+0.094}_{-0.10}$  |
| $r_{143 \times 217}^{PS}$   | 0.610    | $0.65^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9653   | $0.964^{+0.011}_{-0.011}$       | $\sigma_8(0.38)$            | 0.904    | $0.80^{+0.12}_{-0.15}$    |
| $r_{143 \times 217}^{CIB}$  | 0.84     | —                               | $Y_P$                       | 0.245335 | $0.24531^{+0.00017}_{-0.00020}$ | $f\sigma_8(0.51)$           | 0.675    | $0.59^{+0.11}_{-0.12}$    |
| $\xi^{tSZ \times CIB}$      | 0.24     | —                               | $Y_P^{BBN}$                 | 0.246661 | $0.24664^{+0.00017}_{-0.00020}$ | $\sigma_8(0.51)$            | 0.845    | $0.75^{+0.11}_{-0.14}$    |
| $A^{kSZ}$                   | 0.1      | —                               | $10^5 D/H$                  | 2.614    | $2.624^{+0.082}_{-0.080}$       | $f\sigma_8(0.61)$           | 0.681    | $0.59^{+0.11}_{-0.13}$    |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | 13.449   | $13.59^{+0.27}_{-0.19}$         | $\sigma_8(0.61)$            | 0.802    | $0.71^{+0.10}_{-0.13}$    |
| $A_{143}^{dust}$            | 0.991    | $0.97^{+0.34}_{-0.35}$          | $z_*$                       | 1090.11  | $1090.20^{+0.79}_{-0.79}$       | $f\sigma_8(2.33)$           | 0.399    | $0.356^{+0.049}_{-0.063}$ |
| $A_{217}^{dust}$            | 0.967    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.55   | $144.52^{+0.91}_{-0.92}$        | $\sigma_8(2.33)$            | 0.400    | $0.359^{+0.046}_{-0.057}$ |
| $A_{143 \times 217}^{dust}$ | 0.993    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04116  | $1.04108^{+0.00092}_{-0.00091}$ | $f_{2000}^{143}$            | 30.5     | $30^{+6}_{-6}$            |
| $c_{100}$                   | 0.99763  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.884   | $13.882^{+0.084}_{-0.085}$      | $f_{2000}^{217}$            | 107.03   | $107.3^{+4.0}_{-3.9}$     |
| $c_{217}$                   | 1.00138  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.59  | $1059.49^{+0.90}_{-0.89}$       | $f_{2000}^{143 \times 217}$ | 32.41    | $33^{+4}_{-4}$            |
| $H_0$                       | 99.7     | $> 66.5$                        | $r_{drag}$                  | 147.26   | $147.25^{+0.92}_{-0.92}$        | $\chi_{small}^2$            | 395.72   | $396.9 (\nu: 1.4)$        |
| $\Omega_\Lambda$            | 0.856    | $0.790^{+0.071}_{-0.12}$        | $k_D$                       | 0.14057  | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{lowl}^2$             | 22.46    | $23.0 (\nu: 0.6)$         |
| $\Omega_m$                  | 0.144    | $0.210^{+0.12}_{-0.071}$        | $100\theta_D$               | 0.16097  | $0.16103^{+0.00052}_{-0.00051}$ | $\chi_{CamSpec}^2$          | 7048.6   | $7062.0 (\nu: 14.0)$      |
| $\Omega_m h^2$              | 0.14284  | $0.1431^{+0.0038}_{-0.0038}$    | $z_{eq}$                    | 3398     | $3403^{+92}_{-90}$              | $\chi_{prior}^2$            | 2.0      | $7.6 (\nu: 5.8)$          |
| $\Omega_m h^3$              | 0.1424   | $0.121^{+0.023}_{-0.027}$       | $k_{eq}$                    | 0.010371 | $0.01039^{+0.00028}_{-0.00027}$ | $\chi_{CMB}^2$              | 7466.8   | $7481.8 (\nu: 15.0)$      |
| $\sigma_8$                  | 1.072    | $0.96^{+0.13}_{-0.16}$          | $100\theta_{eq}$            | 0.8137   | $0.813^{+0.017}_{-0.017}$       |                             |          |                           |
| $S_8$                       | 0.742    | $0.786^{+0.071}_{-0.064}$       | $100\theta_{s,eq}$          | 0.4497   | $0.4492^{+0.0088}_{-0.0087}$    |                             |          |                           |

Best-fit  $\chi_{eff}^2 = 7468.79$ ;  $\Delta\chi_{eff}^2 = -2.94$ ;  $\bar{\chi}_{eff}^2 = 7489.40$ ;  $\Delta\bar{\chi}_{eff}^2 = -2.14$ ;  $R - 1 = 0.00889$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.72 ( $\Delta$  -0.11) commander\_dx12\_v3\_2\_29: 22.46 ( $\Delta$  -0.94) CamSpec like\_10.7HM: 7048.57 ( $\Delta$  -1.76)



## 14.2 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02222^{+0.00041}_{-0.00042}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.424^{+0.037}_{-0.031}$       | $H(0.15)$                   | $82.2^{+7.6}_{-9.6}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1193^{+0.0032}_{-0.0031}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.635^{+0.028}_{-0.031}$       | $D_{\mathrm{M}}(0.15)$      | $544^{+100}_{-70}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04097^{+0.00090}_{-0.00090}$ | $\sigma_8/h^{0.5}$                    | $1.034^{+0.044}_{-0.050}$       | $H(0.38)$                   | $84.5^{+1.9}_{-2.0}$      |
| $\tau$                                   | $0.052^{+0.016}_{-0.016}$       | $r_{\mathrm{drag}} h$                 | $126^{+20}_{-30}$               | $D_{\mathrm{M}}(0.38)$      | $1378^{+200}_{-100}$      |
| $w_0$                                    | $-1.53^{+0.53}_{-0.44}$         | $\langle d^2 \rangle^{1/2}$           | $2.481^{+0.056}_{-0.061}$       | $H(0.51)$                   | $88.5^{+1.6}_{-1.8}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.035^{+0.031}_{-0.030}$       | $z_{\mathrm{re}}$                     | $7.4^{+1.6}_{-1.7}$             | $D_{\mathrm{M}}(0.51)$      | $1829^{+160}_{-110}$      |
| $n_{\mathrm{s}}$                         | $0.9661^{+0.0099}_{-0.0097}$    | $10^9 A_{\mathrm{s}}$                 | $2.081^{+0.064}_{-0.062}$       | $H(0.61)$                   | $92.7^{+2.5}_{-2.5}$      |
| $y_{\mathrm{cal}}$                       | $1.0003^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.022}_{-0.023}$       | $D_{\mathrm{M}}(0.61)$      | $2161^{+150}_{-110}$      |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{40}$                              | $1221^{+26}_{-26}$              | $H(2.33)$                   | $231.5^{+5.0}_{-3.8}$     |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5709^{+80}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5742^{+41}_{-40}$        |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{810}$                             | $2531^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.482^{+0.029}_{-0.028}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.89^{+0.12}_{-0.14}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.41$                        | $D_{2000}$                            | $229.7^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | $0.563^{+0.079}_{-0.089}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9661^{+0.0099}_{-0.0097}$    | $\sigma_8(0.38)$            | $0.80^{+0.11}_{-0.13}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24533^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.51)$           | $0.580^{+0.094}_{-0.11}$  |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24666^{+0.00017}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.75^{+0.10}_{-0.12}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.615^{+0.080}_{-0.076}$       | $f\sigma_8(0.61)$           | $0.583^{+0.098}_{-0.11}$  |
| $A_{100}^{\mathrm{dust}}$                | $1.02^{+0.38}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.57^{+0.25}_{-0.18}$         | $\sigma_8(0.61)$            | $0.709^{+0.095}_{-0.12}$  |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.05^{+0.72}_{-0.70}$       | $f\sigma_8(2.33)$           | $0.356^{+0.045}_{-0.057}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $144.73^{+0.73}_{-0.74}$        | $\sigma_8(2.33)$            | $0.359^{+0.042}_{-0.052}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04117^{+0.00089}_{-0.00089}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.900^{+0.068}_{-0.068}$      | $f_{2000}^{217}$            | $107.3^{+4.1}_{-4.0}$     |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                   | $1059.53^{+0.90}_{-0.90}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $H_0$                                    | $> 68.2$                        | $r_{\mathrm{drag}}$                   | $147.45^{+0.74}_{-0.74}$        | $\chi_{\mathrm{lensing}}^2$ | $9.0 (\nu: 0.6)$          |
| $\Omega_{\Lambda}$                       | $0.796^{+0.067}_{-0.11}$        | $k_{\mathrm{D}}$                      | $0.14038^{+0.00088}_{-0.00089}$ | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.1)$        |
| $\Omega_{\mathrm{m}}$                    | $0.204^{+0.11}_{-0.067}$        | $100\theta_{\mathrm{D}}$              | $0.16100^{+0.00052}_{-0.00050}$ | $\chi_{\mathrm{lowl}}^2$    | $22.56 (\nu: 0.4)$        |
| $\Omega_{\mathrm{m}} h^2$                | $0.1422^{+0.0030}_{-0.0029}$    | $z_{\mathrm{eq}}$                     | $3382^{+72}_{-69}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7062.1 (\nu: 13.2)$      |
| $\Omega_{\mathrm{m}} h^3$                | $0.121^{+0.022}_{-0.025}$       | $k_{\mathrm{eq}}$                     | $0.01032^{+0.00022}_{-0.00021}$ | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$          |
| $\sigma_8$                               | $0.95^{+0.12}_{-0.14}$          | $100\theta_{\mathrm{eq}}$             | $0.817^{+0.013}_{-0.014}$       | $\chi_{\mathrm{CMB}}^2$     | $7490.4 (\nu: 14.9)$      |
| $S_8$                                    | $0.774^{+0.068}_{-0.057}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4512^{+0.0069}_{-0.0070}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7497.94; \Delta \bar{\chi}_{\mathrm{eff}}^2 = -2.30; R - 1 = 0.01572$$



### 14.3 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02218^{+0.00043}_{-0.00043}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.431^{+0.039}_{-0.035}$       | $H(0.15)$                   | $81.6^{+7.9}_{-10}$       |
| $\Omega_{\mathrm{c}} h^2$                | $0.1201^{+0.0040}_{-0.0039}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.641^{+0.039}_{-0.043}$       | $D_{\mathrm{M}}(0.15)$      | $548^{+100}_{-70}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04089^{+0.00093}_{-0.00092}$ | $\sigma_8/h^{0.5}$                    | $1.043^{+0.059}_{-0.066}$       | $H(0.38)$                   | $84.1^{+2.1}_{-2.2}$      |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $124^{+20}_{-30}$               | $D_{\mathrm{M}}(0.38)$      | $1388^{+200}_{-100}$      |
| $w_0$                                    | $-1.53^{+0.59}_{-0.48}$         | $\langle d^2 \rangle^{1/2}$           | $2.500^{+0.087}_{-0.089}$       | $H(0.51)$                   | $88.3^{+1.8}_{-2.2}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                     | $< 8.84$                        | $D_{\mathrm{M}}(0.51)$      | $1841^{+170}_{-120}$      |
| $n_{\mathrm{s}}$                         | $0.965^{+0.011}_{-0.011}$       | $10^9 A_{\mathrm{s}}$                 | $2.095^{+0.059}_{-0.054}$       | $H(0.61)$                   | $92.6^{+2.8}_{-2.8}$      |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.880^{+0.026}_{-0.026}$       | $D_{\mathrm{M}}(0.61)$      | $2173^{+170}_{-120}$      |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{40}$                              | $1225^{+29}_{-29}$              | $H(2.33)$                   | $232.2^{+5.4}_{-4.4}$     |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5707^{+79}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5748^{+44}_{-44}$        |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.489^{+0.041}_{-0.040}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.90^{+0.13}_{-0.16}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.42$                        | $D_{2000}$                            | $229.8^{+3.6}_{-3.5}$           | $f\sigma_8(0.38)$           | $0.569^{+0.094}_{-0.10}$  |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.965^{+0.011}_{-0.011}$       | $\sigma_8(0.38)$            | $0.80^{+0.12}_{-0.15}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00017}_{-0.00020}$ | $f\sigma_8(0.51)$           | $0.59^{+0.11}_{-0.12}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00017}_{-0.00020}$ | $\sigma_8(0.51)$            | $0.75^{+0.11}_{-0.14}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.622^{+0.082}_{-0.079}$       | $f\sigma_8(0.61)$           | $0.59^{+0.11}_{-0.13}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.59^{+0.27}_{-0.19}$         | $\sigma_8(0.61)$            | $0.71^{+0.10}_{-0.13}$    |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.18^{+0.78}_{-0.79}$       | $f\sigma_8(2.33)$           | $0.356^{+0.049}_{-0.064}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $144.54^{+0.91}_{-0.91}$        | $\sigma_8(2.33)$            | $0.359^{+0.046}_{-0.058}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04109^{+0.00092}_{-0.00091}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.884^{+0.084}_{-0.084}$      | $f_{2000}^{217}$            | $107.3^{+4.0}_{-4.0}$     |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.50^{+0.89}_{-0.90}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $H_0$                                    | $> 66.5$                        | $r_{\mathrm{drag}}$                   | $147.27^{+0.92}_{-0.90}$        | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.3)$        |
| $\Omega_{\Lambda}$                       | $0.790^{+0.071}_{-0.12}$        | $k_{\mathrm{D}}$                      | $0.1405^{+0.0010}_{-0.0010}$    | $\chi_{\mathrm{lowl}}^2$    | $22.9 (\nu: 0.6)$         |
| $\Omega_{\mathrm{m}}$                    | $0.210^{+0.12}_{-0.071}$        | $100\theta_{\mathrm{D}}$              | $0.16102^{+0.00052}_{-0.00051}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7061.9 (\nu: 14.1)$      |
| $\Omega_{\mathrm{m}} h^2$                | $0.1430^{+0.0038}_{-0.0037}$    | $z_{\mathrm{eq}}$                     | $3401^{+91}_{-89}$              | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.7)$          |
| $\Omega_{\mathrm{m}} h^3$                | $0.121^{+0.023}_{-0.027}$       | $k_{\mathrm{eq}}$                     | $0.01038^{+0.00028}_{-0.00027}$ | $\chi_{\mathrm{CMB}}^2$     | $7481.6 (\nu: 14.7)$      |
| $\sigma_8$                               | $0.96^{+0.13}_{-0.16}$          | $100\theta_{\mathrm{eq}}$             | $0.813^{+0.017}_{-0.017}$       |                             |                           |
| $S_8$                                    | $0.787^{+0.071}_{-0.064}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4494^{+0.0087}_{-0.0086}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7489.13; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.13; R - 1 = 0.01149$$



#### 14.4 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02223^{+0.00041}_{-0.00041}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.424^{+0.037}_{-0.032}$       | $H(0.15)$                   | $82.2^{+7.7}_{-9.7}$      |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1191^{+0.0031}_{-0.0030}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.635^{+0.028}_{-0.031}$       | $D_{\mathrm{M}}(0.15)$      | $544^{+100}_{-70}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04099^{+0.00090}_{-0.00090}$ | $\sigma_8/h^{0.5}$                   | $1.034^{+0.044}_{-0.050}$       | $H(0.38)$                   | $84.5^{+1.9}_{-2.1}$      |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $125^{+20}_{-30}$               | $D_{\mathrm{M}}(0.38)$      | $1379^{+200}_{-100}$      |
| $w_0$                                    | $-1.52^{+0.53}_{-0.44}$         | $\langle d^2 \rangle^{1/2}$          | $2.482^{+0.055}_{-0.061}$       | $H(0.51)$                   | $88.6^{+1.5}_{-1.8}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.039^{+0.026}_{-0.023}$       | $z_{\mathrm{re}}$                    | $< 8.74$                        | $D_{\mathrm{M}}(0.51)$      | $1830^{+160}_{-110}$      |
| $n_{\mathrm{s}}$                         | $0.9666^{+0.0096}_{-0.0094}$    | $10^9 A_{\mathrm{s}}$                | $2.088^{+0.054}_{-0.049}$       | $H(0.61)$                   | $92.8^{+2.5}_{-2.5}$      |
| $y_{\mathrm{cal}}$                       | $1.0003^{+0.0048}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.875^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(0.61)$      | $2161^{+150}_{-110}$      |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{40}$                             | $1220^{+26}_{-25}$              | $H(2.33)$                   | $231.5^{+5.1}_{-3.8}$     |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                            | $5709^{+80}_{-81}$              | $D_{\mathrm{M}}(2.33)$      | $5740^{+42}_{-39}$        |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{810}$                            | $2531^{+26}_{-27}$              | $f\sigma_8(0.15)$           | $0.481^{+0.029}_{-0.027}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{1420}$                           | $814^{+10}_{-10}$               | $\sigma_8(0.15)$            | $0.89^{+0.12}_{-0.14}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.41$                        | $D_{2000}$                           | $229.8^{+3.6}_{-3.6}$           | $f\sigma_8(0.38)$           | $0.562^{+0.079}_{-0.089}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9666^{+0.0096}_{-0.0094}$    | $\sigma_8(0.38)$            | $0.80^{+0.11}_{-0.13}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.24534^{+0.00017}_{-0.00018}$ | $f\sigma_8(0.51)$           | $0.579^{+0.094}_{-0.11}$  |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24666^{+0.00017}_{-0.00018}$ | $\sigma_8(0.51)$            | $0.75^{+0.10}_{-0.13}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.612^{+0.080}_{-0.076}$       | $f\sigma_8(0.61)$           | $0.581^{+0.098}_{-0.11}$  |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.57^{+0.25}_{-0.18}$         | $\sigma_8(0.61)$            | $0.708^{+0.096}_{-0.12}$  |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $z_*$                                | $1090.02^{+0.69}_{-0.69}$       | $f\sigma_8(2.33)$           | $0.355^{+0.046}_{-0.058}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                | $144.76^{+0.71}_{-0.71}$        | $\sigma_8(2.33)$            | $0.359^{+0.043}_{-0.052}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04119^{+0.00088}_{-0.00089}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.904^{+0.067}_{-0.067}$      | $f_{2000}^{217}$            | $107.2^{+4.1}_{-4.0}$     |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.55^{+0.88}_{-0.88}$       | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$            |
| $H_0$                                    | $> 67.9$                        | $r_{\mathrm{drag}}$                  | $147.48^{+0.74}_{-0.73}$        | $\chi_{\mathrm{lensing}}^2$ | $9.0 (\nu: 0.6)$          |
| $\Omega_{\Lambda}$                       | $0.795^{+0.067}_{-0.11}$        | $k_{\mathrm{D}}$                     | $0.14035^{+0.00086}_{-0.00090}$ | $\chi_{\mathrm{simall}}^2$  | $396.6 (\nu: 1.0)$        |
| $\Omega_{\mathrm{m}}$                    | $0.205^{+0.11}_{-0.067}$        | $100\theta_{\mathrm{D}}$             | $0.16099^{+0.00053}_{-0.00051}$ | $\chi_{\mathrm{lowl}}^2$    | $22.52 (\nu: 0.4)$        |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1420^{+0.0029}_{-0.0028}$    | $z_{\mathrm{eq}}$                    | $3378^{+69}_{-68}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7062.0 (\nu: 13.3)$      |
| $\Omega_{\mathrm{m}}h^3$                 | $0.121^{+0.022}_{-0.025}$       | $k_{\mathrm{eq}}$                    | $0.01031^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$          |
| $\sigma_8$                               | $0.95^{+0.12}_{-0.14}$          | $100\theta_{\mathrm{eq}}$            | $0.817^{+0.013}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7490.1 (\nu: 14.6)$      |
| $S_8$                                    | $0.775^{+0.068}_{-0.058}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4516^{+0.0067}_{-0.0066}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7497.68; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.33; R - 1 = 0.02078$$



# 14.5 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                            | Best fit | 95% limits                      | Parameter                      | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|--------------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022361 | $0.02233^{+0.00031}_{-0.00030}$ | $\sigma_8$                     | 1.060    | $0.95^{+0.13}_{-0.16}$          | $100\theta_{\text{eq}}$     | 0.8166   | $0.816^{+0.011}_{-0.011}$    |
| $\Omega_c h^2$                       | 0.11924  | $0.1194^{+0.0026}_{-0.0026}$    | $S_8$                          | 0.737    | $0.776^{+0.063}_{-0.055}$       | $100\theta_{\text{s,eq}}$   | 0.4511   | $0.4508^{+0.0058}_{-0.0057}$ |
| $100\theta_{\text{MC}}$              | 1.04093  | $1.04091^{+0.00061}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.5}$      | 0.4035   | $0.425^{+0.035}_{-0.030}$       | $H(0.15)$                   | 88.8     | $82.1^{+7.6}_{-10}$          |
| $\tau$                               | 0.0528   | $0.052^{+0.015}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$     | 0.6540   | $0.635^{+0.033}_{-0.038}$       | $D_{\text{M}}(0.15)$        | 482      | $546^{+100}_{-70}$           |
| $w_0$                                | -1.92    | $-1.52^{+0.56}_{-0.45}$         | $\sigma_8/h^{0.5}$             | 1.065    | $1.034^{+0.051}_{-0.060}$       | $H(0.38)$                   | 84.89    | $84.5^{+1.6}_{-2.0}$         |
| $\ln(10^{10} A_s)$                   | 3.0380   | $3.037^{+0.031}_{-0.032}$       | $r_{\text{drag}} h$            | 146.0    | $125^{+20}_{-30}$               | $D_{\text{M}}(0.38)$        | 1286     | $1381^{+200}_{-100}$         |
| $n_s$                                | 0.9676   | $0.9665^{+0.0085}_{-0.0087}$    | $\langle d^2 \rangle^{1/2}$    | 2.507    | $2.481^{+0.073}_{-0.077}$       | $H(0.51)$                   | 87.21    | $88.6^{+1.5}_{-1.8}$         |
| $y_{\text{cal}}$                     | 1.00017  | $1.0003^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                | 7.45     | $7.4^{+1.5}_{-1.7}$             | $D_{\text{M}}(0.51)$        | 1740     | $1832^{+160}_{-110}$         |
| $A_{100}^{\text{PS}}$                | 230.4    | $238^{+50}_{-50}$               | $10^9 A_s$                     | 2.086    | $2.085^{+0.065}_{-0.066}$       | $H(0.61)$                   | 90.60    | $92.8^{+2.6}_{-2.5}$         |
| $A_{143}^{\text{PS}}$                | 43.8     | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$          | 1.8772   | $1.877^{+0.023}_{-0.023}$       | $D_{\text{M}}(0.61)$        | 2078     | $2163^{+160}_{-110}$         |
| $A_{217}^{\text{PS}}$                | 105.9    | $103^{+30}_{-30}$               | $D_{40}$                       | 1217.6   | $1221^{+25}_{-25}$              | $H(2.33)$                   | 229.95   | $231.8^{+5.1}_{-3.5}$        |
| $A_{217}^{\text{CIB}}$               | 40.9     | $39^{+10}_{-10}$                | $D_{220}$                      | 5719     | $5719^{+73}_{-75}$              | $D_{\text{M}}(2.33)$        | 5727.8   | $5739^{+37}_{-32}$           |
| $A_{143}^{\text{tSZ}}$               | 6.01     | $< 7.54$                        | $D_{810}$                      | 2534.2   | $2534^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.5003   | $0.482^{+0.032}_{-0.035}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.718    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                     | 815.9    | $815.3^{+9.4}_{-9.5}$           | $\sigma_8(0.15)$            | 0.999    | $0.89^{+0.13}_{-0.16}$       |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.69     | —                               | $D_{2000}$                     | 230.76   | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.38)$           | 0.632    | $0.562^{+0.085}_{-0.098}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.53     | —                               | $n_{\text{s},0.002}$           | 0.9676   | $0.9665^{+0.0085}_{-0.0087}$    | $\sigma_8(0.38)$            | 0.895    | $0.80^{+0.11}_{-0.14}$       |
| $A^{\text{kSZ}}$                     | 0.8      | —                               | $Y_{\text{P}}$                 | 0.245392 | $0.24538^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.51)$           | 0.663    | $0.579^{+0.099}_{-0.12}$     |
| $A_{100}^{\text{dust}}$              | 1.001    | $1.01^{+0.38}_{-0.39}$          | $Y_{\text{P}}^{\text{BBN}}$    | 0.246719 | $0.24670^{+0.00012}_{-0.00013}$ | $\sigma_8(0.51)$            | 0.837    | $0.74^{+0.11}_{-0.13}$       |
| $A_{143}^{\text{dust}}$              | 0.943    | $0.96^{+0.35}_{-0.35}$          | $10^5 D/\text{H}$              | 2.587    | $2.593^{+0.058}_{-0.055}$       | $f\sigma_8(0.61)$           | 0.670    | $0.58^{+0.10}_{-0.12}$       |
| $A_{217}^{\text{dust}}$              | 0.977    | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$        | 13.437   | $13.57^{+0.25}_{-0.17}$         | $\sigma_8(0.61)$            | 0.794    | $0.71^{+0.10}_{-0.13}$       |
| $A_{143 \times 217}^{\text{dust}}$   | 1.037    | $1.03^{+0.32}_{-0.32}$          | $z_*$                          | 1089.86  | $1089.92^{+0.54}_{-0.53}$       | $f\sigma_8(2.33)$           | 0.396    | $0.355^{+0.048}_{-0.062}$    |
| $c_{100}$                            | 0.99782  | $0.9975^{+0.0021}_{-0.0021}$    | $r_*$                          | 144.63   | $144.62^{+0.60}_{-0.60}$        | $\sigma_8(2.33)$            | 0.397    | $0.358^{+0.044}_{-0.056}$    |
| $c_{217}$                            | 1.00110  | $1.0011^{+0.0031}_{-0.0031}$    | $100\theta_*$                  | 1.04111  | $1.04110^{+0.00060}_{-0.00061}$ | $f_{2000}^{143}$            | 28.9     | $29^{+6}_{-5}$               |
| $c_{TE}$                             | 0.9959   | $0.9958^{+0.0098}_{-0.0096}$    | $D_{\text{M}}(z_*)/\text{Gpc}$ | 13.892   | $13.891^{+0.056}_{-0.056}$      | $f_{2000}^{217}$            | 105.98   | $106.6^{+3.8}_{-3.8}$        |
| $c_{EE}$                             | 0.9919   | $0.9917^{+0.0096}_{-0.0097}$    | $z_{\text{drag}}$              | 1059.86  | $1059.81^{+0.62}_{-0.64}$       | $f_{2000}^{143 \times 217}$ | 31.53    | $32^{+4}_{-4}$               |
| $H_0$                                | 99.1     | $> 67.2$                        | $r_{\text{drag}}$              | 147.30   | $147.29^{+0.62}_{-0.61}$        | $\chi_{\text{small}}^2$     | 395.73   | $396.7 (\nu: 1.1)$           |
| $\Omega_{\Lambda}$                   | 0.855    | $0.793^{+0.068}_{-0.11}$        | $k_{\text{D}}$                 | 0.14064  | $0.14062^{+0.00068}_{-0.00070}$ | $\chi_{\text{lowl}}^2$      | 22.18    | $22.57 (\nu: 0.3)$           |
| $\Omega_{\text{m}}$                  | 0.145    | $0.207^{+0.11}_{-0.068}$        | $100\theta_{\text{D}}$         | 0.160796 | $0.16083^{+0.00037}_{-0.00037}$ | $\chi_{\text{CamSpec}}^2$   | 11498.2  | $11513.3 (\nu: 15.6)$        |
| $\Omega_{\text{m}} h^2$              | 0.14224  | $0.1424^{+0.0025}_{-0.0025}$    | $z_{\text{eq}}$                | 3384     | $3387^{+60}_{-59}$              | $\chi_{\text{prior}}^2$     | 1.9      | $7.8 (\nu: 5.8)$             |
| $\Omega_{\text{m}} h^3$              | 0.1409   | $0.121^{+0.022}_{-0.026}$       | $k_{\text{eq}}$                | 0.010328 | $0.01034^{+0.00018}_{-0.00018}$ | $\chi_{\text{CMB}}^2$       | 11916.1  | $11932.6 (\nu: 16.5)$        |

Best-fit  $\chi_{\text{eff}}^2 = 11918.08$ ;  $\Delta\chi_{\text{eff}}^2 = -2.68$ ;  $\bar{\chi}_{\text{eff}}^2 = 11940.42$ ;  $\Delta\bar{\chi}_{\text{eff}}^2 = -2.04$ ;  $R - 1 = 0.01476$

$\chi_{\text{eff}}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.73 ( $\Delta$  -0.16) commander\_dx12\_v3\_2\_29: 22.18 ( $\Delta$  -0.83) CamSpec like\_10.7HM\_1400\_unified: 11498.24 ( $\Delta$  -1.41)



## 14.6 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02235^{+0.00030}_{-0.00030}$ | $S_8$                       | $0.770^{+0.062}_{-0.051}$       | $H(0.15)$                   | $82.6^{+7.2}_{-9.3}$      |
| $\Omega_c h^2$                       | $0.1191^{+0.0024}_{-0.0023}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.422^{+0.034}_{-0.028}$       | $D_M(0.15)$                 | $541^{+90}_{-70}$         |
| $100\theta_{MC}$                     | $1.04093^{+0.00061}_{-0.00060}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.634^{+0.026}_{-0.030}$       | $H(0.38)$                   | $84.7^{+1.5}_{-1.8}$      |
| $\tau$                               | $0.052^{+0.014}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $1.032^{+0.041}_{-0.048}$       | $D_M(0.38)$                 | $1372^{+150}_{-100}$      |
| $w_0$                                | $-1.54^{+0.51}_{-0.41}$         | $r_{\text{drag}} h$         | $126^{+20}_{-30}$               | $H(0.51)$                   | $88.7^{+1.4}_{-1.6}$      |
| $\ln(10^{10} A_s)$                   | $3.035^{+0.028}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$ | $2.476^{+0.051}_{-0.058}$       | $D_M(0.51)$                 | $1823^{+150}_{-100}$      |
| $n_s$                                | $0.9671^{+0.0080}_{-0.0082}$    | $z_{\text{re}}$             | $7.3^{+1.5}_{-1.5}$             | $H(0.61)$                   | $92.8^{+2.5}_{-2.4}$      |
| $y_{\text{cal}}$                     | $1.0002^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.080^{+0.059}_{-0.060}$       | $D_M(0.61)$                 | $2154^{+140}_{-98}$       |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.021}_{-0.021}$       | $H(2.33)$                   | $231.4^{+4.5}_{-3.2}$     |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1219^{+24}_{-23}$              | $D_M(2.33)$                 | $5735^{+33}_{-30}$        |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{220}$                   | $5719^{+72}_{-75}$              | $f\sigma_8(0.15)$           | $0.480^{+0.025}_{-0.027}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2532^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.89^{+0.11}_{-0.14}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.58$                        | $D_{1420}$                  | $815.1^{+9.4}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.563^{+0.075}_{-0.087}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $D_{2000}$                  | $230.3^{+3.1}_{-3.1}$           | $\sigma_8(0.38)$            | $0.80^{+0.10}_{-0.13}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9671^{+0.0080}_{-0.0082}$    | $f\sigma_8(0.51)$           | $0.580^{+0.089}_{-0.10}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24538^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.747^{+0.097}_{-0.12}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.583^{+0.093}_{-0.11}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.40}$          | $10^5 D/H$                  | $2.590^{+0.057}_{-0.055}$       | $\sigma_8(0.61)$            | $0.710^{+0.091}_{-0.11}$  |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $\text{Age/Gyr}$            | $13.56^{+0.23}_{-0.16}$         | $f\sigma_8(2.33)$           | $0.356^{+0.043}_{-0.056}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.87^{+0.52}_{-0.50}$       | $\sigma_8(2.33)$            | $0.359^{+0.040}_{-0.051}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.68^{+0.53}_{-0.54}$        | $f_{2000}^{143}$            | $29^{+6}_{-5}$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | $1.04112^{+0.00060}_{-0.00059}$ | $f_{2000}^{217}$            | $106.6^{+3.8}_{-3.8}$     |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.897^{+0.050}_{-0.050}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{TE}$                             | $0.9960^{+0.0097}_{-0.0097}$    | $z_{\text{drag}}$           | $1059.82^{+0.65}_{-0.65}$       | $\chi_{\text{lensing}}^2$   | $8.75 (\nu: 0.3)$         |
| $c_{EE}$                             | $0.9918^{+0.0094}_{-0.0099}$    | $r_{\text{drag}}$           | $147.36^{+0.55}_{-0.55}$        | $\chi_{\text{simall}}^2$    | $396.6 (\nu: 0.8)$        |
| $H_0$                                | $> 69.1$                        | $k_D$                       | $0.14057^{+0.00063}_{-0.00066}$ | $\chi_{\text{lowl}}^2$      | $22.42 (\nu: 0.3)$        |
| $\Omega_\Lambda$                     | $0.799^{+0.063}_{-0.10}$        | $100\theta_D$               | $0.16082^{+0.00037}_{-0.00037}$ | $\chi_{\text{CamSpec}}^2$   | $11513.1 (\nu: 14.8)$     |
| $\Omega_m$                           | $0.201^{+0.10}_{-0.063}$        | $z_{\text{eq}}$             | $3380^{+54}_{-52}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$          |
| $\Omega_m h^2$                       | $0.1421^{+0.0023}_{-0.0022}$    | $k_{\text{eq}}$             | $0.01032^{+0.00016}_{-0.00016}$ | $\chi_{\text{CMB}}^2$       | $11940.9 (\nu: 16.6)$     |
| $\Omega_m h^3$                       | $0.122^{+0.021}_{-0.024}$       | $100\theta_{\text{eq}}$     | $0.817^{+0.010}_{-0.010}$       |                             |                           |
| $\sigma_8$                           | $0.95^{+0.11}_{-0.14}$          | $100\theta_{s,\text{eq}}$   | $0.4515^{+0.0051}_{-0.0052}$    |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11948.65; \Delta\bar{\chi}_{\text{eff}}^2 = -2.80; R - 1 = 0.02333$$



## 14.7 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02232^{+0.00028}_{-0.00029}$ | $S_8$                       | $0.809^{+0.029}_{-0.030}$       | $H(0.15)$                   | $76.4^{+1.9}_{-1.9}$      |
| $\Omega_c h^2$                       | $0.1196^{+0.0029}_{-0.0028}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.443^{+0.016}_{-0.017}$       | $D_M(0.15)$                 | $601^{+21}_{-20}$         |
| $100\theta_{MC}$                     | $1.04089^{+0.00062}_{-0.00062}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.619^{+0.021}_{-0.021}$       | $H(0.38)$                   | $83.85^{+0.77}_{-0.81}$   |
| $\tau$                               | $0.052^{+0.015}_{-0.014}$       | $\sigma_8/h^{0.5}$          | $1.007^{+0.030}_{-0.030}$       | $D_M(0.38)$                 | $1466^{+34}_{-33}$        |
| $w_0$                                | $-1.20^{+0.11}_{-0.12}$         | $r_{\text{drag}} h$         | $108.3^{+4.9}_{-4.8}$           | $H(0.51)$                   | $89.56^{+0.70}_{-0.75}$   |
| $\ln(10^{10} A_s)$                   | $3.038^{+0.030}_{-0.030}$       | $\langle d^2 \rangle^{1/2}$ | $2.460^{+0.061}_{-0.064}$       | $D_M(0.51)$                 | $1916^{+36}_{-34}$        |
| $n_s$                                | $0.9659^{+0.0081}_{-0.0084}$    | $z_{\text{re}}$             | $7.4^{+1.4}_{-1.6}$             | $H(0.61)$                   | $94.59^{+0.79}_{-0.83}$   |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0047}$    | $10^9 A_s$                  | $2.086^{+0.063}_{-0.063}$       | $D_M(0.61)$                 | $2242^{+36}_{-34}$        |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.023}_{-0.022}$       | $H(2.33)$                   | $233.8^{+1.7}_{-1.8}$     |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1225^{+24}_{-26}$              | $D_M(2.33)$                 | $5749^{+20}_{-20}$        |
| $A_{217}^{\text{PS}}$                | $103^{+20}_{-30}$               | $D_{220}$                   | $5721^{+71}_{-76}$              | $f\sigma_8(0.15)$           | $0.467^{+0.021}_{-0.021}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.802^{+0.036}_{-0.034}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.62$                        | $D_{1420}$                  | $815.8^{+9.7}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.507^{+0.027}_{-0.027}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.24}$          | $D_{2000}$                  | $230.4^{+3.2}_{-2.9}$           | $\sigma_8(0.38)$            | $0.713^{+0.032}_{-0.031}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9659^{+0.0081}_{-0.0084}$    | $f\sigma_8(0.51)$           | $0.512^{+0.030}_{-0.028}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24537^{+0.00011}_{-0.00011}$ | $\sigma_8(0.51)$            | $0.667^{+0.030}_{-0.029}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24670^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.509^{+0.030}_{-0.028}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.36}_{-0.38}$          | $10^5 \text{D/H}$           | $2.596^{+0.055}_{-0.050}$       | $\sigma_8(0.61)$            | $0.634^{+0.028}_{-0.027}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.36}_{-0.33}$          | $\text{Age/Gyr}$            | $13.693^{+0.062}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.320^{+0.014}_{-0.013}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.96^{+0.50}_{-0.51}$       | $\sigma_8(2.33)$            | $0.326^{+0.012}_{-0.012}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.57^{+0.64}_{-0.66}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$               | $1.04108^{+0.00062}_{-0.00062}$ | $f_{2000}^{217}$            | $106.8^{+3.9}_{-3.7}$     |
| $c_{217}$                            | $1.0011^{+0.0030}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.887^{+0.060}_{-0.059}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{TE}$                             | $0.9961^{+0.0097}_{-0.010}$     | $z_{\text{drag}}$           | $1059.78^{+0.61}_{-0.61}$       | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 0.9)$        |
| $c_{EE}$                             | $0.9918^{+0.0094}_{-0.010}$     | $r_{\text{drag}}$           | $147.25^{+0.67}_{-0.66}$        | $\chi_{\text{lowl}}^2$      | $22.85 (\nu: 0.4)$        |
| $H_0$                                | $73.5^{+3.3}_{-3.2}$            | $k_D$                       | $0.14066^{+0.00075}_{-0.00073}$ | $\chi_{\text{CamSpec}}^2$   | $11513.7 (\nu: 14.2)$     |
| $\Omega_\Lambda$                     | $0.736^{+0.023}_{-0.025}$       | $100\theta_D$               | $0.16084^{+0.00036}_{-0.00033}$ | $\chi_{\text{H073p45}}^2$   | $1.0 (\nu: 1.0)$          |
| $\Omega_m$                           | $0.264^{+0.025}_{-0.023}$       | $z_{\text{eq}}$             | $3392^{+62}_{-63}$              | $\chi_{\text{prior}}^2$     | $7.7 (\nu: 5.9)$          |
| $\Omega_m h^2$                       | $0.1426^{+0.0026}_{-0.0026}$    | $k_{\text{eq}}$             | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{\text{CMB}}^2$       | $11933.2 (\nu: 15.1)$     |
| $\Omega_m h^3$                       | $0.1049^{+0.0051}_{-0.0048}$    | $100\theta_{\text{eq}}$     | $0.815^{+0.012}_{-0.012}$       |                             |                           |
| $\sigma_8$                           | $0.863^{+0.038}_{-0.035}$       | $100\theta_{s,\text{eq}}$   | $0.4503^{+0.0061}_{-0.0061}$    |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11941.94; \Delta\bar{\chi}_{\text{eff}}^2 = -12.32; R - 1 = 0.08175$$



## 14.8 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter  | 95% limits                      | Parameter                           | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|-------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$   | $0.02234^{+0.00030}_{-0.00030}$ | $\sigma_8$                          | $0.95^{+0.13}_{-0.16}$          | $100\theta_{\text{eq}}$     | $0.816^{+0.011}_{-0.011}$    |
| $\Omega_c h^2$   | $0.1194^{+0.0026}_{-0.0026}$    | $S_8$                               | $0.777^{+0.062}_{-0.054}$       | $100\theta_{\text{s,eq}}$   | $0.4509^{+0.0058}_{-0.0057}$ |
| $100\theta_{\text{MC}}$  | $1.04092^{+0.00061}_{-0.00061}$ | $\sigma_8 \Omega_{\text{m}}^{0.5}$  | $0.426^{+0.034}_{-0.030}$       | $H(0.15)$                   | $82.0^{+7.7}_{-10}$          |
| $\tau$   | $0.054^{+0.012}_{-0.011}$       | $\sigma_8 \Omega_{\text{m}}^{0.25}$ | $0.636^{+0.033}_{-0.038}$       | $D_{\text{M}}(0.15)$        | $546^{+100}_{-70}$           |
| $w_0$  | $-1.52^{+0.57}_{-0.45}$         | $\sigma_8/h^{0.5}$                  | $1.035^{+0.051}_{-0.060}$       | $H(0.38)$                   | $84.5^{+1.6}_{-2.0}$         |
| $\ln(10^{10} A_{\text{s}})$  | $3.040^{+0.026}_{-0.024}$       | $r_{\text{drag}} h$                 | $125^{+20}_{-30}$               | $D_{\text{M}}(0.38)$        | $1381^{+200}_{-100}$         |
| $n_{\text{s}}$   | $0.9667^{+0.0084}_{-0.0087}$    | $\langle d^2 \rangle^{1/2}$         | $2.484^{+0.072}_{-0.076}$       | $H(0.51)$                   | $88.6^{+1.5}_{-1.8}$         |
| $y_{\text{cal}}$   | $1.0003^{+0.0049}_{-0.0049}$    | $z_{\text{re}}$                     | $< 8.70$                        | $D_{\text{M}}(0.51)$        | $1833^{+160}_{-110}$         |
| $A_{100}^{\text{PS}}$  | $238^{+50}_{-50}$               | $10^9 A_{\text{s}}$                 | $2.092^{+0.055}_{-0.050}$       | $H(0.61)$                   | $92.8^{+2.6}_{-2.5}$         |
| $A_{143}^{\text{PS}}$  | $39^{+20}_{-20}$                | $10^9 A_{\text{s}} e^{-2\tau}$      | $1.877^{+0.023}_{-0.023}$       | $D_{\text{M}}(0.61)$        | $2164^{+160}_{-110}$         |
| $A_{217}^{\text{PS}}$  | $103^{+30}_{-30}$               | $D_{40}$                            | $1221^{+25}_{-25}$              | $H(2.33)$                   | $231.8^{+5.1}_{-3.5}$        |
| $A_{217}^{\text{CIB}}$   | $39^{+10}_{-10}$                | $D_{220}$                           | $5719^{+72}_{-76}$              | $D_{\text{M}}(2.33)$        | $5738^{+37}_{-32}$           |
| $A_{143}^{\text{tSZ}}$   | $< 7.53$                        | $D_{810}$                           | $2533^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.482^{+0.032}_{-0.035}$    |
| $r_{143 \times 217}^{\text{PS}}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                          | $815.3^{+9.5}_{-9.6}$           | $\sigma_8(0.15)$            | $0.89^{+0.13}_{-0.16}$       |
| $r_{143 \times 217}^{\text{CIB}}$  | —                               | $D_{2000}$                          | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.38)$           | $0.563^{+0.085}_{-0.098}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$   | —                               | $n_{\text{s},0.002}$                | $0.9667^{+0.0084}_{-0.0087}$    | $\sigma_8(0.38)$            | $0.80^{+0.12}_{-0.15}$       |
| $A^{\text{kSZ}}$   | —                               | $Y_{\text{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.51)$           | $0.58^{+0.10}_{-0.12}$       |
| $A_{100}^{\text{dust}}$  | $1.01^{+0.38}_{-0.39}$          | $Y_{\text{P}}^{\text{BBN}}$         | $0.24671^{+0.00012}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.74^{+0.11}_{-0.14}$       |
| $A_{143}^{\text{dust}}$  | $0.96^{+0.34}_{-0.35}$          | $10^5 \text{D}/\text{H}$            | $2.592^{+0.057}_{-0.055}$       | $f\sigma_8(0.61)$           | $0.58^{+0.10}_{-0.12}$       |
| $A_{217}^{\text{dust}}$  | $0.98^{+0.20}_{-0.20}$          | $\text{Age}/\text{Gyr}$             | $13.57^{+0.25}_{-0.17}$         | $\sigma_8(0.61)$            | $0.71^{+0.10}_{-0.13}$       |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $z_*$                               | $1089.91^{+0.53}_{-0.53}$       | $f\sigma_8(2.33)$           | $0.355^{+0.048}_{-0.062}$    |
| $c_{100}$  | $0.9975^{+0.0020}_{-0.0021}$    | $r_*$                               | $144.62^{+0.61}_{-0.59}$        | $\sigma_8(2.33)$            | $0.358^{+0.044}_{-0.056}$    |
| $c_{217}$  | $1.0010^{+0.0032}_{-0.0031}$    | $100\theta_*$                       | $1.04111^{+0.00060}_{-0.00060}$ | $f_{2000}^{143}$            | $29^{+6}_{-5}$               |
| $c_{TE}$   | $0.9957^{+0.0098}_{-0.0096}$    | $D_{\text{M}}(z_*)/\text{Gpc}$      | $13.891^{+0.057}_{-0.055}$      | $f_{2000}^{217}$            | $106.5^{+3.8}_{-3.8}$        |
| $c_{EE}$   | $0.9916^{+0.0097}_{-0.0097}$    | $z_{\text{drag}}$                   | $1059.82^{+0.65}_{-0.65}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $H_0$  | $> 67.0$                        | $r_{\text{drag}}$                   | $147.30^{+0.61}_{-0.60}$        | $\chi_{\text{simall}}^2$    | $396.6 (\nu: 1.0)$           |
| $\Omega_{\Lambda}$   | $0.793^{+0.069}_{-0.11}$        | $k_{\text{D}}$                      | $0.14063^{+0.00068}_{-0.00070}$ | $\chi_{\text{lowl}}^2$      | $22.57 (\nu: 0.3)$           |
| $\Omega_{\text{m}}$  | $0.207^{+0.11}_{-0.069}$        | $100\theta_{\text{D}}$              | $0.16082^{+0.00037}_{-0.00037}$ | $\chi_{\text{CamSpec}}^2$   | $11513.1 (\nu: 15.4)$        |
| $\Omega_{\text{m}} h^2$  | $0.1423^{+0.0025}_{-0.0025}$    | $z_{\text{eq}}$                     | $3386^{+59}_{-60}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_{\text{m}} h^3$  | $0.121^{+0.022}_{-0.027}$       | $k_{\text{eq}}$                     | $0.01034^{+0.00018}_{-0.00018}$ | $\chi_{\text{CMB}}^2$       | $11932.3 (\nu: 16.0)$        |
| $\bar{\chi}_{\text{eff}}^2 = 11940.09; \Delta\bar{\chi}_{\text{eff}}^2 = -2.09; R - 1 = 0.01385$ |                                 |                                     |                                 |                             |                              |



# 14.9 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_b h^2$                       | $0.02236^{+0.00031}_{-0.00029}$ | $S_8$                       | $0.771^{+0.061}_{-0.051}$       | $H(0.15)$                   | $82.5^{+7.3}_{-9.4}$      |
| $\Omega_c h^2$                       | $0.1190^{+0.0023}_{-0.0023}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.422^{+0.034}_{-0.028}$       | $D_M(0.15)$                 | $542^{+90}_{-70}$         |
| $100\theta_{MC}$                     | $1.04095^{+0.00060}_{-0.00058}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.634^{+0.026}_{-0.030}$       | $H(0.38)$                   | $84.7^{+1.5}_{-1.8}$      |
| $\tau$                               | $0.0534^{+0.011}_{-0.0099}$     | $\sigma_8/h^{0.5}$          | $1.032^{+0.041}_{-0.049}$       | $D_M(0.38)$                 | $1374^{+150}_{-100}$      |
| $w_0$                                | $-1.53^{+0.51}_{-0.42}$         | $r_{\text{drag}} h$         | $126^{+20}_{-30}$               | $H(0.51)$                   | $88.7^{+1.4}_{-1.6}$      |
| $\ln(10^{10} A_s)$                   | $3.038^{+0.024}_{-0.022}$       | $\langle d^2 \rangle^{1/2}$ | $2.478^{+0.052}_{-0.055}$       | $D_M(0.51)$                 | $1824^{+150}_{-100}$      |
| $n_s$                                | $0.9674^{+0.0079}_{-0.0083}$    | $z_{\text{re}}$             | $< 8.55$                        | $H(0.61)$                   | $92.9^{+2.5}_{-2.3}$      |
| $y_{\text{cal}}$                     | $1.0002^{+0.0049}_{-0.0049}$    | $10^9 A_s$                  | $2.086^{+0.050}_{-0.045}$       | $D_M(0.61)$                 | $2155^{+150}_{-100}$      |
| $A_{100}^{\text{PS}}$                | $238^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.875^{+0.021}_{-0.021}$       | $H(2.33)$                   | $231.4^{+4.6}_{-3.2}$     |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1219^{+24}_{-23}$              | $D_M(2.33)$                 | $5735^{+34}_{-30}$        |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                   | $5719^{+71}_{-75}$              | $f\sigma_8(0.15)$           | $0.480^{+0.026}_{-0.027}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{810}$                   | $2532^{+26}_{-25}$              | $\sigma_8(0.15)$            | $0.89^{+0.11}_{-0.14}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                  | $815.0^{+9.5}_{-9.4}$           | $f\sigma_8(0.38)$           | $0.562^{+0.075}_{-0.087}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $D_{2000}$                  | $230.3^{+3.1}_{-3.1}$           | $\sigma_8(0.38)$            | $0.80^{+0.11}_{-0.13}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9674^{+0.0079}_{-0.0083}$    | $f\sigma_8(0.51)$           | $0.579^{+0.090}_{-0.10}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.24539^{+0.00011}_{-0.00012}$ | $\sigma_8(0.51)$            | $0.746^{+0.098}_{-0.12}$  |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.582^{+0.094}_{-0.11}$  |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.40}$          | $10^5 \text{D/H}$           | $2.588^{+0.055}_{-0.055}$       | $\sigma_8(0.61)$            | $0.709^{+0.092}_{-0.12}$  |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $\text{Age/Gyr}$            | $13.56^{+0.23}_{-0.16}$         | $f\sigma_8(2.33)$           | $0.356^{+0.044}_{-0.056}$ |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1089.85^{+0.50}_{-0.50}$       | $\sigma_8(2.33)$            | $0.359^{+0.041}_{-0.051}$ |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.32}$          | $r_*$                       | $144.70^{+0.53}_{-0.53}$        | $f_{2000}^{143}$            | $29^{+6}_{-5}$            |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04113^{+0.00059}_{-0.00058}$ | $f_{2000}^{217}$            | $106.5^{+3.9}_{-3.8}$     |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.898^{+0.050}_{-0.050}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{TE}$                             | $0.9958^{+0.0096}_{-0.0096}$    | $z_{\text{drag}}$           | $1059.83^{+0.63}_{-0.63}$       | $\chi_{\text{lensing}}^2$   | $8.76 (\nu: 0.4)$         |
| $c_{EE}$                             | $0.9917^{+0.0094}_{-0.0099}$    | $r_{\text{drag}}$           | $147.37^{+0.54}_{-0.54}$        | $\chi_{\text{simall}}^2$    | $396.4 (\nu: 0.7)$        |
| $H_0$                                | $> 68.8$                        | $k_D$                       | $0.14056^{+0.00063}_{-0.00066}$ | $\chi_{\text{lowl}}^2$      | $22.41 (\nu: 0.3)$        |
| $\Omega_\Lambda$                     | $0.797^{+0.065}_{-0.10}$        | $100\theta_D$               | $0.16081^{+0.00037}_{-0.00037}$ | $\chi_{\text{CamSpec}}^2$   | $11513.0 (\nu: 14.8)$     |
| $\Omega_m$                           | $0.203^{+0.10}_{-0.065}$        | $z_{\text{eq}}$             | $3378^{+54}_{-51}$              | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$          |
| $\Omega_m h^2$                       | $0.1420^{+0.0022}_{-0.0021}$    | $k_{\text{eq}}$             | $0.01031^{+0.00016}_{-0.00016}$ | $\chi_{\text{CMB}}^2$       | $11940.6 (\nu: 16.2)$     |
| $\Omega_m h^3$                       | $0.121^{+0.021}_{-0.025}$       | $100\theta_{\text{eq}}$     | $0.8177^{+0.0099}_{-0.010}$     |                             |                           |
| $\sigma_8$                           | $0.95^{+0.11}_{-0.14}$          | $100\theta_{s,\text{eq}}$   | $0.4517^{+0.0050}_{-0.0052}$    |                             |                           |

$$\bar{\chi}_{\text{eff}}^2 = 11948.34; \Delta\bar{\chi}_{\text{eff}}^2 = -2.91; R - 1 = 0.02464$$



## 14.10 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02232^{+0.00027}_{-0.00028}$ | $S_8$                                 | $0.810^{+0.028}_{-0.028}$       | $H(0.15)$                   | $76.3^{+1.9}_{-1.9}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1196^{+0.0027}_{-0.0027}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.444^{+0.015}_{-0.016}$       | $D_{\mathrm{M}}(0.15)$      | $602^{+21}_{-20}$         |
| $100\theta_{\mathrm{MC}}$                | $1.04090^{+0.00061}_{-0.00062}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.619^{+0.020}_{-0.020}$       | $H(0.38)$                   | $83.86^{+0.74}_{-0.78}$   |
| $\tau$                                   | $0.054^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$                    | $1.008^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(0.38)$      | $1466^{+34}_{-33}$        |
| $w_0$                                    | $-1.20^{+0.11}_{-0.12}$         | $r_{\mathrm{drag}} h$                 | $108.3^{+4.9}_{-4.7}$           | $H(0.51)$                   | $89.58^{+0.69}_{-0.71}$   |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.026}_{-0.024}$       | $\langle d^2 \rangle^{1/2}$           | $2.462^{+0.059}_{-0.059}$       | $D_{\mathrm{M}}(0.51)$      | $1916^{+36}_{-34}$        |
| $n_{\mathrm{s}}$                         | $0.9661^{+0.0080}_{-0.0082}$    | $z_{\mathrm{re}}$                     | $< 8.65$                        | $H(0.61)$                   | $94.60^{+0.71}_{-0.78}$   |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0047}$    | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.054}_{-0.050}$       | $D_{\mathrm{M}}(0.61)$      | $2242^{+36}_{-34}$        |
| $A_{100}^{\mathrm{PS}}$                  | $238^{+40}_{-50}$               | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.023}_{-0.022}$       | $H(2.33)$                   | $233.8^{+1.7}_{-1.8}$     |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{40}$                              | $1225^{+24}_{-24}$              | $D_{\mathrm{M}}(2.33)$      | $5749^{+20}_{-19}$        |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+20}_{-30}$               | $D_{220}$                             | $5722^{+69}_{-76}$              | $f\sigma_8(0.15)$           | $0.468^{+0.020}_{-0.020}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{810}$                             | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.802^{+0.037}_{-0.033}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.62$                        | $D_{1420}$                            | $815.8^{+9.7}_{-9.3}$           | $f\sigma_8(0.38)$           | $0.507^{+0.027}_{-0.025}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.24}$          | $D_{2000}$                            | $230.4^{+3.2}_{-3.1}$           | $\sigma_8(0.38)$            | $0.713^{+0.032}_{-0.030}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $n_{\mathrm{s},0.002}$                | $0.9661^{+0.0080}_{-0.0082}$    | $f\sigma_8(0.51)$           | $0.512^{+0.029}_{-0.028}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}$                      | $0.24537^{+0.00011}_{-0.00011}$ | $\sigma_8(0.51)$            | $0.668^{+0.030}_{-0.027}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24670^{+0.00011}_{-0.00011}$ | $f\sigma_8(0.61)$           | $0.509^{+0.029}_{-0.028}$ |
| $A_{100}^{\mathrm{dust}}$                | $0.995^{+0.36}_{-0.37}$         | $10^5 \mathrm{D}/\mathrm{H}$          | $2.595^{+0.051}_{-0.051}$       | $\sigma_8(0.61)$            | $0.635^{+0.028}_{-0.026}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.33}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.693^{+0.061}_{-0.058}$      | $f\sigma_8(2.33)$           | $0.320^{+0.014}_{-0.013}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.19}$          | $z_*$                                 | $1089.95^{+0.47}_{-0.50}$       | $\sigma_8(2.33)$            | $0.326^{+0.012}_{-0.011}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $r_*$                                 | $144.58^{+0.63}_{-0.63}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$            |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0020}$    | $100\theta_*$                         | $1.04109^{+0.00062}_{-0.00063}$ | $f_{2000}^{217}$            | $106.8^{+3.9}_{-3.9}$     |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0029}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.887^{+0.062}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{TE}$                                 | $0.9959^{+0.0092}_{-0.0099}$    | $z_{\mathrm{drag}}$                   | $1059.79^{+0.58}_{-0.58}$       | $\chi_{\mathrm{simall}}^2$  | $396.6 (\nu: 0.8)$        |
| $c_{EE}$                                 | $0.9918^{+0.0093}_{-0.0097}$    | $r_{\mathrm{drag}}$                   | $147.26^{+0.66}_{-0.62}$        | $\chi_{\mathrm{lowl}}^2$    | $22.86 (\nu: 0.3)$        |
| $H_0$                                    | $73.5^{+3.3}_{-3.1}$            | $k_{\mathrm{D}}$                      | $0.14065^{+0.00070}_{-0.00072}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11513.4 (\nu: 14.3)$     |
| $\Omega_{\Lambda}$                       | $0.736^{+0.023}_{-0.025}$       | $100\theta_{\mathrm{D}}$              | $0.16084^{+0.00035}_{-0.00032}$ | $\chi_{\mathrm{H073p45}}^2$ | $1.0 (\nu: 1.0)$          |
| $\Omega_{\mathrm{m}}$                    | $0.264^{+0.025}_{-0.023}$       | $z_{\mathrm{eq}}$                     | $3391^{+60}_{-63}$              | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.0)$          |
| $\Omega_{\mathrm{m}} h^2$                | $0.1425^{+0.0025}_{-0.0026}$    | $k_{\mathrm{eq}}$                     | $0.01035^{+0.00018}_{-0.00019}$ | $\chi_{\mathrm{CMB}}^2$     | $11932.9 (\nu: 14.7)$     |
| $\Omega_{\mathrm{m}} h^3$                | $0.1048^{+0.0051}_{-0.0047}$    | $100\theta_{\mathrm{eq}}$             | $0.815^{+0.011}_{-0.011}$       |                             |                           |
| $\sigma_8$                               | $0.864^{+0.038}_{-0.034}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4504^{+0.0061}_{-0.0057}$    |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11941.58; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -12.43; R - 1 = 0.09840$$



### 14.11 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------|
| $\Omega_b h^2$              | 0.022331 | $0.02232^{+0.00031}_{-0.00030}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4490   | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | 83.11    | $83.08^{+0.62}_{-0.62}$   |
| $\Omega_c h^2$              | 0.11915  | $0.1193^{+0.0025}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6039   | $0.605^{+0.021}_{-0.021}$       | $D_M(0.38)$                 | 1522.4   | $1522^{+33}_{-33}$        |
| $100\theta_{MC}$            | 1.04092  | $1.04092^{+0.00060}_{-0.00061}$ | $\sigma_8/h^{0.5}$          | 0.9835   | $0.984^{+0.032}_{-0.030}$       | $H(0.51)$                   | 89.72    | $89.68^{+0.50}_{-0.53}$   |
| $\tau$                      | 0.0534   | $0.053^{+0.016}_{-0.015}$       | $r_{drag}h$                 | 100.49   | $100.6^{+4.1}_{-4.1}$           | $D_M(0.51)$                 | 1973.9   | $1974^{+34}_{-34}$        |
| $w_0$                       | -1.019   | $-1.02^{+0.11}_{-0.11}$         | $\langle d^2 \rangle^{1/2}$ | 2.430    | $2.431^{+0.063}_{-0.062}$       | $H(0.61)$                   | 95.27    | $95.22^{+0.63}_{-0.65}$   |
| $\ln(10^{10} A_s)$          | 3.0385   | $3.038^{+0.033}_{-0.032}$       | $z_{re}$                    | 7.58     | $7.5^{+1.6}_{-1.6}$             | $D_M(0.61)$                 | 2298.3   | $2298^{+34}_{-33}$        |
| $n_s$                       | 0.9669   | $0.9668^{+0.0084}_{-0.0084}$    | $10^9 A_s$                  | 2.087    | $2.087^{+0.069}_{-0.067}$       | $H(2.33)$                   | 235.67   | $235.7^{+1.5}_{-1.5}$     |
| $y_{cal}$                   | 1.0003   | $1.0005^{+0.0050}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | 1.8758   | $1.877^{+0.024}_{-0.022}$       | $D_M(2.33)$                 | 5761.2   | $5762^{+18}_{-18}$        |
| $A_{100}^{PS}$              | 241.5    | $240^{+50}_{-50}$               | $D_{40}$                    | 1223.2   | $1224^{+25}_{-24}$              | $f\sigma_8(0.15)$           | 0.4555   | $0.456^{+0.020}_{-0.018}$ |
| $A_{143}^{PS}$              | 42.1     | $39^{+20}_{-20}$                | $D_{220}$                   | 5719     | $5719^{+79}_{-76}$              | $\sigma_8(0.15)$            | 0.7510   | $0.752^{+0.038}_{-0.035}$ |
| $A_{217}^{PS}$              | 102.2    | $102^{+30}_{-30}$               | $D_{810}$                   | 2533.6   | $2535^{+28}_{-27}$              | $f\sigma_8(0.38)$           | 0.4759   | $0.477^{+0.028}_{-0.025}$ |
| $A_{217}^{CIB}$             | 39.1     | $40^{+10}_{-10}$                | $D_{1420}$                  | 815.6    | $815.9^{+9.7}_{-9.6}$           | $\sigma_8(0.38)$            | 0.6660   | $0.667^{+0.034}_{-0.031}$ |
| $A_{143}^{tSZ}$             | 3.40     | $< 7.47$                        | $D_{2000}$                  | 230.26   | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4752   | $0.476^{+0.030}_{-0.027}$ |
| $r_{143 \times 217}^{PS}$   | 0.669    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9669   | $0.9668^{+0.0084}_{-0.0084}$    | $\sigma_8(0.51)$            | 0.6233   | $0.624^{+0.031}_{-0.029}$ |
| $r_{143 \times 217}^{CIB}$  | 0.61     | —                               | $Y_P$                       | 0.245380 | $0.24537^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4705   | $0.472^{+0.030}_{-0.027}$ |
| $\xi^{tSZ \times CIB}$      | 0.69     | —                               | $Y_P^{BBN}$                 | 0.246706 | $0.24670^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5931   | $0.594^{+0.030}_{-0.027}$ |
| $A^{kSZ}$                   | 5.2      | —                               | $10^5 D/H$                  | 2.593    | $2.596^{+0.056}_{-0.056}$       | $f\sigma_8(2.33)$           | 0.2992   | $0.300^{+0.015}_{-0.014}$ |
| $A_{100}^{dust}$            | 1.018    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.786   | $13.786^{+0.064}_{-0.062}$      | $\sigma_8(2.33)$            | 0.3080   | $0.308^{+0.013}_{-0.012}$ |
| $A_{143}^{dust}$            | 0.972    | $0.96^{+0.35}_{-0.35}$          | $z_*$                       | 1089.89  | $1089.92^{+0.51}_{-0.51}$       | $f_{2000}^{143}$            | 29.9     | $30^{+5}_{-5}$            |
| $A_{217}^{dust}$            | 0.983    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.68   | $144.66^{+0.59}_{-0.59}$        | $f_{2000}^{217}$            | 106.82   | $106.8^{+3.7}_{-3.7}$     |
| $A_{143 \times 217}^{dust}$ | 1.024    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04111  | $1.04111^{+0.00060}_{-0.00060}$ | $f_{2000}^{143 \times 217}$ | 32.13    | $32^{+4}_{-4}$            |
| $c_{100}$                   | 0.99750  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.897   | $13.895^{+0.056}_{-0.055}$      | $\chi_{simall}^2$           | 395.90   | $396.9 (\nu: 1.4)$        |
| $c_{217}$                   | 1.00129  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.78  | $1059.76^{+0.67}_{-0.63}$       | $\chi_{lowl}^2$             | 22.84    | $22.91 (\nu: 0.4)$        |
| $c_{TE}$                    | 0.9965   | $0.9967^{+0.0097}_{-0.0095}$    | $r_{drag}$                  | 147.36   | $147.35^{+0.60}_{-0.60}$        | $\chi_{CamSpec}^2$          | 11499.9  | $11514.7 (\nu: 16.5)$     |
| $c_{EE}$                    | 0.9920   | $0.9921^{+0.0096}_{-0.0097}$    | $k_D$                       | 0.14055  | $0.14056^{+0.00068}_{-0.00070}$ | $\chi_{6DF}^2$              | 0.001    | $0.13 (\nu: 0.0)$         |
| $H_0$                       | 68.20    | $68.3^{+2.9}_{-2.9}$            | $100\theta_D$               | 0.160841 | $0.16085^{+0.00038}_{-0.00038}$ | $\chi_{MGS}^2$              | 1.61     | $1.78 (\nu: 0.5)$         |
| $\Omega_\Lambda$            | 0.6944   | $0.695^{+0.025}_{-0.024}$       | $z_{eq}$                    | 3381     | $3383^{+57}_{-56}$              | $\chi_{DR12BAO}^2$          | 4.04     | $4.9 (\nu: 1.0)$          |
| $\Omega_m$                  | 0.3056   | $0.305^{+0.024}_{-0.025}$       | $k_{eq}$                    | 0.010319 | $0.01033^{+0.00018}_{-0.00017}$ | $\chi_{prior}^2$            | 2.4      | $7.9 (\nu: 5.9)$          |
| $\Omega_m h^2$              | 0.14213  | $0.1422^{+0.0024}_{-0.0023}$    | $100\theta_{eq}$            | 0.8170   | $0.817^{+0.011}_{-0.011}$       | $\chi_{BAO}^2$              | 5.65     | $6.9 (\nu: 1.5)$          |
| $\Omega_m h^3$              | 0.09693  | $0.0971^{+0.0049}_{-0.0048}$    | $100\theta_{s,eq}$          | 0.4513   | $0.4512^{+0.0054}_{-0.0055}$    | $\chi_{CMB}^2$              | 11918.6  | $11934.5 (\nu: 16.6)$     |
| $\sigma_8$                  | 0.8122   | $0.814^{+0.040}_{-0.037}$       | $H(0.15)$                   | 73.25    | $73.3^{+1.8}_{-1.7}$            |                             |          |                           |
| $S_8$                       | 0.8198   | $0.820^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | 636.9    | $637^{+20}_{-21}$               |                             |          |                           |

Best-fit  $\chi_{\text{eff}}^2 = 11926.60$ ;  $\bar{\chi}_{\text{eff}}^2 = 11949.21$ ;  $\Delta\chi_{\text{eff}}^2 = 0.93$ ;  $R - 1 = 0.01464$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.61 DR12BAO: 4.04 CMB - simall-100x143.offlike5\_EE\_Aplanck.B: 395.90 commander\_dx12\_v3.2.29: 22.84 CamSpec like\_10.7HM\_1400\_unified: 11499.85



## 14.12 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02232^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.012}_{-0.011}$       | $H(0.38)$                   | $83.09^{+0.62}_{-0.61}$   |
| $\Omega_{\mathrm{c}} h^2$                | $0.1194^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$      | $1520^{+31}_{-32}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00060}_{-0.00060}$ | $\sigma_8/h^{0.5}$                    | $0.988^{+0.023}_{-0.023}$       | $H(0.51)$                   | $89.66^{+0.47}_{-0.47}$   |
| $\tau$                                   | $0.054^{+0.016}_{-0.014}$       | $r_{\mathrm{drag}} h$                 | $100.8^{+4.0}_{-4.0}$           | $D_{\mathrm{M}}(0.51)$      | $1972^{+33}_{-33}$        |
| $w_0$                                    | $-1.03^{+0.10}_{-0.11}$         | $\langle d^2 \rangle^{1/2}$           | $2.438^{+0.046}_{-0.047}$       | $H(0.61)$                   | $95.18^{+0.55}_{-0.62}$   |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.030}_{-0.028}$       | $z_{\mathrm{re}}$                     | $7.6^{+1.5}_{-1.5}$             | $D_{\mathrm{M}}(0.61)$      | $2297^{+33}_{-33}$        |
| $n_{\mathrm{s}}$                         | $0.9662^{+0.0079}_{-0.0080}$    | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.063}_{-0.059}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$     |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0051}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+17}_{-18}$        |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                              | $1226^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.458^{+0.015}_{-0.014}$ |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5722^{+78}_{-75}$              | $\sigma_8(0.15)$            | $0.756^{+0.032}_{-0.030}$ |
| $A_{217}^{\mathrm{PS}}$                  | $103^{+30}_{-30}$               | $D_{810}$                             | $2536^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.480^{+0.023}_{-0.021}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $816.0^{+9.6}_{-9.9}$           | $\sigma_8(0.38)$            | $0.670^{+0.028}_{-0.027}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $D_{2000}$                            | $230.4^{+3.3}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.479^{+0.025}_{-0.022}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.24}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9662^{+0.0079}_{-0.0080}$    | $\sigma_8(0.51)$            | $0.627^{+0.026}_{-0.025}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24537^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.474^{+0.025}_{-0.023}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.597^{+0.025}_{-0.024}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.596^{+0.055}_{-0.055}$       | $f\sigma_8(2.33)$           | $0.301^{+0.013}_{-0.012}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.783^{+0.062}_{-0.061}$      | $\sigma_8(2.33)$            | $0.310^{+0.011}_{-0.010}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $z_*$                                 | $1089.94^{+0.47}_{-0.48}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$            |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.21}_{-0.20}$          | $r_*$                                 | $144.62^{+0.51}_{-0.51}$        | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.8}$     |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.33}_{-0.32}$          | $100\theta_*$                         | $1.04110^{+0.00059}_{-0.00060}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.892^{+0.048}_{-0.048}$      | $\chi_{\mathrm{lensing}}^2$ | $9.26 (\nu: 0.3)$         |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.77^{+0.66}_{-0.63}$       | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$        |
| $c_{TE}$                                 | $0.9966^{+0.0096}_{-0.0092}$    | $r_{\mathrm{drag}}$                   | $147.31^{+0.53}_{-0.53}$        | $\chi_{\mathrm{lowl}}^2$    | $23.05 (\nu: 0.3)$        |
| $c_{EE}$                                 | $0.9922^{+0.0097}_{-0.0099}$    | $k_{\mathrm{D}}$                      | $0.14060^{+0.00063}_{-0.00065}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.0 (\nu: 15.4)$     |
| $H_0$                                    | $68.5^{+2.9}_{-2.6}$            | $100\theta_{\mathrm{D}}$              | $0.16085^{+0.00037}_{-0.00038}$ | $\chi_{6\mathrm{DF}}^2$     | $0.13 (\nu: 0.0)$         |
| $\Omega_{\Lambda}$                       | $0.696^{+0.024}_{-0.024}$       | $z_{\mathrm{eq}}$                     | $3387^{+49}_{-49}$              | $\chi_{\mathrm{MGS}}^2$     | $1.87 (\nu: 0.5)$         |
| $\Omega_{\mathrm{m}}$                    | $0.304^{+0.024}_{-0.024}$       | $k_{\mathrm{eq}}$                     | $0.01034^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $5.0 (\nu: 0.9)$          |
| $\Omega_{\mathrm{m}} h^2$                | $0.1424^{+0.0020}_{-0.0020}$    | $100\theta_{\mathrm{eq}}$             | $0.8159^{+0.0092}_{-0.0091}$    | $\chi_{\mathrm{prior}}^2$   | $7.9 (\nu: 6.1)$          |
| $\Omega_{\mathrm{m}} h^3$                | $0.0975^{+0.0047}_{-0.0043}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4508^{+0.0047}_{-0.0047}$    | $\chi_{\mathrm{CMB}}^2$     | $11943.2 (\nu: 16.8)$     |
| $\sigma_8$                               | $0.817^{+0.033}_{-0.031}$       | $H(0.15)$                             | $73.4^{+1.7}_{-1.6}$            | $\chi_{\mathrm{BAO}}^2$     | $7.0 (\nu: 1.5)$          |
| $S_8$                                    | $0.822^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$                | $635^{+19}_{-20}$               |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.08; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.68; R - 1 = 0.01812$$



### 14.13 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02232^{+0.00031}_{-0.00029}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.09^{+0.63}_{-0.61}$   |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1192^{+0.0025}_{-0.0025}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.021}_{-0.020}$       | $D_{\mathrm{M}}(0.38)$      | $1522^{+33}_{-33}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04093^{+0.00060}_{-0.00061}$ | $\sigma_8/h^{0.5}$                   | $0.986^{+0.031}_{-0.030}$       | $H(0.51)$                   | $89.68^{+0.50}_{-0.53}$   |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $100.6^{+4.1}_{-4.1}$           | $D_{\mathrm{M}}(0.51)$      | $1974^{+34}_{-34}$        |
| $w_0$                                    | $-1.02^{+0.11}_{-0.11}$         | $\langle d^2 \rangle^{1/2}$          | $2.433^{+0.061}_{-0.059}$       | $H(0.61)$                   | $95.23^{+0.62}_{-0.65}$   |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.041^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                    | $< 8.85$                        | $D_{\mathrm{M}}(0.61)$      | $2298^{+34}_{-33}$        |
| $n_{\mathrm{s}}$                         | $0.9669^{+0.0084}_{-0.0083}$    | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.060}_{-0.054}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$     |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0050}_{-0.0050}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.877^{+0.024}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+18}_{-18}$        |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                             | $1224^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.457^{+0.020}_{-0.018}$ |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                            | $5719^{+79}_{-76}$              | $\sigma_8(0.15)$            | $0.753^{+0.038}_{-0.035}$ |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                            | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.478^{+0.028}_{-0.025}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                           | $815.9^{+9.7}_{-9.6}$           | $\sigma_8(0.38)$            | $0.668^{+0.034}_{-0.031}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.48$                        | $D_{2000}$                           | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.477^{+0.030}_{-0.027}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9669^{+0.0084}_{-0.0083}$    | $\sigma_8(0.51)$            | $0.625^{+0.032}_{-0.029}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.472^{+0.031}_{-0.028}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.595^{+0.030}_{-0.027}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.595^{+0.055}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.300^{+0.015}_{-0.014}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.786^{+0.064}_{-0.062}$      | $\sigma_8(2.33)$            | $0.309^{+0.013}_{-0.012}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.91^{+0.50}_{-0.51}$       | $f_{2000}^{143}$            | $30^{+5}_{-5}$            |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                | $144.67^{+0.58}_{-0.59}$        | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.7}$     |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04112^{+0.00060}_{-0.00061}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.896^{+0.056}_{-0.055}$      | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.4)$        |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.77^{+0.66}_{-0.64}$       | $\chi_{\mathrm{lowl}}^2$    | $22.93 (\nu: 0.4)$        |
| $c_{TE}$                                 | $0.9966^{+0.0098}_{-0.0095}$    | $r_{\mathrm{drag}}$                  | $147.35^{+0.60}_{-0.60}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.5 (\nu: 16.3)$     |
| $c_{EE}$                                 | $0.9921^{+0.0096}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.14056^{+0.00068}_{-0.00069}$ | $\chi_{6\mathrm{DF}}^2$     | $0.13 (\nu: 0.0)$         |
| $H_0$                                    | $68.3^{+3.1}_{-2.7}$            | $100\theta_{\mathrm{D}}$             | $0.16085^{+0.00037}_{-0.00038}$ | $\chi_{\mathrm{MGS}}^2$     | $1.78 (\nu: 0.5)$         |
| $\Omega_{\Lambda}$                       | $0.695^{+0.025}_{-0.024}$       | $z_{\mathrm{eq}}$                    | $3382^{+57}_{-56}$              | $\chi_{\mathrm{DR12BAO}}^2$ | $4.9 (\nu: 1.0)$          |
| $\Omega_{\mathrm{m}}$                    | $0.305^{+0.024}_{-0.025}$       | $k_{\mathrm{eq}}$                    | $0.01032^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{prior}}^2$   | $7.9 (\nu: 5.9)$          |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1422^{+0.0024}_{-0.0023}$    | $100\theta_{\mathrm{eq}}$            | $0.817^{+0.011}_{-0.011}$       | $\chi_{\mathrm{BAO}}^2$     | $6.8 (\nu: 1.5)$          |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0971^{+0.0049}_{-0.0048}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4512^{+0.0055}_{-0.0055}$    | $\chi_{\mathrm{CMB}}^2$     | $11934.2 (\nu: 16.2)$     |
| $\sigma_8$                               | $0.815^{+0.040}_{-0.037}$       | $H(0.15)$                            | $73.3^{+1.8}_{-1.7}$            |                             |                           |
| $S_8$                                    | $0.821^{+0.026}_{-0.025}$       | $D_{\mathrm{M}}(0.15)$               | $637^{+20}_{-21}$               |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11948.94; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.95; R - 1 = 0.01259$$



# 14.14 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_post\_lensing\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|---------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02232^{+0.00030}_{-0.00028}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.012}_{-0.011}$       | $H(0.38)$                   | $83.10^{+0.62}_{-0.61}$   |
| $\Omega_{\mathrm{c}}h^2$               | $0.1194^{+0.0021}_{-0.0021}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$      | $1521^{+31}_{-32}$        |
| $100\theta_{\mathrm{MC}}$              | $1.04091^{+0.00059}_{-0.00061}$ | $\sigma_8/h^{0.5}$                   | $0.988^{+0.023}_{-0.023}$       | $H(0.51)$                   | $89.67^{+0.46}_{-0.47}$   |
| $\tau$                                 | $0.055^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}}h$                 | $100.8^{+4.0}_{-4.0}$           | $D_{\mathrm{M}}(0.51)$      | $1972^{+33}_{-33}$        |
| $w_0$                                  | $-1.03^{+0.10}_{-0.11}$         | $\langle d^2 \rangle^{1/2}$          | $2.439^{+0.046}_{-0.046}$       | $H(0.61)$                   | $95.20^{+0.54}_{-0.62}$   |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.043^{+0.027}_{-0.025}$       | $z_{\mathrm{re}}$                    | $< 8.89$                        | $D_{\mathrm{M}}(0.61)$      | $2297^{+32}_{-33}$        |
| $n_{\mathrm{s}}$                       | $0.9664^{+0.0078}_{-0.0078}$    | $10^9 A_{\mathrm{s}}$                | $2.096^{+0.056}_{-0.052}$       | $H(2.33)$                   | $235.7^{+1.4}_{-1.5}$     |
| $y_{\mathrm{cal}}$                     | $1.0006^{+0.0051}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.022}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+17}_{-18}$        |
| $A_{100}^{\mathrm{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                             | $1226^{+23}_{-22}$              | $f\sigma_8(0.15)$           | $0.458^{+0.015}_{-0.014}$ |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                            | $5722^{+79}_{-75}$              | $\sigma_8(0.15)$            | $0.756^{+0.032}_{-0.030}$ |
| $A_{217}^{\mathrm{PS}}$                | $103^{+30}_{-30}$               | $D_{810}$                            | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.479^{+0.023}_{-0.021}$ |
| $A_{217}^{\mathrm{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                           | $816.0^{+9.6}_{-9.8}$           | $\sigma_8(0.38)$            | $0.670^{+0.029}_{-0.027}$ |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.53$                        | $D_{2000}$                           | $230.4^{+3.3}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.479^{+0.025}_{-0.022}$ |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9664^{+0.0078}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.627^{+0.027}_{-0.025}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.474^{+0.025}_{-0.023}$ |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.597^{+0.025}_{-0.024}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.596^{+0.054}_{-0.054}$       | $f\sigma_8(2.33)$           | $0.301^{+0.013}_{-0.012}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.00^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.783^{+0.062}_{-0.061}$      | $\sigma_8(2.33)$            | $0.310^{+0.011}_{-0.010}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.93^{+0.47}_{-0.48}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$            |
| $A_{217}^{\mathrm{dust}}$              | $0.98^{+0.21}_{-0.20}$          | $r_*$                                | $144.63^{+0.51}_{-0.49}$        | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.7}$     |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04110^{+0.00059}_{-0.00060}$ | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$            |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.892^{+0.047}_{-0.048}$      | $\chi_{\mathrm{lensing}}^2$ | $9.22\ (\nu: 0.3)$        |
| $c_{217}$                              | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.77^{+0.66}_{-0.64}$       | $\chi_{\mathrm{simall}}^2$  | $396.9\ (\nu: 1.4)$       |
| $c_{TE}$                               | $0.9965^{+0.0096}_{-0.0092}$    | $r_{\mathrm{drag}}$                  | $147.32^{+0.53}_{-0.52}$        | $\chi_{\mathrm{lowl}}^2$    | $23.04\ (\nu: 0.3)$       |
| $c_{EE}$                               | $0.9921^{+0.0097}_{-0.010}$     | $k_{\mathrm{D}}$                     | $0.14059^{+0.00063}_{-0.00065}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11513.9\ (\nu: 15.4)$    |
| $H_0$                                  | $68.4^{+2.8}_{-2.8}$            | $100\theta_{\mathrm{D}}$             | $0.16085^{+0.00037}_{-0.00037}$ | $\chi_{6\mathrm{DF}}^2$     | $0.13\ (\nu: 0.0)$        |
| $\Omega_{\Lambda}$                     | $0.696^{+0.024}_{-0.024}$       | $z_{\mathrm{eq}}$                    | $3386^{+48}_{-48}$              | $\chi_{\mathrm{MGS}}^2$     | $1.86\ (\nu: 0.5)$        |
| $\Omega_{\mathrm{m}}$                  | $0.304^{+0.024}_{-0.024}$       | $k_{\mathrm{eq}}$                    | $0.01033^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.9\ (\nu: 0.9)$         |
| $\Omega_{\mathrm{m}}h^2$               | $0.1423^{+0.0020}_{-0.0020}$    | $100\theta_{\mathrm{eq}}$            | $0.8161^{+0.0091}_{-0.0090}$    | $\chi_{\mathrm{prior}}^2$   | $7.9\ (\nu: 6.1)$         |
| $\Omega_{\mathrm{m}}h^3$               | $0.0974^{+0.0047}_{-0.0043}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4509^{+0.0047}_{-0.0046}$    | $\chi_{\mathrm{CMB}}^2$     | $11943.0\ (\nu: 16.6)$    |
| $\sigma_8$                             | $0.817^{+0.033}_{-0.031}$       | $H(0.15)$                            | $73.4^{+1.7}_{-1.6}$            | $\chi_{\mathrm{BAO}}^2$     | $6.9\ (\nu: 1.5)$         |
| $S_8$                                  | $0.823^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$               | $636^{+19}_{-20}$               |                             |                           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11957.86; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.60; R - 1 = 0.01772$$



### 14.15 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022151 | $0.02219^{+0.00039}_{-0.00039}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6135   | $0.606^{+0.022}_{-0.022}$       | $H(0.38)$                   | 82.86    | $82.98^{+0.66}_{-0.66}$      |
| $\Omega_c h^2$              | 0.12025  | $0.1194^{+0.0030}_{-0.0030}$    | $\sigma_8/h^{0.5}$          | 0.9976   | $0.987^{+0.031}_{-0.031}$       | $D_M(0.38)$                 | 1525.4   | $1524^{+20}_{-20}$           |
| $100\theta_{MC}$            | 1.04092  | $1.04098^{+0.00084}_{-0.00084}$ | $r_{drag}h$                 | 100.43   | $100.5^{+2.4}_{-2.3}$           | $H(0.51)$                   | 89.45    | $89.59^{+0.64}_{-0.65}$      |
| $\tau$                      | 0.0540   | $0.053^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | 2.460    | $2.436^{+0.067}_{-0.067}$       | $D_M(0.51)$                 | 1978.3   | $1977^{+22}_{-23}$           |
| $w_0$                       | -1.037   | $-1.024^{+0.071}_{-0.073}$      | $z_{re}$                    | 7.69     | $7.6^{+1.6}_{-1.6}$             | $H(0.61)$                   | 94.99    | $95.14^{+0.67}_{-0.68}$      |
| $\ln(10^{10} A_s)$          | 3.0460   | $3.039^{+0.032}_{-0.032}$       | $10^9 A_s$                  | 2.103    | $2.088^{+0.068}_{-0.065}$       | $D_M(0.61)$                 | 2303.6   | $2301^{+23}_{-24}$           |
| $n_s$                       | 0.9637   | $0.9660^{+0.0093}_{-0.0094}$    | $10^9 A_s e^{-2\tau}$       | 1.8880   | $1.877^{+0.024}_{-0.024}$       | $H(2.33)$                   | 235.96   | $235.7^{+1.5}_{-1.5}$        |
| $y_{cal}$                   | 1.00232  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{40}$                    | 1234.6   | $1225^{+26}_{-26}$              | $D_M(2.33)$                 | 5769.7   | $5767^{+24}_{-24}$           |
| $A_{100}^{PS}$              | 245.2    | $243^{+50}_{-50}$               | $D_{220}$                   | 5730     | $5709^{+80}_{-79}$              | $f\sigma_8(0.15)$           | 0.4646   | $0.458^{+0.021}_{-0.020}$    |
| $A_{143}^{PS}$              | 38.9     | $41^{+20}_{-20}$                | $D_{810}$                   | 2543.3   | $2533^{+27}_{-27}$              | $\sigma_8(0.15)$            | 0.7614   | $0.753^{+0.027}_{-0.028}$    |
| $A_{217}^{PS}$              | 99.3     | $101^{+30}_{-30}$               | $D_{1420}$                  | 817.0    | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4855   | $0.478^{+0.023}_{-0.023}$    |
| $A_{217}^{CIB}$             | 45.0     | $41^{+10}_{-10}$                | $D_{2000}$                  | 230.42   | $229.7^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | 0.6747   | $0.668^{+0.024}_{-0.024}$    |
| $A_{143}^{tSZ}$             | 5.17     | $< 7.41$                        | $n_{s,0.002}$               | 0.9637   | $0.9660^{+0.0093}_{-0.0094}$    | $f\sigma_8(0.51)$           | 0.4845   | $0.478^{+0.024}_{-0.023}$    |
| $r_{143 \times 217}^{PS}$   | 0.560    | $0.65^{+0.25}_{-0.25}$          | $Y_P$                       | 0.245306 | $0.24532^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | 0.6311   | $0.625^{+0.022}_{-0.022}$    |
| $r_{143 \times 217}^{CIB}$  | 0.70     | —                               | $Y_P^{BBN}$                 | 0.246632 | $0.24665^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | 0.4796   | $0.473^{+0.023}_{-0.023}$    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $10^5 D/H$                  | 2.627    | $2.620^{+0.075}_{-0.073}$       | $\sigma_8(0.61)$            | 0.6003   | $0.595^{+0.020}_{-0.021}$    |
| $A^{kSZ}$                   | 2.3      | —                               | Age/Gyr                     | 13.798   | $13.797^{+0.056}_{-0.055}$      | $f\sigma_8(2.33)$           | 0.3026   | $0.2998^{+0.0099}_{-0.010}$  |
| $A_{100}^{dust}$            | 1.029    | $1.01^{+0.38}_{-0.38}$          | $z_*$                       | 1090.22  | $1090.10^{+0.65}_{-0.64}$       | $\sigma_8(2.33)$            | 0.3109   | $0.3085^{+0.0085}_{-0.0087}$ |
| $A_{143}^{dust}$            | 0.987    | $0.98^{+0.34}_{-0.34}$          | $r_*$                       | 144.53   | $144.72^{+0.73}_{-0.72}$        | $f_{2000}^{143}$            | 31.3     | $31^{+6}_{-6}$               |
| $A_{217}^{dust}$            | 0.965    | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04113  | $1.04118^{+0.00083}_{-0.00083}$ | $f_{2000}^{217}$            | 108.07   | $107.5^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{dust}$ | 1.017    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.883   | $13.899^{+0.069}_{-0.069}$      | $f_{2000}^{143 \times 217}$ | 33.18    | $33^{+4}_{-4}$               |
| $c_{100}$                   | 0.99756  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1059.44  | $1059.48^{+0.83}_{-0.88}$       | $\chi_{simall}^2$           | 396.06   | $396.9 (\nu: 1.5)$           |
| $c_{217}$                   | 1.00140  | $1.0012^{+0.0031}_{-0.0031}$    | $r_{drag}$                  | 147.27   | $147.44^{+0.76}_{-0.75}$        | $\chi_{lowl}^2$             | 23.45    | $23.05 (\nu: 0.5)$           |
| $H_0$                       | 68.19    | $68.1^{+1.6}_{-1.6}$            | $k_D$                       | 0.14051  | $0.14036^{+0.00092}_{-0.00091}$ | $\chi_{CamSpec}^2$          | 7049.7   | $7063.4 (\nu: 14.7)$         |
| $\Omega_\Lambda$            | 0.6924   | $0.693^{+0.015}_{-0.015}$       | $100\theta_D$               | 0.16106  | $0.16104^{+0.00051}_{-0.00050}$ | $\chi_{JLA}^2$              | 1034.75  | $1035.42 (\nu: 0.5)$         |
| $\Omega_m$                  | 0.3076   | $0.307^{+0.015}_{-0.015}$       | $z_{eq}$                    | 3403     | $3384^{+69}_{-68}$              | $\chi_{6DF}^2$              | 0.004    | $0.049 (\nu: 0.0)$           |
| $\Omega_m h^2$              | 0.14304  | $0.1423^{+0.0029}_{-0.0029}$    | $k_{eq}$                    | 0.010386 | $0.01033^{+0.00021}_{-0.00021}$ | $\chi_{MGS}^2$              | 1.47     | $1.64 (\nu: 0.2)$            |
| $\Omega_m h^3$              | 0.09754  | $0.0969^{+0.0032}_{-0.0032}$    | $100\theta_{eq}$            | 0.8126   | $0.816^{+0.013}_{-0.013}$       | $\chi_{DR12BAO}^2$          | 4.86     | $4.8 (\nu: 1.0)$             |
| $\sigma_8$                  | 0.8238   | $0.815^{+0.030}_{-0.030}$       | $100\theta_{s,eq}$          | 0.4492   | $0.4510^{+0.0067}_{-0.0066}$    | $\chi_{prior}^2$            | 3.0      | $7.7 (\nu: 6.1)$             |
| $S_8$                       | 0.8342   | $0.824^{+0.033}_{-0.032}$       | $H(0.15)$                   | 73.11    | $73.2^{+1.1}_{-1.0}$            | $\chi_{BAO}^2$              | 6.33     | $6.5 (\nu: 0.8)$             |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4569   | $0.451^{+0.018}_{-0.018}$       | $D_M(0.15)$                 | 637.6    | $638^{+12}_{-12}$               | $\chi_{CMB}^2$              | 7469.2   | $7483.4 (\nu: 14.6)$         |

Best-fit  $\chi_{eff}^2 = 8513.28$ ;  $\bar{\chi}_{eff}^2 = 8532.92$ ;  $R - 1 = 0.00642$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.47 DR12BAO: 4.86 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.06 commander\_dx12\_v3.2\_29: 23.45 CamSpec like\_10.7HM: 7049.66  
SN - JLA Pantheon18: 1034.75



14.16 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02219^{+0.00038}_{-0.00039}$ | $\sigma_8/h^{0.5}$          | $0.990^{+0.022}_{-0.022}$       | $H(0.51)$                   | $89.56^{+0.57}_{-0.58}$      |
| $\Omega_c h^2$                       | $0.1196^{+0.0025}_{-0.0024}$    | $r_{\text{drag}} h$         | $100.5^{+2.4}_{-2.3}$           | $D_M(0.51)$                 | $1976^{+22}_{-22}$           |
| $100\theta_{\text{MC}}$              | $1.04096^{+0.00083}_{-0.00084}$ | $\langle d^2 \rangle^{1/2}$ | $2.442^{+0.047}_{-0.048}$       | $H(0.61)$                   | $95.11^{+0.59}_{-0.61}$      |
| $\tau$                               | $0.054^{+0.016}_{-0.014}$       | $z_{\text{re}}$             | $7.7^{+1.5}_{-1.5}$             | $D_M(0.61)$                 | $2301^{+23}_{-23}$           |
| $w_0$                                | $-1.028^{+0.064}_{-0.066}$      | $10^9 A_s$                  | $2.093^{+0.062}_{-0.057}$       | $H(2.33)$                   | $235.7^{+1.3}_{-1.4}$        |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.029}_{-0.027}$       | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.021}_{-0.021}$       | $D_M(2.33)$                 | $5767^{+23}_{-23}$           |
| $n_s$                                | $0.9655^{+0.0085}_{-0.0086}$    | $D_{40}$                    | $1227^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.459^{+0.016}_{-0.015}$    |
| $y_{\text{cal}}$                     | $1.0006^{+0.0050}_{-0.0049}$    | $D_{220}$                   | $5712^{+81}_{-79}$              | $\sigma_8(0.15)$            | $0.755^{+0.022}_{-0.022}$    |
| $A_{100}^{\text{PS}}$                | $243^{+50}_{-50}$               | $D_{810}$                   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.480^{+0.018}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.670^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $229.8^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.479^{+0.018}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $n_{s,0.002}$               | $0.9655^{+0.0085}_{-0.0086}$    | $\sigma_8(0.51)$            | $0.627^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $Y_{\text{P}}$              | $0.24532^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.474^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24665^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.596^{+0.016}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.620^{+0.075}_{-0.071}$       | $f\sigma_8(2.33)$           | $0.3006^{+0.0081}_{-0.0083}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$     | $13.796^{+0.056}_{-0.055}$      | $\sigma_8(2.33)$            | $0.3092^{+0.0071}_{-0.0072}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.11^{+0.60}_{-0.60}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.37}$          | $r_*$                       | $144.68^{+0.61}_{-0.60}$        | $f_{2000}^{217}$            | $107.5^{+4.0}_{-3.9}$        |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $100\theta_*$               | $1.04116^{+0.00082}_{-0.00083}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.896^{+0.059}_{-0.058}$      | $\chi_{\text{lensing}}^2$   | $9.34 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.49^{+0.86}_{-0.86}$       | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.5)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | $147.40^{+0.66}_{-0.64}$        | $\chi_{\text{lowl}}^2$      | $23.17 (\nu: 0.4)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | $0.14040^{+0.00084}_{-0.00085}$ | $\chi_{\text{CamSpec}}^2$   | $7062.8 (\nu: 13.2)$         |
| $H_0$                                | $68.2^{+1.6}_{-1.6}$            | $100\theta_{\text{D}}$      | $0.16103^{+0.00051}_{-0.00050}$ | $\chi_{\text{JLA}}^2$       | $1035.38 (\nu: 0.4)$         |
| $\Omega_{\Lambda}$                   | $0.694^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | $3388^{+57}_{-57}$              | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.306^{+0.015}_{-0.015}$       | $k_{\text{eq}}$             | $0.01034^{+0.00017}_{-0.00017}$ | $\chi_{\text{MGS}}^2$       | $1.65 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1424^{+0.0024}_{-0.0024}$    | $100\theta_{\text{eq}}$     | $0.815^{+0.011}_{-0.010}$       | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 0.7)$             |
| $\Omega_{\text{m}} h^3$              | $0.0971^{+0.0029}_{-0.0028}$    | $100\theta_{\text{s,eq}}$   | $0.4506^{+0.0055}_{-0.0053}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.817^{+0.023}_{-0.023}$       | $H(0.15)$                   | $73.2^{+1.0}_{-1.0}$            | $\chi_{\text{CMB}}^2$       | $7492.3 (\nu: 14.3)$         |
| $S_8$                                | $0.826^{+0.024}_{-0.024}$       | $D_M(0.15)$                 | $637^{+12}_{-12}$               | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 0.6)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.452^{+0.013}_{-0.013}$       | $H(0.38)$                   | $82.97^{+0.61}_{-0.61}$         |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.608^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | $1524^{+20}_{-20}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8541.75; \Delta \bar{\chi}_{\text{eff}}^2 = 0.26; R - 1 = 0.00879$$



14.17 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02220^{+0.00039}_{-0.00039}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.607^{+0.021}_{-0.021}$       | $H(0.38)$                   | $82.99^{+0.66}_{-0.66}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1194^{+0.0030}_{-0.0030}$    | $\sigma_8/h^{0.5}$                    | $0.988^{+0.031}_{-0.031}$       | $D_{\mathrm{M}}(0.38)$      | $1524^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04098^{+0.00084}_{-0.00085}$ | $r_{\mathrm{drag}} h$                 | $100.5^{+2.4}_{-2.3}$           | $H(0.51)$                   | $89.59^{+0.64}_{-0.65}$      |
| $\tau$                                   | $0.055^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | $2.438^{+0.065}_{-0.065}$       | $D_{\mathrm{M}}(0.51)$      | $1977^{+22}_{-23}$           |
| $w_0$                                    | $-1.024^{+0.071}_{-0.072}$      | $z_{\mathrm{re}}$                     | $< 8.90$                        | $H(0.61)$                   | $95.14^{+0.67}_{-0.68}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.028}_{-0.026}$       | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.059}_{-0.055}$       | $D_{\mathrm{M}}(0.61)$      | $2301^{+23}_{-24}$           |
| $n_{\mathrm{s}}$                         | $0.9661^{+0.0093}_{-0.0094}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.024}_{-0.024}$       | $H(2.33)$                   | $235.7^{+1.5}_{-1.5}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $D_{40}$                              | $1225^{+27}_{-26}$              | $D_{\mathrm{M}}(2.33)$      | $5767^{+24}_{-24}$           |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{220}$                             | $5709^{+80}_{-79}$              | $f\sigma_8(0.15)$           | $0.458^{+0.021}_{-0.020}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{810}$                             | $2533^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.754^{+0.027}_{-0.027}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.479^{+0.023}_{-0.023}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $D_{2000}$                            | $229.7^{+3.5}_{-3.5}$           | $\sigma_8(0.38)$            | $0.669^{+0.023}_{-0.024}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.41$                        | $n_{\mathrm{s},0.002}$                | $0.9661^{+0.0093}_{-0.0094}$    | $f\sigma_8(0.51)$           | $0.478^{+0.023}_{-0.023}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24532^{+0.00016}_{-0.00017}$ | $\sigma_8(0.51)$            | $0.626^{+0.021}_{-0.022}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24665^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.473^{+0.023}_{-0.023}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.619^{+0.075}_{-0.073}$       | $\sigma_8(0.61)$            | $0.595^{+0.020}_{-0.020}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.797^{+0.056}_{-0.055}$      | $f\sigma_8(2.33)$           | $0.3001^{+0.0097}_{-0.010}$  |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_*$                                 | $1090.09^{+0.65}_{-0.64}$       | $\sigma_8(2.33)$            | $0.3089^{+0.0083}_{-0.0084}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $r_*$                                 | $144.72^{+0.73}_{-0.72}$        | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04118^{+0.00083}_{-0.00084}$ | $f_{2000}^{217}$            | $107.4^{+4.0}_{-4.0}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.900^{+0.069}_{-0.068}$      | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.49^{+0.87}_{-0.89}$       | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.5)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.45^{+0.76}_{-0.75}$        | $\chi_{\mathrm{lowl}}^2$    | $23.07 (\nu: 0.5)$           |
| $H_0$                                    | $68.1^{+1.6}_{-1.6}$            | $k_{\mathrm{D}}$                      | $0.14036^{+0.00092}_{-0.00091}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7063.2 (\nu: 14.5)$         |
| $\Omega_{\Lambda}$                       | $0.694^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{D}}$              | $0.16103^{+0.00051}_{-0.00050}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.42 (\nu: 0.5)$         |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.015}_{-0.015}$       | $z_{\mathrm{eq}}$                     | $3384^{+69}_{-69}$              | $\chi_{6\mathrm{DF}}^2$     | $0.049 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}} h^2$                | $0.1422^{+0.0029}_{-0.0029}$    | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{MGS}}^2$     | $1.64 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0969^{+0.0032}_{-0.0032}$    | $100\theta_{\mathrm{eq}}$             | $0.816^{+0.013}_{-0.013}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.0)$             |
| $\sigma_8$                               | $0.816^{+0.029}_{-0.030}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4510^{+0.0067}_{-0.0066}$    | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.1)$             |
| $S_8$                                    | $0.824^{+0.032}_{-0.032}$       | $H(0.15)$                             | $73.2^{+1.1}_{-1.0}$            | $\chi_{\mathrm{BAO}}^2$     | $6.5 (\nu: 0.8)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.452^{+0.018}_{-0.017}$       | $D_{\mathrm{M}}(0.15)$                | $638^{+12}_{-12}$               | $\chi_{\mathrm{CMB}}^2$     | $7483.1 (\nu: 14.2)$         |

$\bar{\chi}_{\mathrm{eff}}^2 = 8532.67; R - 1 = 0.00753$



## 14.18 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02220^{+0.00039}_{-0.00039}$ | $\sigma_8/h^{0.5}$          | $0.990^{+0.022}_{-0.022}$       | $H(0.51)$                   | $89.57^{+0.57}_{-0.57}$      |
| $\Omega_c h^2$                       | $0.1195^{+0.0024}_{-0.0024}$    | $r_{\text{drag}} h$         | $100.5^{+2.4}_{-2.3}$           | $D_M(0.51)$                 | $1976^{+22}_{-22}$           |
| $100\theta_{\text{MC}}$              | $1.04096^{+0.00083}_{-0.00084}$ | $\langle d^2 \rangle^{1/2}$ | $2.443^{+0.047}_{-0.047}$       | $H(0.61)$                   | $95.12^{+0.58}_{-0.61}$      |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $z_{\text{re}}$             | $< 8.92$                        | $D_M(0.61)$                 | $2301^{+23}_{-23}$           |
| $w_0$                                | $-1.027^{+0.064}_{-0.066}$      | $10^9 A_s$                  | $2.096^{+0.055}_{-0.051}$       | $H(2.33)$                   | $235.7^{+1.3}_{-1.4}$        |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.026}_{-0.024}$       | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.021}_{-0.021}$       | $D_M(2.33)$                 | $5767^{+23}_{-23}$           |
| $n_s$                                | $0.9656^{+0.0085}_{-0.0085}$    | $D_{40}$                    | $1226^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.459^{+0.015}_{-0.015}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0048}$    | $D_{220}$                   | $5711^{+80}_{-79}$              | $\sigma_8(0.15)$            | $0.756^{+0.022}_{-0.022}$    |
| $A_{100}^{\text{PS}}$                | $243^{+50}_{-50}$               | $D_{810}$                   | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.480^{+0.018}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.670^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $229.8^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.479^{+0.018}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+20}_{-10}$                | $n_{s,0.002}$               | $0.9656^{+0.0085}_{-0.0085}$    | $\sigma_8(0.51)$            | $0.627^{+0.017}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.36$                        | $Y_{\text{P}}$              | $0.24532^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.475^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24665^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.596^{+0.016}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.619^{+0.075}_{-0.071}$       | $f\sigma_8(2.33)$           | $0.3007^{+0.0080}_{-0.0083}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$     | $13.796^{+0.056}_{-0.055}$      | $\sigma_8(2.33)$            | $0.3094^{+0.0070}_{-0.0071}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.10^{+0.60}_{-0.60}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.37}$          | $r_*$                       | $144.69^{+0.60}_{-0.59}$        | $f_{2000}^{217}$            | $107.4^{+4.0}_{-3.9}$        |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.35}_{-0.34}$          | $100\theta_*$               | $1.04116^{+0.00082}_{-0.00084}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.897^{+0.059}_{-0.057}$      | $\chi_{\text{lensing}}^2$   | $9.30 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.50^{+0.86}_{-0.86}$       | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.5)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | $147.41^{+0.66}_{-0.64}$        | $\chi_{\text{lowl}}^2$      | $23.16 (\nu: 0.4)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | $0.14039^{+0.00084}_{-0.00085}$ | $\chi_{\text{CamSpec}}^2$   | $7062.8 (\nu: 13.2)$         |
| $H_0$                                | $68.2^{+1.6}_{-1.6}$            | $100\theta_{\text{D}}$      | $0.16103^{+0.00051}_{-0.00050}$ | $\chi_{\text{JLA}}^2$       | $1035.37 (\nu: 0.4)$         |
| $\Omega_{\Lambda}$                   | $0.694^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | $3387^{+56}_{-56}$              | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.306^{+0.015}_{-0.015}$       | $k_{\text{eq}}$             | $0.01034^{+0.00017}_{-0.00017}$ | $\chi_{\text{MGS}}^2$       | $1.65 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | $0.1424^{+0.0023}_{-0.0023}$    | $100\theta_{\text{eq}}$     | $0.816^{+0.011}_{-0.010}$       | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 0.7)$             |
| $\Omega_{\text{m}} h^3$              | $0.0971^{+0.0028}_{-0.0028}$    | $100\theta_{\text{s,eq}}$   | $0.4507^{+0.0054}_{-0.0053}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 6.1)$             |
| $\sigma_8$                           | $0.817^{+0.023}_{-0.023}$       | $H(0.15)$                   | $73.2^{+1.0}_{-1.0}$            | $\chi_{\text{CMB}}^2$       | $7492.2 (\nu: 14.1)$         |
| $S_8$                                | $0.826^{+0.024}_{-0.023}$       | $D_M(0.15)$                 | $637^{+12}_{-12}$               | $\chi_{\text{BAO}}^2$       | $6.5 (\nu: 0.6)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.452^{+0.013}_{-0.013}$       | $H(0.38)$                   | $82.98^{+0.61}_{-0.60}$         |                             |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.608^{+0.015}_{-0.016}$       | $D_M(0.38)$                 | $1524^{+20}_{-20}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8541.57; \Delta \bar{\chi}_{\text{eff}}^2 = 0.22; R - 1 = 0.00916$$



# 14.19 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022333 | $0.02232^{+0.00029}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4496   | $0.449^{+0.015}_{-0.014}$       | $H(0.38)$                   | 83.09    | $83.09^{+0.56}_{-0.54}$      |
| $\Omega_c h^2$                       | 0.11922  | $0.1192^{+0.0023}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6042   | $0.604^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | 1523.4   | $1523^{+20}_{-20}$           |
| $100\theta_{MC}$                     | 1.04096  | $1.04093^{+0.00062}_{-0.00059}$ | $\sigma_8/h^{0.5}$          | 0.9839   | $0.984^{+0.027}_{-0.027}$       | $H(0.51)$                   | 89.72    | $89.70^{+0.50}_{-0.51}$      |
| $\tau$                               | 0.0533   | $0.053^{+0.015}_{-0.015}$       | $r_{\text{drag}} h$         | 100.36   | $100.5^{+2.4}_{-2.3}$           | $D_M(0.51)$                 | 1975.0   | $1974^{+21}_{-21}$           |
| $w_0$                                | -1.017   | $-1.020^{+0.064}_{-0.068}$      | $\langle d^2 \rangle^{1/2}$ | 2.430    | $2.431^{+0.059}_{-0.058}$       | $H(0.61)$                   | 95.28    | $95.25^{+0.52}_{-0.54}$      |
| $\ln(10^{10} A_s)$                   | 3.0390   | $3.039^{+0.032}_{-0.032}$       | $z_{\text{re}}$             | 7.57     | $7.5^{+1.5}_{-1.6}$             | $D_M(0.61)$                 | 2299.3   | $2299^{+22}_{-22}$           |
| $n_s$                                | 0.9672   | $0.9668^{+0.0082}_{-0.0081}$    | $10^9 A_s$                  | 2.088    | $2.088^{+0.068}_{-0.066}$       | $H(2.33)$                   | 235.76   | $235.7^{+1.2}_{-1.2}$        |
| $y_{\text{cal}}$                     | 1.00050  | $1.0005^{+0.0049}_{-0.0050}$    | $10^9 A_s e^{-2\tau}$       | 1.8774   | $1.877^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | 5761.0   | $5762^{+18}_{-18}$           |
| $A_{100}^{\text{PS}}$                | 233.9    | $239^{+50}_{-50}$               | $D_{40}$                    | 1223.3   | $1224^{+24}_{-24}$              | $f\sigma_8(0.15)$           | 0.4558   | $0.456^{+0.017}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | 39.1     | $39^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5721^{+78}_{-77}$              | $\sigma_8(0.15)$            | 0.7508   | $0.751^{+0.025}_{-0.025}$    |
| $A_{217}^{\text{PS}}$                | 102.1    | $102^{+30}_{-30}$               | $D_{810}$                   | 2535.6   | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4759   | $0.476^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{CIB}}$               | 44.4     | $40^{+10}_{-10}$                | $D_{1420}$                  | 816.4    | $815.9^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6657   | $0.666^{+0.022}_{-0.022}$    |
| $A_{143}^{\text{tSZ}}$               | 6.56     | < 7.50                          | $D_{2000}$                  | 230.53   | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4751   | $0.476^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.597    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9672   | $0.9668^{+0.0082}_{-0.0081}$    | $\sigma_8(0.51)$            | 0.6231   | $0.623^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.76     | —                               | $Y_{\text{P}}$              | 0.245381 | $0.24537^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4704   | $0.471^{+0.020}_{-0.020}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.08     | —                               | $Y_{\text{P}}^{\text{BBN}}$ | 0.246707 | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.5929   | $0.593^{+0.019}_{-0.019}$    |
| $A^{\text{kSZ}}$                     | 0.1      | —                               | $10^5 D/H$                  | 2.592    | $2.595^{+0.056}_{-0.053}$       | $f\sigma_8(2.33)$           | 0.2990   | $0.2992^{+0.0094}_{-0.0095}$ |
| $A_{100}^{\text{dust}}$              | 1.014    | $1.01^{+0.39}_{-0.38}$          | Age/Gyr                     | 13.7863  | $13.787^{+0.046}_{-0.046}$      | $\sigma_8(2.33)$            | 0.3079   | $0.3080^{+0.0082}_{-0.0083}$ |
| $A_{143}^{\text{dust}}$              | 0.966    | $0.96^{+0.35}_{-0.35}$          | $z_*$                       | 1089.897 | $1089.91^{+0.49}_{-0.49}$       | $f_{2000}^{143}$            | 29.9     | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.967    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.66   | $144.67^{+0.55}_{-0.55}$        | $f_{2000}^{217}$            | 106.72   | $106.8^{+3.8}_{-3.7}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 1.011    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04115  | $1.04112^{+0.00061}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | 31.99    | $32^{+4}_{-4}$               |
| $c_{100}$                            | 0.99766  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.894   | $13.896^{+0.052}_{-0.052}$      | $\chi_{\text{simall}}^2$    | 395.88   | $396.9 (\nu: 1.3)$           |
| $c_{217}$                            | 1.00123  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.78  | $1059.77^{+0.62}_{-0.64}$       | $\chi_{\text{lowl}}^2$      | 22.80    | $22.94 (\nu: 0.4)$           |
| $c_{TE}$                             | 0.9964   | $0.9966^{+0.0095}_{-0.0097}$    | $r_{\text{drag}}$           | 147.34   | $147.35^{+0.57}_{-0.57}$        | $\chi_{\text{CamSpec}}^2$   | 11499.9  | $11514.5 (\nu: 16.0)$        |
| $c_{EE}$                             | 0.9922   | $0.9922^{+0.0098}_{-0.0096}$    | $k_{\text{D}}$              | 0.14058  | $0.14055^{+0.00066}_{-0.00066}$ | $\chi_{\text{JLA}}^2$       | 1034.72  | $1035.39 (\nu: 0.4)$         |
| $H_0$                                | 68.11    | $68.2^{+1.7}_{-1.6}$            | $100\theta_{\text{D}}$      | 0.160841 | $0.16085^{+0.00038}_{-0.00036}$ | $\chi_{6\text{DF}}^2$       | 0.002    | $0.048 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                   | 0.6935   | $0.694^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | 3383     | $3382^{+54}_{-53}$              | $\chi_{\text{MGS}}^2$       | 1.54     | $1.66 (\nu: 0.2)$            |
| $\Omega_{\text{m}}$                  | 0.3065   | $0.306^{+0.015}_{-0.015}$       | $k_{\text{eq}}$             | 0.010324 | $0.01032^{+0.00016}_{-0.00016}$ | $\chi_{\text{DR12BAO}}^2$   | 4.10     | $4.6 (\nu: 0.6)$             |
| $\Omega_{\text{m}} h^2$              | 0.14219  | $0.1422^{+0.0022}_{-0.0022}$    | $100\theta_{\text{eq}}$     | 0.8167   | $0.817^{+0.010}_{-0.0099}$      | $\chi_{\text{prior}}^2$     | 2.2      | $7.8 (\nu: 5.9)$             |
| $\Omega_{\text{m}} h^3$              | 0.09685  | $0.0969^{+0.0030}_{-0.0028}$    | $100\theta_{\text{s,eq}}$   | 0.4512   | $0.4512^{+0.0052}_{-0.0051}$    | $\chi_{\text{BAO}}^2$       | 5.64     | $6.26 (\nu: 0.5)$            |
| $\sigma_8$                           | 0.8120   | $0.813^{+0.027}_{-0.027}$       | $H(0.15)$                   | 73.20    | $73.2^{+1.0}_{-1.0}$            | $\chi_{\text{CMB}}^2$       | 11918.5  | $11934.4 (\nu: 16.2)$        |
| $S_8$                                | 0.8208   | $0.820^{+0.027}_{-0.026}$       | $D_M(0.15)$                 | 637.5    | $637^{+12}_{-12}$               |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 12961.06$ ;  $\bar{\chi}_{\text{eff}}^2 = 12983.86$ ;  $R - 1 = 0.00833$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.54 DR12BAO: 4.10 CMB - simall-100x143.offlike5\_EE\_Aplanck.B: 395.88 commander\_dx12\_v3.2.29: 22.80 CamSpec like\_10.7HM\_1400\_unified: 11499.86 SN - JLA Pantheon18: 1034.72



# 14.20 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02232^{+0.00029}_{-0.00029}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.011}_{-0.012}$       | $H(0.38)$                   | $83.07^{+0.53}_{-0.51}$      |
| $\Omega_{\mathrm{c}}h^2$               | $0.1194^{+0.0020}_{-0.0021}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.606^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.38)$      | $1522^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$              | $1.04091^{+0.00061}_{-0.00059}$ | $\sigma_8/h^{0.5}$                   | $0.987^{+0.020}_{-0.020}$       | $H(0.51)$                   | $89.68^{+0.46}_{-0.47}$      |
| $\tau$                                 | $0.054^{+0.014}_{-0.014}$       | $r_{\mathrm{drag}}h$                 | $100.5^{+2.4}_{-2.3}$           | $D_{\mathrm{M}}(0.51)$      | $1974^{+21}_{-21}$           |
| $w_0$                                  | $-1.024^{+0.060}_{-0.063}$      | $\langle d^2 \rangle^{1/2}$          | $2.437^{+0.044}_{-0.044}$       | $H(0.61)$                   | $95.22^{+0.47}_{-0.50}$      |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.041^{+0.029}_{-0.028}$       | $z_{\mathrm{re}}$                    | $7.6^{+1.4}_{-1.4}$             | $D_{\mathrm{M}}(0.61)$      | $2299^{+22}_{-22}$           |
| $n_{\mathrm{s}}$                       | $0.9663^{+0.0078}_{-0.0078}$    | $10^9 A_{\mathrm{s}}$                | $2.094^{+0.062}_{-0.057}$       | $H(2.33)$                   | $235.7^{+1.1}_{-1.1}$        |
| $y_{\mathrm{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+17}_{-17}$           |
| $A_{100}^{\mathrm{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                             | $1226^{+22}_{-22}$              | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                            | $5724^{+78}_{-77}$              | $\sigma_8(0.15)$            | $0.754^{+0.021}_{-0.020}$    |
| $A_{217}^{\mathrm{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                            | $2536^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.478^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                           | $816.0^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | $0.668^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.45$                        | $D_{2000}$                           | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.477^{+0.017}_{-0.016}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9663^{+0.0078}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.625^{+0.017}_{-0.017}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.473^{+0.017}_{-0.016}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.595^{+0.016}_{-0.016}$    |
| $A^{\mathrm{kSZ}}$                     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.595^{+0.054}_{-0.053}$       | $f\sigma_8(2.33)$           | $0.3001^{+0.0079}_{-0.0080}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.786^{+0.045}_{-0.045}$      | $\sigma_8(2.33)$            | $0.3089^{+0.0069}_{-0.0070}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.93^{+0.47}_{-0.47}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $r_*$                                | $144.63^{+0.49}_{-0.49}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.8}$        |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04110^{+0.00061}_{-0.00059}$ | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $c_{100}$                              | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.892^{+0.046}_{-0.047}$      | $\chi_{\mathrm{lensing}}^2$ | $9.24\ (\nu: 0.3)$           |
| $c_{217}$                              | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.77^{+0.62}_{-0.60}$       | $\chi_{\mathrm{simall}}^2$  | $396.9\ (\nu: 1.2)$          |
| $c_{TE}$                               | $0.9966^{+0.0095}_{-0.0097}$    | $r_{\mathrm{drag}}$                  | $147.32^{+0.51}_{-0.52}$        | $\chi_{\mathrm{lowl}}^2$    | $23.07\ (\nu: 0.3)$          |
| $c_{EE}$                               | $0.9921^{+0.0098}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.14059^{+0.00062}_{-0.00062}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.1\ (\nu: 14.9)$       |
| $H_0$                                  | $68.2^{+1.6}_{-1.6}$            | $100\theta_{\mathrm{D}}$             | $0.16085^{+0.00037}_{-0.00036}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.35\ (\nu: 0.4)$        |
| $\Omega_{\Lambda}$                     | $0.694^{+0.014}_{-0.015}$       | $z_{\mathrm{eq}}$                    | $3386^{+47}_{-47}$              | $\chi_{6\mathrm{DF}}^2$     | $0.047\ (\nu: 0.0)$          |
| $\Omega_{\mathrm{m}}$                  | $0.306^{+0.015}_{-0.014}$       | $k_{\mathrm{eq}}$                    | $0.01033^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{MGS}}^2$     | $1.67\ (\nu: 0.2)$           |
| $\Omega_{\mathrm{m}}h^2$               | $0.1423^{+0.0020}_{-0.0020}$    | $100\theta_{\mathrm{eq}}$            | $0.8161^{+0.0089}_{-0.0087}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.60\ (\nu: 0.5)$           |
| $\Omega_{\mathrm{m}}h^3$               | $0.0971^{+0.0027}_{-0.0026}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4509^{+0.0046}_{-0.0045}$    | $\chi_{\mathrm{prior}}^2$   | $7.8\ (\nu: 6.0)$            |
| $\sigma_8$                             | $0.815^{+0.022}_{-0.021}$       | $H(0.15)$                            | $73.3^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $11943.3\ (\nu: 16.1)$       |
| $S_8$                                  | $0.823^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$               | $637^{+12}_{-12}$               | $\chi_{\mathrm{BAO}}^2$     | $6.32\ (\nu: 0.4)$           |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12992.76; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.37; R - 1 = 0.01319$$



# 14.21 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02233^{+0.00029}_{-0.00029}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.09^{+0.56}_{-0.54}$      |
| $\Omega_{\mathrm{c}}h^2$               | $0.1192^{+0.0023}_{-0.0023}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.38)$      | $1523^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$              | $1.04093^{+0.00062}_{-0.00060}$ | $\sigma_8/h^{0.5}$                   | $0.985^{+0.026}_{-0.026}$       | $H(0.51)$                   | $89.71^{+0.50}_{-0.51}$      |
| $\tau$                                 | $0.055^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $100.5^{+2.4}_{-2.3}$           | $D_{\mathrm{M}}(0.51)$      | $1974^{+21}_{-21}$           |
| $w_0$                                  | $-1.020^{+0.063}_{-0.068}$      | $\langle d^2 \rangle^{1/2}$          | $2.433^{+0.057}_{-0.054}$       | $H(0.61)$                   | $95.26^{+0.52}_{-0.54}$      |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.041^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                    | $< 8.83$                        | $D_{\mathrm{M}}(0.61)$      | $2299^{+22}_{-22}$           |
| $n_{\mathrm{s}}$                       | $0.9669^{+0.0082}_{-0.0081}$    | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.058}_{-0.054}$       | $H(2.33)$                   | $235.7^{+1.2}_{-1.2}$        |
| $y_{\mathrm{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.877^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5761^{+17}_{-18}$           |
| $A_{100}^{\mathrm{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                             | $1224^{+24}_{-25}$              | $f\sigma_8(0.15)$           | $0.456^{+0.017}_{-0.017}$    |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                            | $5721^{+78}_{-77}$              | $\sigma_8(0.15)$            | $0.752^{+0.024}_{-0.024}$    |
| $A_{217}^{\mathrm{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                            | $2535^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.477^{+0.020}_{-0.019}$    |
| $A_{217}^{\mathrm{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                           | $815.9^{+9.6}_{-9.5}$           | $\sigma_8(0.38)$            | $0.667^{+0.021}_{-0.021}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.50$                        | $D_{2000}$                           | $230.4^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.476^{+0.020}_{-0.020}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9669^{+0.0082}_{-0.0081}$    | $\sigma_8(0.51)$            | $0.624^{+0.020}_{-0.019}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.471^{+0.020}_{-0.019}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.594^{+0.018}_{-0.018}$    |
| $A^{\mathrm{kSZ}}$                     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.594^{+0.056}_{-0.053}$       | $f\sigma_8(2.33)$           | $0.2996^{+0.0092}_{-0.0090}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.787^{+0.045}_{-0.045}$      | $\sigma_8(2.33)$            | $0.3085^{+0.0080}_{-0.0078}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.90^{+0.49}_{-0.49}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                                | $144.67^{+0.55}_{-0.55}$        | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.7}$        |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.31}_{-0.32}$          | $100\theta_*$                        | $1.04112^{+0.00062}_{-0.00059}$ | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.896^{+0.052}_{-0.052}$      | $\chi_{\mathrm{simall}}^2$  | $396.8\,(\nu: 1.3)$          |
| $c_{217}$                              | $1.0011^{+0.0031}_{-0.0030}$    | $z_{\mathrm{drag}}$                  | $1059.78^{+0.61}_{-0.64}$       | $\chi_{\mathrm{lowl}}^2$    | $22.96\,(\nu: 0.4)$          |
| $c_{TE}$                               | $0.9965^{+0.0095}_{-0.0097}$    | $r_{\mathrm{drag}}$                  | $147.36^{+0.57}_{-0.57}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.4\,(\nu: 15.9)$       |
| $c_{EE}$                               | $0.9921^{+0.0097}_{-0.0096}$    | $k_{\mathrm{D}}$                     | $0.14056^{+0.00065}_{-0.00066}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.39\,(\nu: 0.4)$        |
| $H_0$                                  | $68.2^{+1.6}_{-1.6}$            | $100\theta_{\mathrm{D}}$             | $0.16085^{+0.00037}_{-0.00036}$ | $\chi_{6\mathrm{DF}}^2$     | $0.048\,(\nu: 0.0)$          |
| $\Omega_{\Lambda}$                     | $0.694^{+0.015}_{-0.015}$       | $z_{\mathrm{eq}}$                    | $3382^{+54}_{-53}$              | $\chi_{\mathrm{MGS}}^2$     | $1.67\,(\nu: 0.2)$           |
| $\Omega_{\mathrm{m}}$                  | $0.306^{+0.015}_{-0.015}$       | $k_{\mathrm{eq}}$                    | $0.01032^{+0.00016}_{-0.00016}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.5\,(\nu: 0.5)$            |
| $\Omega_{\mathrm{m}}h^2$               | $0.1422^{+0.0022}_{-0.0022}$    | $100\theta_{\mathrm{eq}}$            | $0.817^{+0.010}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.8\,(\nu: 5.9)$            |
| $\Omega_{\mathrm{m}}h^3$               | $0.0969^{+0.0029}_{-0.0028}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4513^{+0.0053}_{-0.0051}$    | $\chi_{\mathrm{BAO}}^2$     | $6.25\,(\nu: 0.5)$           |
| $\sigma_8$                             | $0.814^{+0.026}_{-0.025}$       | $H(0.15)$                            | $73.2^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $11934.1\,(\nu: 15.9)$       |
| $S_8$                                  | $0.821^{+0.026}_{-0.026}$       | $D_{\mathrm{M}}(0.15)$               | $637^{+12}_{-12}$               |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12983.61; R - 1 = 0.00895$$



**14.22**    **base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing\_zre6p5**

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02232^{+0.00029}_{-0.00029}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.451^{+0.011}_{-0.012}$       | $H(0.38)$                   | $83.08^{+0.53}_{-0.51}$      |
| $\Omega_{\text{c}}h^2$               | $0.1193^{+0.0020}_{-0.0021}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.606^{+0.014}_{-0.014}$       | $D_{\text{M}}(0.38)$        | $1522^{+20}_{-20}$           |
| $100\theta_{\text{MC}}$              | $1.04091^{+0.00061}_{-0.00059}$ | $\sigma_8/h^{0.5}$                 | $0.987^{+0.020}_{-0.020}$       | $H(0.51)$                   | $89.68^{+0.46}_{-0.46}$      |
| $\tau$                               | $0.055^{+0.012}_{-0.011}$       | $r_{\text{drag}}h$                 | $100.5^{+2.4}_{-2.4}$           | $D_{\text{M}}(0.51)$        | $1974^{+21}_{-21}$           |
| $w_0$                                | $-1.023^{+0.060}_{-0.062}$      | $\langle d^2 \rangle^{1/2}$        | $2.438^{+0.043}_{-0.043}$       | $H(0.61)$                   | $95.23^{+0.47}_{-0.49}$      |
| $\ln(10^{10}A_{\text{s}})$           | $3.043^{+0.026}_{-0.024}$       | $z_{\text{re}}$                    | $< 8.83$                        | $D_{\text{M}}(0.61)$        | $2299^{+22}_{-22}$           |
| $n_{\text{s}}$                       | $0.9664^{+0.0078}_{-0.0078}$    | $10^9 A_{\text{s}}$                | $2.097^{+0.054}_{-0.050}$       | $H(2.33)$                   | $235.7^{+1.1}_{-1.1}$        |
| $y_{\text{cal}}$                     | $1.0006^{+0.0049}_{-0.0049}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.878^{+0.021}_{-0.021}$       | $D_{\text{M}}(2.33)$        | $5762^{+17}_{-17}$           |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{40}$                           | $1226^{+22}_{-22}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                          | $5724^{+78}_{-77}$              | $\sigma_8(0.15)$            | $0.754^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                          | $2536^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.478^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{1420}$                         | $816.0^{+9.6}_{-9.6}$           | $\sigma_8(0.38)$            | $0.669^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.45$                        | $D_{2000}$                         | $230.4^{+3.2}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.478^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $n_{\text{s},0.002}$               | $0.9664^{+0.0078}_{-0.0078}$    | $\sigma_8(0.51)$            | $0.626^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.473^{+0.017}_{-0.016}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24670^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.595^{+0.016}_{-0.016}$    |
| $A^{\text{kSZ}}$                     | —                               | $10^5\text{D}/\text{H}$            | $2.595^{+0.054}_{-0.052}$       | $f\sigma_8(2.33)$           | $0.3002^{+0.0079}_{-0.0079}$ |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $\text{Age}/\text{Gyr}$            | $13.786^{+0.045}_{-0.045}$      | $\sigma_8(2.33)$            | $0.3090^{+0.0069}_{-0.0069}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.35}_{-0.35}$          | $z_*$                              | $1089.92^{+0.46}_{-0.46}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.21}_{-0.20}$          | $r_*$                              | $144.64^{+0.48}_{-0.49}$        | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.7}$        |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.32}_{-0.32}$          | $100\theta_*$                      | $1.04110^{+0.00061}_{-0.00059}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                            | $0.9976^{+0.0021}_{-0.0021}$    | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.893^{+0.046}_{-0.047}$      | $\chi_{\text{lensing}}^2$   | $9.20 (\nu: 0.2)$            |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0030}$    | $z_{\text{drag}}$                  | $1059.78^{+0.61}_{-0.61}$       | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.3)$           |
| $c_{TE}$                             | $0.9965^{+0.0095}_{-0.0097}$    | $r_{\text{drag}}$                  | $147.32^{+0.51}_{-0.51}$        | $\chi_{\text{lowl}}^2$      | $23.07 (\nu: 0.3)$           |
| $c_{EE}$                             | $0.9921^{+0.0098}_{-0.0097}$    | $k_{\text{D}}$                     | $0.14059^{+0.00061}_{-0.00063}$ | $\chi_{\text{CamSpec}}^2$   | $11514.0 (\nu: 14.9)$        |
| $H_0$                                | $68.2^{+1.6}_{-1.6}$            | $100\theta_{\text{D}}$             | $0.16084^{+0.00037}_{-0.00036}$ | $\chi_{\text{JLA}}^2$       | $1035.35 (\nu: 0.4)$         |
| $\Omega_{\Lambda}$                   | $0.694^{+0.014}_{-0.015}$       | $z_{\text{eq}}$                    | $3385^{+46}_{-46}$              | $\chi_{6\text{DF}}^2$       | $0.047 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | $0.306^{+0.015}_{-0.014}$       | $k_{\text{eq}}$                    | $0.01033^{+0.00014}_{-0.00014}$ | $\chi_{\text{MGS}}^2$       | $1.68 (\nu: 0.2)$            |
| $\Omega_{\text{m}}h^2$               | $0.1423^{+0.0019}_{-0.0019}$    | $100\theta_{\text{eq}}$            | $0.8163^{+0.0089}_{-0.0086}$    | $\chi_{\text{DR12BAO}}^2$   | $4.58 (\nu: 0.5)$            |
| $\Omega_{\text{m}}h^3$               | $0.0971^{+0.0027}_{-0.0026}$    | $100\theta_{\text{s,eq}}$          | $0.4510^{+0.0046}_{-0.0044}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 6.0)$             |
| $\sigma_8$                           | $0.816^{+0.022}_{-0.021}$       | $H(0.15)$                          | $73.3^{+1.0}_{-1.0}$            | $\chi_{\text{CMB}}^2$       | $11943.1 (\nu: 15.9)$        |
| $S_8$                                | $0.823^{+0.021}_{-0.021}$       | $D_{\text{M}}(0.15)$               | $637^{+12}_{-12}$               | $\chi_{\text{BAO}}^2$       | $6.30 (\nu: 0.4)$            |

$$\bar{\chi}_{\text{eff}}^2 = 12992.59; \Delta\bar{\chi}_{\text{eff}}^2 = 0.34; R - 1 = 0.01370$$



### 14.23 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022203 | $0.02222^{+0.00040}_{-0.00039}$ | $\sigma_8/h^{0.5}$          | 1.0025   | $0.993^{+0.030}_{-0.032}$       | $H(0.51)$                   | 89.52    | $89.62^{+0.68}_{-0.66}$      |
| $\Omega_c h^2$                       | 0.12017  | $0.1196^{+0.0029}_{-0.0031}$    | $r_{\text{drag}} h$         | 101.84   | $102.1^{+2.1}_{-2.2}$           | $D_M(0.51)$                 | 1965.5   | $1963^{+21}_{-20}$           |
| $100\theta_{\text{MC}}$              | 1.04099  | $1.04101^{+0.00085}_{-0.00082}$ | $\langle d^2 \rangle^{1/2}$ | 2.467    | $2.444^{+0.064}_{-0.068}$       | $H(0.61)$                   | 94.97    | $95.05^{+0.71}_{-0.69}$      |
| $\tau$                               | 0.0574   | $0.054^{+0.017}_{-0.016}$       | $z_{\text{re}}$             | 8.03     | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2290.7   | $2288^{+22}_{-21}$           |
| $w_0$                                | -1.067   | $-1.062^{+0.069}_{-0.069}$      | $10^9 A_s$                  | 2.112    | $2.090^{+0.071}_{-0.067}$       | $H(2.33)$                   | 235.56   | $235.3^{+1.5}_{-1.5}$        |
| $\ln(10^{10} A_s)$                   | 3.0502   | $3.040^{+0.033}_{-0.033}$       | $10^9 A_s e^{-2\tau}$       | 1.8828   | $1.878^{+0.024}_{-0.025}$       | $D_M(2.33)$                 | 5763.6   | $5762^{+23}_{-24}$           |
| $n_s$                                | 0.9645   | $0.9660^{+0.0097}_{-0.0093}$    | $D_{40}$                    | 1230.8   | $1225^{+27}_{-26}$              | $f\sigma_8(0.15)$           | 0.4665   | $0.461^{+0.021}_{-0.021}$    |
| $y_{\text{cal}}$                     | 1.00099  | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                   | 5717     | $5711^{+81}_{-78}$              | $\sigma_8(0.15)$            | 0.7713   | $0.765^{+0.026}_{-0.028}$    |
| $A_{100}^{\text{PS}}$                | 238.7    | $241^{+50}_{-50}$               | $D_{810}$                   | 2536.9   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4908   | $0.485^{+0.023}_{-0.024}$    |
| $A_{143}^{\text{PS}}$                | 42.8     | $40^{+20}_{-20}$                | $D_{1420}$                  | 815.4    | $815^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | 0.6839   | $0.678^{+0.023}_{-0.024}$    |
| $A_{217}^{\text{PS}}$                | 97.1     | $101^{+30}_{-30}$               | $D_{2000}$                  | 230.16   | $230.0^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | 0.4909   | $0.485^{+0.023}_{-0.024}$    |
| $A_{217}^{\text{CIB}}$               | 46.2     | $41^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9645   | $0.9660^{+0.0097}_{-0.0093}$    | $\sigma_8(0.51)$            | 0.6398   | $0.635^{+0.021}_{-0.022}$    |
| $A_{143}^{\text{tSZ}}$               | 5.70     | $< 7.55$                        | $Y_{\text{P}}$              | 0.245327 | $0.24533^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | 0.4864   | $0.481^{+0.022}_{-0.023}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.566    | $0.65^{+0.25}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | 0.246653 | $0.24666^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | 0.6086   | $0.604^{+0.019}_{-0.020}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.91     | —                               | $10^5 D/H$                  | 2.617    | $2.614^{+0.074}_{-0.073}$       | $f\sigma_8(2.33)$           | 0.3068   | $0.3046^{+0.0093}_{-0.010}$  |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.29     | —                               | Age/Gyr                     | 13.773   | $13.771^{+0.053}_{-0.052}$      | $\sigma_8(2.33)$            | 0.3147   | $0.3126^{+0.0082}_{-0.0086}$ |
| $A^{\text{kSZ}}$                     | 1.7      | —                               | $z_*$                       | 1090.14  | $1090.07^{+0.64}_{-0.64}$       | $f_{2000}^{143}$            | 31.1     | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | 1.012    | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | 144.51   | $144.65^{+0.75}_{-0.72}$        | $f_{2000}^{217}$            | 107.40   | $107.3^{+4.0}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | 1.003    | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$               | 1.04119  | $1.04121^{+0.00084}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | 32.58    | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | 0.954    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.880   | $13.893^{+0.071}_{-0.068}$      | $\chi_{\text{simall}}^2$    | 396.83   | $397.0 (\nu: 1.7)$           |
| $A_{143 \times 217}^{\text{dust}}$   | 0.931    | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | 1059.55  | $1059.57^{+0.86}_{-0.85}$       | $\chi_{\text{lowl}}^2$      | 23.38    | $23.02 (\nu: 0.5)$           |
| $c_{100}$                            | 0.99751  | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | 147.23   | $147.37^{+0.78}_{-0.75}$        | $\chi_{\text{CamSpec}}^2$   | 7049.3   | $7063.1 (\nu: 14.5)$         |
| $c_{217}$                            | 1.00152  | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | 0.14059  | $0.14046^{+0.00091}_{-0.00092}$ | $\chi_{\text{H073p45}}^2$   | 6.64     | $6.6 (\nu: 2.7)$             |
| $H_0$                                | 69.17    | $69.3^{+1.4}_{-1.5}$            | $100\theta_{\text{D}}$      | 0.16100  | $0.16099^{+0.00051}_{-0.00049}$ | $\chi_{\text{JLA}}^2$       | 1035.92  | $1036.5 (\nu: 1.8)$          |
| $\Omega_{\Lambda}$                   | 0.7011   | $0.703^{+0.013}_{-0.014}$       | $z_{\text{eq}}$             | 3402     | $3388^{+68}_{-70}$              | $\chi_{6\text{DF}}^2$       | 0.036    | $0.099 (\nu: 0.0)$           |
| $\Omega_{\text{m}}$                  | 0.2989   | $0.297^{+0.014}_{-0.013}$       | $k_{\text{eq}}$             | 0.010384 | $0.01034^{+0.00021}_{-0.00021}$ | $\chi_{\text{MGS}}^2$       | 2.19     | $2.43 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^2$              | 0.14302  | $0.1424^{+0.0028}_{-0.0029}$    | $100\theta_{\text{eq}}$     | 0.8129   | $0.815^{+0.013}_{-0.012}$       | $\chi_{\text{DR12BAO}}^2$   | 4.41     | $4.71 (\nu: 0.4)$            |
| $\Omega_{\text{m}} h^3$              | 0.09893  | $0.0987^{+0.0030}_{-0.0031}$    | $100\theta_{\text{s,eq}}$   | 0.4493   | $0.4506^{+0.0069}_{-0.0064}$    | $\chi_{\text{prior}}^2$     | 2.6      | $7.6 (\nu: 6.0)$             |
| $\sigma_8$                           | 0.8338   | $0.826^{+0.029}_{-0.030}$       | $H(0.15)$                   | 73.74    | $73.84^{+0.93}_{-0.96}$         | $\chi_{\text{BAO}}^2$       | 6.64     | $7.2 (\nu: 0.7)$             |
| $S_8$                                | 0.8322   | $0.822^{+0.032}_{-0.033}$       | $D_M(0.15)$                 | 630.5    | $630^{+11}_{-10}$               | $\chi_{\text{CMB}}^2$       | 7469.5   | $7483.1 (\nu: 14.6)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | 0.4558   | $0.450^{+0.017}_{-0.018}$       | $H(0.38)$                   | 83.09    | $83.20^{+0.68}_{-0.66}$         |                             |          |                              |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | 0.6165   | $0.610^{+0.021}_{-0.022}$       | $D_M(0.38)$                 | 1513.4   | $1511^{+18}_{-18}$              |                             |          |                              |

Best-fit  $\chi_{\text{eff}}^2 = 8521.38$ ;  $\bar{\chi}_{\text{eff}}^2 = 8541.10$ ;  $R - 1 = 0.00624$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.04 MGS: 2.19 DR12BAO: 4.41 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.83 commander\_dx12\_v3.2.29: 23.38 CamSpec like\_10.7HM: 7049.34  
Hubble - H073p45: 6.64 SN - JLA Pantheon18: 1035.92



14.24 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02223^{+0.00040}_{-0.00038}$ | $\sigma_8/h^{0.5}$                 | $0.994^{+0.022}_{-0.022}$       | $H(0.51)$                   | $89.61^{+0.62}_{-0.59}$      |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1196^{+0.0025}_{-0.0025}$    | $r_{\mathrm{drag}}h$               | $102.1^{+2.1}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1963^{+20}_{-19}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04100^{+0.00085}_{-0.00080}$ | $\langle d^2 \rangle^{1/2}$        | $2.447^{+0.047}_{-0.048}$       | $H(0.61)$                   | $95.04^{+0.65}_{-0.61}$      |
| $\tau$                                   | $0.054^{+0.016}_{-0.015}$       | $z_{\mathrm{re}}$                  | $7.7^{+1.5}_{-1.5}$             | $D_{\mathrm{M}}(0.61)$      | $2288^{+21}_{-21}$           |
| $w_0$                                    | $-1.063^{+0.062}_{-0.061}$      | $10^9 A_{\mathrm{s}}$              | $2.093^{+0.064}_{-0.059}$       | $H(2.33)$                   | $235.3^{+1.3}_{-1.3}$        |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.041^{+0.030}_{-0.029}$       | $10^9 A_{\mathrm{s}}e^{-2\tau}$    | $1.879^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+23}_{-23}$           |
| $n_{\mathrm{s}}$                         | $0.9657^{+0.0086}_{-0.0087}$    | $D_{40}$                           | $1226^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.461^{+0.015}_{-0.015}$    |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0049}_{-0.0049}$    | $D_{220}$                          | $5713^{+81}_{-77}$              | $\sigma_8(0.15)$            | $0.766^{+0.020}_{-0.021}$    |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{810}$                          | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.486^{+0.018}_{-0.017}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                         | $815^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | $0.679^{+0.018}_{-0.018}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                         | $230.0^{+3.5}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.486^{+0.018}_{-0.018}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9657^{+0.0086}_{-0.0087}$    | $\sigma_8(0.51)$            | $0.636^{+0.016}_{-0.017}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.61$                        | $Y_{\mathrm{P}}$                   | $0.24533^{+0.00016}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.482^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24666^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.605^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.613^{+0.073}_{-0.073}$       | $f\sigma_8(2.33)$           | $0.3049^{+0.0076}_{-0.0078}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | Age/Gyr                            | $13.770^{+0.053}_{-0.053}$      | $\sigma_8(2.33)$            | $0.3130^{+0.0068}_{-0.0068}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1090.07^{+0.59}_{-0.61}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                              | $144.64^{+0.62}_{-0.61}$        | $f_{2000}^{217}$            | $107.3^{+4.0}_{-4.0}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$                      | $1.04120^{+0.00085}_{-0.00080}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.892^{+0.059}_{-0.059}$      | $\chi_{\mathrm{lensing}}^2$ | $9.25 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                | $1059.57^{+0.89}_{-0.86}$       | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.5)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                | $147.35^{+0.66}_{-0.66}$        | $\chi_{\mathrm{lowl}}^2$    | $23.08 (\nu: 0.4)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                   | $0.14048^{+0.00084}_{-0.00083}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7062.7 (\nu: 13.7)$         |
| $H_0$                                    | $69.3^{+1.4}_{-1.5}$            | $100\theta_{\mathrm{D}}$           | $0.16098^{+0.00050}_{-0.00051}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.5 (\nu: 2.6)$             |
| $\Omega_{\Lambda}$                       | $0.703^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                  | $3390^{+57}_{-57}$              | $\chi_{\mathrm{JLA}}^2$     | $1036.6 (\nu: 1.7)$          |
| $\Omega_{\mathrm{m}}$                    | $0.297^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                  | $0.01035^{+0.00017}_{-0.00017}$ | $\chi_{6\mathrm{DF}}^2$     | $0.10 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1425^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{eq}}$          | $0.815^{+0.011}_{-0.010}$       | $\chi_{\mathrm{MGS}}^2$     | $2.45 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0987^{+0.0027}_{-0.0028}$    | $100\theta_{\mathrm{s,eq}}$        | $0.4505^{+0.0055}_{-0.0053}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.64 (\nu: 0.3)$            |
| $\sigma_8$                               | $0.827^{+0.022}_{-0.022}$       | $H(0.15)$                          | $73.86^{+0.92}_{-0.94}$         | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.8)$             |
| $S_8$                                    | $0.823^{+0.023}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$             | $629^{+11}_{-9.9}$              | $\chi_{\mathrm{CMB}}^2$     | $7492.0 (\nu: 14.8)$         |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$      | $0.451^{+0.013}_{-0.013}$       | $H(0.38)$                          | $83.20^{+0.62}_{-0.61}$         | $\chi_{\mathrm{BAO}}^2$     | $7.2 (\nu: 0.6)$             |
| $\sigma_8\Omega_{\mathrm{m}}^{0.25}$     | $0.611^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$             | $1511^{+18}_{-17}$              |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8549.81; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.99; R - 1 = 0.01112$$



14.25 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02223^{+0.00040}_{-0.00039}$ | $\sigma_8/h^{0.5}$                 | $0.994^{+0.030}_{-0.031}$       | $H(0.51)$                   | $89.62^{+0.68}_{-0.66}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1195^{+0.0029}_{-0.0030}$    | $r_{\mathrm{drag}} h$              | $102.1^{+2.1}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1963^{+21}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04102^{+0.00085}_{-0.00081}$ | $\langle d^2 \rangle^{1/2}$        | $2.446^{+0.063}_{-0.066}$       | $H(0.61)$                   | $95.06^{+0.71}_{-0.68}$      |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $z_{\mathrm{re}}$                  | $< 8.98$                        | $D_{\mathrm{M}}(0.61)$      | $2288^{+22}_{-21}$           |
| $w_0$                                    | $-1.061^{+0.069}_{-0.069}$      | $10^9 A_{\mathrm{s}}$              | $2.096^{+0.062}_{-0.056}$       | $H(2.33)$                   | $235.3^{+1.5}_{-1.5}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.029}_{-0.027}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$   | $1.878^{+0.024}_{-0.025}$       | $D_{\mathrm{M}}(2.33)$      | $5761^{+23}_{-24}$           |
| $n_{\mathrm{s}}$                         | $0.9661^{+0.0096}_{-0.0092}$    | $D_{40}$                           | $1225^{+27}_{-26}$              | $f\sigma_8(0.15)$           | $0.461^{+0.020}_{-0.021}$    |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                          | $5711^{+81}_{-78}$              | $\sigma_8(0.15)$            | $0.765^{+0.026}_{-0.027}$    |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{810}$                          | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.485^{+0.023}_{-0.023}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                         | $815^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | $0.679^{+0.022}_{-0.023}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                         | $230.0^{+3.6}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.486^{+0.023}_{-0.023}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$             | $0.9661^{+0.0096}_{-0.0092}$    | $\sigma_8(0.51)$            | $0.635^{+0.020}_{-0.021}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.55$                        | $Y_{\mathrm{P}}$                   | $0.24533^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.482^{+0.022}_{-0.023}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$    | $0.24666^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.605^{+0.019}_{-0.020}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$       | $2.613^{+0.074}_{-0.073}$       | $f\sigma_8(2.33)$           | $0.3049^{+0.0091}_{-0.0096}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$        | $13.771^{+0.053}_{-0.052}$      | $\sigma_8(2.33)$            | $0.3130^{+0.0080}_{-0.0081}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                              | $1090.06^{+0.64}_{-0.64}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                              | $144.66^{+0.75}_{-0.72}$        | $f_{2000}^{217}$            | $107.2^{+4.0}_{-4.0}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$                      | $1.04122^{+0.00084}_{-0.00081}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$ | $13.893^{+0.071}_{-0.068}$      | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.8)$           |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                | $1059.57^{+0.86}_{-0.86}$       | $\chi_{\mathrm{lowl}}^2$    | $23.03 (\nu: 0.5)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                | $147.37^{+0.78}_{-0.75}$        | $\chi_{\mathrm{CamSpec}}^2$ | $7062.9 (\nu: 14.4)$         |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                   | $0.14046^{+0.00090}_{-0.00091}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.6 (\nu: 2.7)$             |
| $H_0$                                    | $69.3^{+1.5}_{-1.5}$            | $100\theta_{\mathrm{D}}$           | $0.16099^{+0.00050}_{-0.00049}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.5 (\nu: 1.8)$          |
| $\Omega_{\Lambda}$                       | $0.703^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                  | $3388^{+68}_{-70}$              | $\chi_{6\mathrm{DF}}^2$     | $0.10 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}}$                    | $0.297^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                  | $0.01034^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{MGS}}^2$     | $2.44 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1424^{+0.0028}_{-0.0029}$    | $100\theta_{\mathrm{eq}}$          | $0.816^{+0.013}_{-0.012}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $4.70 (\nu: 0.4)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0986^{+0.0030}_{-0.0031}$    | $100\theta_{\mathrm{s,eq}}$        | $0.4507^{+0.0068}_{-0.0064}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.827^{+0.028}_{-0.029}$       | $H(0.15)$                          | $73.85^{+0.93}_{-0.96}$         | $\chi_{\mathrm{BAO}}^2$     | $7.2 (\nu: 0.7)$             |
| $S_8$                                    | $0.823^{+0.032}_{-0.032}$       | $D_{\mathrm{M}}(0.15)$             | $630^{+11}_{-10}$               | $\chi_{\mathrm{CMB}}^2$     | $7482.9 (\nu: 14.3)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.451^{+0.017}_{-0.017}$       | $H(0.38)$                          | $83.20^{+0.68}_{-0.66}$         |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$    | $0.611^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$             | $1511^{+19}_{-18}$              |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 8540.87$ ;  $R - 1 = 0.00534$



14.26 base\_w\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02223^{+0.00039}_{-0.00038}$ | $\sigma_8/h^{0.5}$          | $0.994^{+0.022}_{-0.022}$       | $H(0.51)$                   | $89.62^{+0.61}_{-0.58}$      |
| $\Omega_c h^2$                       | $0.1195^{+0.0024}_{-0.0024}$    | $r_{\text{drag}} h$         | $102.1^{+2.1}_{-2.2}$           | $D_M(0.51)$                 | $1963^{+21}_{-19}$           |
| $100\theta_{\text{MC}}$              | $1.04100^{+0.00085}_{-0.00080}$ | $\langle d^2 \rangle^{1/2}$ | $2.448^{+0.046}_{-0.047}$       | $H(0.61)$                   | $95.06^{+0.64}_{-0.59}$      |
| $\tau$                               | $0.055^{+0.013}_{-0.012}$       | $z_{\text{re}}$             | $< 8.92$                        | $D_M(0.61)$                 | $2287^{+21}_{-21}$           |
| $w_0$                                | $-1.062^{+0.062}_{-0.060}$      | $10^9 A_s$                  | $2.097^{+0.057}_{-0.051}$       | $H(2.33)$                   | $235.3^{+1.3}_{-1.3}$        |
| $\ln(10^{10} A_s)$                   | $3.043^{+0.027}_{-0.025}$       | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | $5761^{+22}_{-23}$           |
| $n_s$                                | $0.9659^{+0.0086}_{-0.0084}$    | $D_{40}$                    | $1226^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.461^{+0.015}_{-0.015}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0049}$    | $D_{220}$                   | $5713^{+81}_{-77}$              | $\sigma_8(0.15)$            | $0.766^{+0.020}_{-0.021}$    |
| $A_{100}^{\text{PS}}$                | $241^{+50}_{-50}$               | $D_{810}$                   | $2534^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.486^{+0.017}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{1420}$                  | $815^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | $0.679^{+0.018}_{-0.018}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $230.0^{+3.5}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.486^{+0.018}_{-0.018}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $n_{s,0.002}$               | $0.9659^{+0.0086}_{-0.0084}$    | $\sigma_8(0.51)$            | $0.636^{+0.016}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.64$                        | $Y_{\text{P}}$              | $0.24534^{+0.00016}_{-0.00016}$ | $f\sigma_8(0.61)$           | $0.482^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.26}_{-0.25}$          | $Y_{\text{P}}^{\text{BBN}}$ | $0.24666^{+0.00016}_{-0.00016}$ | $\sigma_8(0.61)$            | $0.605^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 \text{D}/\text{H}$    | $2.612^{+0.073}_{-0.072}$       | $f\sigma_8(2.33)$           | $0.3051^{+0.0076}_{-0.0078}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $\text{Age}/\text{Gyr}$     | $13.770^{+0.053}_{-0.052}$      | $\sigma_8(2.33)$            | $0.3131^{+0.0067}_{-0.0067}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.06^{+0.58}_{-0.60}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | $144.65^{+0.61}_{-0.60}$        | $f_{2000}^{217}$            | $107.3^{+4.0}_{-4.0}$        |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$               | $1.04120^{+0.00084}_{-0.00080}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.893^{+0.059}_{-0.058}$      | $\chi_{\text{lensing}}^2$   | $9.22 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.58^{+0.89}_{-0.83}$       | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.6)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | $147.37^{+0.65}_{-0.65}$        | $\chi_{\text{lowl}}^2$      | $23.06 (\nu: 0.4)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\text{D}}$              | $0.14047^{+0.00084}_{-0.00083}$ | $\chi_{\text{CamSpec}}^2$   | $7062.6 (\nu: 13.6)$         |
| $H_0$                                | $69.3^{+1.4}_{-1.5}$            | $100\theta_{\text{D}}$      | $0.16098^{+0.00050}_{-0.00050}$ | $\chi_{\text{H073p45}}^2$   | $6.5 (\nu: 2.6)$             |
| $\Omega_{\Lambda}$                   | $0.703^{+0.013}_{-0.014}$       | $z_{\text{eq}}$             | $3388^{+55}_{-57}$              | $\chi_{\text{JLA}}^2$       | $1036.5 (\nu: 1.7)$          |
| $\Omega_{\text{m}}$                  | $0.297^{+0.014}_{-0.013}$       | $k_{\text{eq}}$             | $0.01034^{+0.00017}_{-0.00017}$ | $\chi_{6\text{DF}}^2$       | $0.10 (\nu: 0.0)$            |
| $\Omega_{\text{m}} h^2$              | $0.1424^{+0.0023}_{-0.0024}$    | $100\theta_{\text{eq}}$     | $0.816^{+0.010}_{-0.010}$       | $\chi_{\text{MGS}}^2$       | $2.46 (\nu: 0.2)$            |
| $\Omega_{\text{m}} h^3$              | $0.0987^{+0.0027}_{-0.0027}$    | $100\theta_{\text{s,eq}}$   | $0.4507^{+0.0054}_{-0.0053}$    | $\chi_{\text{DR12BAO}}^2$   | $4.61 (\nu: 0.3)$            |
| $\sigma_8$                           | $0.828^{+0.022}_{-0.022}$       | $H(0.15)$                   | $73.87^{+0.93}_{-0.95}$         | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 5.8)$             |
| $S_8$                                | $0.823^{+0.023}_{-0.024}$       | $D_M(0.15)$                 | $629^{+11}_{-10}$               | $\chi_{\text{CMB}}^2$       | $7491.8 (\nu: 14.5)$         |
| $\sigma_8 \Omega_{\text{m}}^{0.5}$   | $0.451^{+0.013}_{-0.013}$       | $H(0.38)$                   | $83.21^{+0.62}_{-0.60}$         | $\chi_{\text{BAO}}^2$       | $7.2 (\nu: 0.6)$             |
| $\sigma_8 \Omega_{\text{m}}^{0.25}$  | $0.611^{+0.015}_{-0.016}$       | $D_M(0.38)$                 | $1511^{+18}_{-17}$              |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8549.61; \Delta\bar{\chi}_{\text{eff}}^2 = -3.12; R - 1 = 0.01012$$



# 14.27 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022344 | $0.02233^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4481   | $0.448^{+0.014}_{-0.014}$       | $H(0.38)$                   | 83.30    | $83.30^{+0.56}_{-0.54}$      |
| $\Omega_c h^2$              | 0.11925  | $0.1193^{+0.0023}_{-0.0022}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6069   | $0.607^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | 1510.6   | $1510^{+18}_{-18}$           |
| $100\theta_{MC}$            | 1.04095  | $1.04094^{+0.00059}_{-0.00058}$ | $\sigma_8/h^{0.5}$          | 0.9883   | $0.989^{+0.025}_{-0.025}$       | $H(0.51)$                   | 89.74    | $89.72^{+0.52}_{-0.51}$      |
| $\tau$                      | 0.0531   | $0.053^{+0.015}_{-0.015}$       | $r_{drag} h$                | 101.96   | $102.1^{+2.3}_{-2.2}$           | $D_M(0.51)$                 | 1961.6   | $1961^{+20}_{-20}$           |
| $w_0$                       | -1.053   | $-1.056^{+0.061}_{-0.062}$      | $\langle d^2 \rangle^{1/2}$ | 2.435    | $2.436^{+0.055}_{-0.055}$       | $H(0.61)$                   | 95.19    | $95.16^{+0.54}_{-0.54}$      |
| $\ln(10^{10} A_s)$          | 3.0387   | $3.038^{+0.032}_{-0.032}$       | $z_{re}$                    | 7.55     | $7.5^{+1.5}_{-1.6}$             | $D_M(0.61)$                 | 2286.0   | $2286^{+20}_{-20}$           |
| $n_s$                       | 0.9671   | $0.9667^{+0.0083}_{-0.0080}$    | $10^9 A_s$                  | 2.088    | $2.087^{+0.067}_{-0.065}$       | $H(2.33)$                   | 235.27   | $235.2^{+1.2}_{-1.2}$        |
| $y_{cal}$                   | 1.00045  | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8772   | $1.877^{+0.022}_{-0.022}$       | $D_M(2.33)$                 | 5757.0   | $5758^{+17}_{-18}$           |
| $A_{100}^{PS}$              | 233.8    | $240^{+50}_{-50}$               | $D_{40}$                    | 1222.9   | $1224^{+24}_{-24}$              | $f\sigma_8(0.15)$           | 0.4577   | $0.458^{+0.016}_{-0.016}$    |
| $A_{143}^{PS}$              | 39.3     | $39^{+20}_{-20}$                | $D_{220}$                   | 5720     | $5721^{+75}_{-77}$              | $\sigma_8(0.15)$            | 0.7609   | $0.762^{+0.023}_{-0.023}$    |
| $A_{217}^{PS}$              | 102.2    | $102^{+30}_{-30}$               | $D_{810}$                   | 2535.2   | $2535^{+26}_{-27}$              | $f\sigma_8(0.38)$           | 0.4816   | $0.482^{+0.019}_{-0.018}$    |
| $A_{217}^{CIB}$             | 44.2     | $40^{+10}_{-10}$                | $D_{1420}$                  | 816.3    | $816.0^{+9.4}_{-9.5}$           | $\sigma_8(0.38)$            | 0.6751   | $0.676^{+0.020}_{-0.020}$    |
| $A_{143}^{tSZ}$             | 6.58     | < 7.48                          | $D_{2000}$                  | 230.55   | $230.4^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | 0.4820   | $0.483^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{PS}$   | 0.600    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9671   | $0.9667^{+0.0083}_{-0.0080}$    | $\sigma_8(0.51)$            | 0.6319   | $0.632^{+0.018}_{-0.019}$    |
| $r_{143 \times 217}^{CIB}$  | 0.78     | —                               | $Y_P$                       | 0.245385 | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | 0.4778   | $0.478^{+0.019}_{-0.019}$    |
| $\xi^{tSZ \times CIB}$      | 0.11     | —                               | $Y_P^{BBN}$                 | 0.246712 | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.6012   | $0.602^{+0.017}_{-0.018}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $10^5 D/H$                  | 2.590    | $2.593^{+0.055}_{-0.054}$       | $f\sigma_8(2.33)$           | 0.3033   | $0.3036^{+0.0085}_{-0.0088}$ |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | Age/Gyr                     | 13.7637  | $13.764^{+0.043}_{-0.043}$      | $\sigma_8(2.33)$            | 0.3116   | $0.3118^{+0.0076}_{-0.0077}$ |
| $A_{143}^{dust}$            | 0.977    | $0.96^{+0.35}_{-0.34}$          | $z_*$                       | 1089.886 | $1089.90^{+0.49}_{-0.49}$       | $f_{2000}^{143}$            | 29.7     | $30^{+6}_{-6}$               |
| $A_{217}^{dust}$            | 0.971    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.65   | $144.65^{+0.54}_{-0.53}$        | $f_{2000}^{217}$            | 106.67   | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{dust}$ | 1.002    | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | 1.04114  | $1.04113^{+0.00059}_{-0.00058}$ | $f_{2000}^{143 \times 217}$ | 31.95    | $32^{+4}_{-4}$               |
| $c_{100}$                   | 0.99765  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.893   | $13.894^{+0.050}_{-0.050}$      | $\chi_{simall}^2$           | 395.86   | $396.9 (\nu: 1.3)$           |
| $c_{217}$                   | 1.00129  | $1.0011^{+0.0030}_{-0.0031}$    | $z_{drag}$                  | 1059.82  | $1059.80^{+0.63}_{-0.63}$       | $\chi_{lowl}^2$             | 22.75    | $22.88 (\nu: 0.4)$           |
| $c_{TE}$                    | 0.9964   | $0.9965^{+0.0098}_{-0.0096}$    | $r_{drag}$                  | 147.32   | $147.33^{+0.55}_{-0.54}$        | $\chi_{CamSpec}^2$          | 11499.6  | $11514.4 (\nu: 15.8)$        |
| $c_{EE}$                    | 0.9917   | $0.9919^{+0.0097}_{-0.0097}$    | $k_D$                       | 0.14061  | $0.14059^{+0.00064}_{-0.00065}$ | $\chi_{H073p45}^2$          | 6.53     | $6.5 (\nu: 2.7)$             |
| $H_0$                       | 69.21    | $69.3^{+1.6}_{-1.5}$            | $100\theta_D$               | 0.160825 | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{JLA}^2$              | 1035.62  | $1036.4 (\nu: 1.7)$          |
| $\Omega_\Lambda$            | 0.7030   | $0.704^{+0.013}_{-0.014}$       | $z_{eq}$                    | 3384     | $3384^{+52}_{-51}$              | $\chi_{6DF}^2$              | 0.054    | $0.10 (\nu: 0.0)$            |
| $\Omega_m$                  | 0.2970   | $0.296^{+0.014}_{-0.013}$       | $k_{eq}$                    | 0.010327 | $0.01033^{+0.00016}_{-0.00016}$ | $\chi_{MGS}^2$              | 2.35     | $2.47 (\nu: 0.2)$            |
| $\Omega_m h^2$              | 0.14224  | $0.1422^{+0.0022}_{-0.0021}$    | $100\theta_{eq}$            | 0.8166   | $0.8165^{+0.0097}_{-0.0097}$    | $\chi_{DR12BAO}^2$          | 4.05     | $4.51 (\nu: 0.3)$            |
| $\Omega_m h^3$              | 0.09844  | $0.0986^{+0.0027}_{-0.0027}$    | $100\theta_{s,eq}$          | 0.4511   | $0.4511^{+0.0050}_{-0.0050}$    | $\chi_{prior}^2$            | 2.2      | $7.8 (\nu: 5.8)$             |
| $\sigma_8$                  | 0.8222   | $0.823^{+0.024}_{-0.025}$       | $H(0.15)$                   | 73.87    | $73.91^{+0.97}_{-0.94}$         | $\chi_{BAO}^2$              | 6.46     | $7.1 (\nu: 0.7)$             |
| $S_8$                       | 0.8180   | $0.818^{+0.026}_{-0.025}$       | $D_M(0.15)$                 | 629.7    | $629^{+11}_{-11}$               | $\chi_{CMB}^2$              | 11918.2  | $11934.1 (\nu: 16.1)$        |

Best-fit  $\chi_{eff}^2 = 12969.03$ ;  $\bar{\chi}_{eff}^2 = 12991.92$ ;  $R - 1 = 0.00648$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.05 MGS: 2.35 DR12BAO: 4.05 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.86 commander\_dx12\_v3\_2\_29: 22.75 CamSpec like\_10.7HM\_1400\_unified: 11499.61 Hubble - H073p45: 6.54 SN - JLA Pantheon18: 1035.62



14.28 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00029}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.014}_{-0.014}$       | $H(0.51)$                   | $89.71^{+0.48}_{-0.48}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1193^{+0.0021}_{-0.0020}$    | $\sigma_8/h^{0.5}$                    | $0.990^{+0.020}_{-0.020}$       | $D_{\mathrm{M}}(0.51)$      | $1961^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04093^{+0.00058}_{-0.00057}$ | $r_{\mathrm{drag}} h$                 | $102.1^{+2.3}_{-2.2}$           | $H(0.61)$                   | $95.14^{+0.50}_{-0.51}$      |
| $\tau$                                   | $0.054^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$           | $2.441^{+0.043}_{-0.043}$       | $D_{\mathrm{M}}(0.61)$      | $2285^{+20}_{-20}$           |
| $w_0$                                    | $-1.059^{+0.058}_{-0.060}$      | $z_{\mathrm{re}}$                     | $7.6^{+1.4}_{-1.5}$             | $H(2.33)$                   | $235.3^{+1.1}_{-1.1}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.028}_{-0.028}$       | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.060}_{-0.057}$       | $D_{\mathrm{M}}(2.33)$      | $5758^{+17}_{-18}$           |
| $n_{\mathrm{s}}$                         | $0.9664^{+0.0080}_{-0.0077}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.020}_{-0.021}$       | $f\sigma_8(0.15)$           | $0.459^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0048}$    | $D_{40}$                              | $1225^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.763^{+0.019}_{-0.020}$    |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{220}$                             | $5724^{+72}_{-75}$              | $f\sigma_8(0.38)$           | $0.483^{+0.015}_{-0.015}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{810}$                             | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.677^{+0.017}_{-0.017}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{1420}$                            | $816.1^{+9.3}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.484^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                            | $230.4^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | $0.634^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.53$                        | $n_{\mathrm{s},0.002}$                | $0.9664^{+0.0080}_{-0.0077}$    | $f\sigma_8(0.61)$           | $0.480^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.603^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3042^{+0.0074}_{-0.0075}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.593^{+0.055}_{-0.053}$       | $\sigma_8(2.33)$            | $0.3123^{+0.0065}_{-0.0066}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.763^{+0.043}_{-0.043}$      | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_*$                                 | $1089.91^{+0.47}_{-0.47}$       | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $r_*$                                 | $144.63^{+0.49}_{-0.48}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04111^{+0.00058}_{-0.00056}$ | $\chi_{\mathrm{lensing}}^2$ | $9.13 (\nu: 0.2)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.892^{+0.046}_{-0.046}$      | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.2)$           |
| $c_{100}$                                | $0.9976^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.80^{+0.63}_{-0.63}$       | $\chi_{\mathrm{lowl}}^2$    | $22.98 (\nu: 0.3)$           |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.31^{+0.51}_{-0.49}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11513.9 (\nu: 15.5)$        |
| $c_{TE}$                                 | $0.9964^{+0.0098}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14061^{+0.00060}_{-0.00062}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.4 (\nu: 2.7)$             |
| $c_{EE}$                                 | $0.9919^{+0.0098}_{-0.0097}$    | $100\theta_{\mathrm{D}}$              | $0.16083^{+0.00037}_{-0.00036}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.5 (\nu: 1.8)$          |
| $H_0$                                    | $69.3^{+1.6}_{-1.5}$            | $z_{\mathrm{eq}}$                     | $3386^{+47}_{-46}$              | $\chi_{6\mathrm{DF}}^2$     | $0.11 (\nu: 0.0)$            |
| $\Omega_{\Lambda}$                       | $0.704^{+0.013}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{MGS}}^2$     | $2.48 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.296^{+0.014}_{-0.013}$       | $100\theta_{\mathrm{eq}}$             | $0.8162^{+0.0088}_{-0.0088}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.51 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1423^{+0.0020}_{-0.0019}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4509^{+0.0045}_{-0.0045}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0987^{+0.0026}_{-0.0026}$    | $H(0.15)$                             | $73.92^{+0.96}_{-0.95}$         | $\chi_{\mathrm{CMB}}^2$     | $11942.9 (\nu: 16.7)$        |
| $\sigma_8$                               | $0.825^{+0.020}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$                | $629^{+11}_{-11}$               | $\chi_{\mathrm{BAO}}^2$     | $7.1 (\nu: 0.7)$             |
| $S_8$                                    | $0.819^{+0.021}_{-0.020}$       | $H(0.38)$                             | $83.29^{+0.53}_{-0.51}$         |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.449^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$                | $1510^{+18}_{-18}$              |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 13000.66; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.98; R - 1 = 0.00726$$



**14.29 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_zre6p5**

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.448^{+0.014}_{-0.013}$       | $H(0.38)$                   | $83.30^{+0.56}_{-0.54}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1192^{+0.0023}_{-0.0022}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1510^{+18}_{-18}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04094^{+0.00060}_{-0.00058}$ | $\sigma_8/h^{0.5}$                    | $0.990^{+0.024}_{-0.024}$       | $H(0.51)$                   | $89.73^{+0.52}_{-0.52}$      |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $r_{\mathrm{drag}} h$                 | $102.1^{+2.3}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1961^{+20}_{-20}$           |
| $w_0$                                    | $-1.056^{+0.061}_{-0.062}$      | $\langle d^2 \rangle^{1/2}$           | $2.439^{+0.053}_{-0.052}$       | $H(0.61)$                   | $95.17^{+0.54}_{-0.54}$      |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.027}_{-0.025}$       | $z_{\mathrm{re}}$                     | $< 8.83$                        | $D_{\mathrm{M}}(0.61)$      | $2286^{+20}_{-20}$           |
| $n_{\mathrm{s}}$                         | $0.9669^{+0.0083}_{-0.0080}$    | $10^9 A_{\mathrm{s}}$                 | $2.093^{+0.057}_{-0.053}$       | $H(2.33)$                   | $235.2^{+1.2}_{-1.2}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5757^{+18}_{-18}$           |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{40}$                              | $1224^{+24}_{-25}$              | $f\sigma_8(0.15)$           | $0.458^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5720^{+74}_{-77}$              | $\sigma_8(0.15)$            | $0.762^{+0.022}_{-0.023}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2535^{+26}_{-27}$              | $f\sigma_8(0.38)$           | $0.483^{+0.018}_{-0.018}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $815.9^{+9.4}_{-9.5}$           | $\sigma_8(0.38)$            | $0.677^{+0.019}_{-0.020}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.47$                        | $D_{2000}$                            | $230.4^{+3.1}_{-3.1}$           | $f\sigma_8(0.51)$           | $0.483^{+0.019}_{-0.018}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9669^{+0.0083}_{-0.0080}$    | $\sigma_8(0.51)$            | $0.633^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.479^{+0.018}_{-0.018}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.602^{+0.017}_{-0.017}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.592^{+0.056}_{-0.054}$       | $f\sigma_8(2.33)$           | $0.3039^{+0.0083}_{-0.0084}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$           | $13.764^{+0.043}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3122^{+0.0073}_{-0.0073}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $z_*$                                 | $1089.90^{+0.49}_{-0.49}$       | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $r_*$                                 | $144.66^{+0.54}_{-0.53}$        | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$                         | $1.04113^{+0.00059}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.894^{+0.050}_{-0.051}$      | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.3)$           |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.80^{+0.63}_{-0.63}$       | $\chi_{\mathrm{lowl}}^2$    | $22.89 (\nu: 0.4)$           |
| $c_{TE}$                                 | $0.9964^{+0.0098}_{-0.0096}$    | $r_{\mathrm{drag}}$                   | $147.33^{+0.55}_{-0.54}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.2 (\nu: 15.7)$        |
| $c_{EE}$                                 | $0.9919^{+0.0097}_{-0.0097}$    | $k_{\mathrm{D}}$                      | $0.14059^{+0.00064}_{-0.00065}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.5 (\nu: 2.7)$             |
| $H_0$                                    | $69.3^{+1.5}_{-1.5}$            | $100\theta_{\mathrm{D}}$              | $0.16083^{+0.00037}_{-0.00037}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.4 (\nu: 1.6)$          |
| $\Omega_{\Lambda}$                       | $0.704^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3383^{+52}_{-51}$              | $\chi_{6\mathrm{DF}}^2$     | $0.10 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}}$                    | $0.296^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00016}_{-0.00016}$ | $\chi_{\mathrm{MGS}}^2$     | $2.47 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1422^{+0.0022}_{-0.0021}$    | $100\theta_{\mathrm{eq}}$             | $0.8167^{+0.0097}_{-0.0097}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.50 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0985^{+0.0027}_{-0.0027}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4512^{+0.0050}_{-0.0050}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\sigma_8$                               | $0.824^{+0.024}_{-0.024}$       | $H(0.15)$                             | $73.91^{+0.97}_{-0.95}$         | $\chi_{\mathrm{BAO}}^2$     | $7.1 (\nu: 0.7)$             |
| $S_8$                                    | $0.819^{+0.026}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$                | $629^{+11}_{-11}$               | $\chi_{\mathrm{CMB}}^2$     | $11933.9 (\nu: 15.8)$        |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12991.69; R - 1 = 0.00727$$



14.30 base\_w\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02234^{+0.00029}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.014}_{-0.013}$       | $H(0.51)$                   | $89.72^{+0.48}_{-0.48}$      |
| $\Omega_{\mathrm{c}} h^2$                | $0.1193^{+0.0021}_{-0.0020}$    | $\sigma_8/h^{0.5}$                    | $0.991^{+0.020}_{-0.019}$       | $D_{\mathrm{M}}(0.51)$      | $1961^{+20}_{-20}$           |
| $100\theta_{\mathrm{MC}}$                | $1.04093^{+0.00058}_{-0.00057}$ | $r_{\mathrm{drag}} h$                 | $102.1^{+2.3}_{-2.2}$           | $H(0.61)$                   | $95.16^{+0.49}_{-0.51}$      |
| $\tau$                                   | $0.055^{+0.012}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | $2.442^{+0.043}_{-0.042}$       | $D_{\mathrm{M}}(0.61)$      | $2285^{+20}_{-20}$           |
| $w_0$                                    | $-1.058^{+0.057}_{-0.060}$      | $z_{\mathrm{re}}$                     | $< 8.84$                        | $H(2.33)$                   | $235.2^{+1.1}_{-1.1}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.026}_{-0.024}$       | $10^9 A_{\mathrm{s}}$                 | $2.096^{+0.054}_{-0.050}$       | $D_{\mathrm{M}}(2.33)$      | $5757^{+17}_{-18}$           |
| $n_{\mathrm{s}}$                         | $0.9666^{+0.0079}_{-0.0076}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.020}_{-0.021}$       | $f\sigma_8(0.15)$           | $0.459^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0048}$    | $D_{40}$                              | $1225^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.764^{+0.019}_{-0.019}$    |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{220}$                             | $5723^{+72}_{-76}$              | $f\sigma_8(0.38)$           | $0.483^{+0.015}_{-0.015}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{810}$                             | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.678^{+0.017}_{-0.017}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{1420}$                            | $816.0^{+9.2}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.484^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                            | $230.5^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | $0.634^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.53$                        | $n_{\mathrm{s},0.002}$                | $0.9666^{+0.0079}_{-0.0076}$    | $f\sigma_8(0.61)$           | $0.480^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.26}$          | $Y_{\mathrm{P}}$                      | $0.24538^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.603^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24671^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3044^{+0.0073}_{-0.0074}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.592^{+0.056}_{-0.053}$       | $\sigma_8(2.33)$            | $0.3126^{+0.0064}_{-0.0064}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.763^{+0.043}_{-0.043}$      | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_*$                                 | $1089.90^{+0.47}_{-0.46}$       | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | $r_*$                                 | $144.64^{+0.48}_{-0.47}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04112^{+0.00058}_{-0.00056}$ | $\chi_{\mathrm{lensing}}^2$ | $9.09 (\nu: 0.2)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.893^{+0.046}_{-0.046}$      | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.3)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.81^{+0.62}_{-0.64}$       | $\chi_{\mathrm{lowl}}^2$    | $22.97 (\nu: 0.3)$           |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.32^{+0.50}_{-0.50}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11513.9 (\nu: 15.6)$        |
| $c_{TE}$                                 | $0.9964^{+0.0098}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14060^{+0.00060}_{-0.00062}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.4 (\nu: 2.7)$             |
| $c_{EE}$                                 | $0.9919^{+0.0098}_{-0.0097}$    | $100\theta_{\mathrm{D}}$              | $0.16083^{+0.00038}_{-0.00036}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.4 (\nu: 1.7)$          |
| $H_0$                                    | $69.3^{+1.6}_{-1.5}$            | $z_{\mathrm{eq}}$                     | $3385^{+47}_{-46}$              | $\chi_{6\mathrm{DF}}^2$     | $0.11 (\nu: 0.0)$            |
| $\Omega_{\Lambda}$                       | $0.704^{+0.013}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01033^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{MGS}}^2$     | $2.48 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.296^{+0.014}_{-0.013}$       | $100\theta_{\mathrm{eq}}$             | $0.8164^{+0.0087}_{-0.0087}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.50 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1423^{+0.0019}_{-0.0019}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4510^{+0.0045}_{-0.0045}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0986^{+0.0026}_{-0.0025}$    | $H(0.15)$                             | $73.93^{+0.96}_{-0.95}$         | $\chi_{\mathrm{CMB}}^2$     | $11942.8 (\nu: 16.5)$        |
| $\sigma_8$                               | $0.825^{+0.020}_{-0.021}$       | $D_{\mathrm{M}}(0.15)$                | $629^{+11}_{-11}$               | $\chi_{\mathrm{BAO}}^2$     | $7.1 (\nu: 0.7)$             |
| $S_8$                                    | $0.820^{+0.021}_{-0.020}$       | $H(0.38)$                             | $83.30^{+0.53}_{-0.51}$         |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.449^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$                | $1510^{+18}_{-18}$              |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 13000.46; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -3.08; R - 1 = 0.00765$$



# 15 w+wa

## 15.1 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022192 | $0.02214^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6134   | $0.614^{+0.026}_{-0.028}$       | $D_M(0.38)$                 | 1518.3   | $1516^{+27}_{-28}$           |
| $\Omega_c h^2$              | 0.11995  | $0.1204^{+0.0035}_{-0.0037}$    | $\sigma_8/h^{0.5}$          | 0.9979   | $0.998^{+0.037}_{-0.039}$       | $H(0.51)$                   | 89.84    | $89.90^{+0.99}_{-1.0}$       |
| $100\theta_{MC}$            | 1.04095  | $1.04085^{+0.00089}_{-0.00091}$ | $r_{drag}h$                 | 100.48   | $100.4^{+2.5}_{-2.4}$           | $D_M(0.51)$                 | 1968.9   | $1966^{+32}_{-32}$           |
| $\tau$                      | 0.0590   | $0.052^{+0.016}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.462    | $2.460^{+0.080}_{-0.087}$       | $H(0.61)$                   | 95.32    | $95.30^{+0.87}_{-0.85}$      |
| $w_0$                       | -0.985   | $-0.96^{+0.17}_{-0.16}$         | $z_{re}$                    | 8.18     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2292.9   | $2290^{+34}_{-34}$           |
| $w_a$                       | -0.18    | $-0.34^{+0.69}_{-0.75}$         | $10^9 A_s$                  | 2.109    | $2.088^{+0.068}_{-0.067}$       | $H(2.33)$                   | 235.28   | $235.1^{+1.9}_{-1.9}$        |
| $\ln(10^{10} A_s)$          | 3.0490   | $3.039^{+0.032}_{-0.032}$       | $10^9 A_s e^{-2\tau}$       | 1.8748   | $1.881^{+0.025}_{-0.025}$       | $D_M(2.33)$                 | 5762.3   | $5765^{+25}_{-26}$           |
| $n_s$                       | 0.9649   | $0.964^{+0.010}_{-0.010}$       | $D_{40}$                    | 1225.7   | $1228^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4619   | $0.461^{+0.021}_{-0.023}$    |
| $y_{cal}$                   | 0.99919  | $1.0004^{+0.0048}_{-0.0048}$    | $D_{220}$                   | 5695     | $5704^{+79}_{-78}$              | $\sigma_8(0.15)$            | 0.7620   | $0.762^{+0.031}_{-0.033}$    |
| $A_{100}^{PS}$              | 236.7    | $242^{+50}_{-50}$               | $D_{810}$                   | 2527.2   | $2534^{+26}_{-26}$              | $f\sigma_8(0.38)$           | 0.4830   | $0.483^{+0.025}_{-0.025}$    |
| $A_{143}^{PS}$              | 44.0     | $41^{+20}_{-20}$                | $D_{1420}$                  | 812.3    | $814^{+10}_{-9.8}$              | $\sigma_8(0.38)$            | 0.6758   | $0.676^{+0.028}_{-0.029}$    |
| $A_{217}^{PS}$              | 97.5     | $101^{+30}_{-30}$               | $D_{2000}$                  | 229.24   | $229.6^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | 0.4829   | $0.483^{+0.026}_{-0.027}$    |
| $A_{217}^{CIB}$             | 46.0     | $41^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9649   | $0.964^{+0.010}_{-0.010}$       | $\sigma_8(0.51)$            | 0.6324   | $0.632^{+0.025}_{-0.027}$    |
| $A_{143}^{tSZ}$             | 5.97     | $< 7.38$                        | $Y_P$                       | 0.245322 | $0.24529^{+0.00017}_{-0.00019}$ | $f\sigma_8(0.61)$           | 0.4786   | $0.479^{+0.027}_{-0.027}$    |
| $r_{143 \times 217}^{PS}$   | 0.614    | $0.65^{+0.25}_{-0.25}$          | $Y_P^{BBN}$                 | 0.246649 | $0.24662^{+0.00017}_{-0.00019}$ | $\sigma_8(0.61)$            | 0.6017   | $0.601^{+0.024}_{-0.025}$    |
| $r_{143 \times 217}^{CIB}$  | 0.87     | —                               | $10^5 D/H$                  | 2.619    | $2.631^{+0.077}_{-0.077}$       | $f\sigma_8(2.33)$           | 0.3039   | $0.304^{+0.012}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | 0.35     | —                               | Age/Gyr                     | 13.779   | $13.777^{+0.072}_{-0.066}$      | $\sigma_8(2.33)$            | 0.3115   | $0.3106^{+0.0092}_{-0.0098}$ |
| $A^{kSZ}$                   | 1.2      | —                               | $z_*$                       | 1090.14  | $1090.26^{+0.71}_{-0.71}$       | $f_{2000}^{143}$            | 31.0     | $31^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.010    | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | 144.58   | $144.51^{+0.86}_{-0.82}$        | $f_{2000}^{217}$            | 107.08   | $107.5^{+3.9}_{-4.0}$        |
| $A_{143}^{dust}$            | 0.996    | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$               | 1.04115  | $1.04106^{+0.00088}_{-0.00090}$ | $f_{2000}^{143 \times 217}$ | 32.79    | $33^{+4}_{-4}$               |
| $A_{217}^{dust}$            | 0.954    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.887   | $13.881^{+0.080}_{-0.076}$      | $\chi_{small}^2$            | 397.31   | $396.9 (\nu: 1.3)$           |
| $A_{143 \times 217}^{dust}$ | 0.973    | $1.03^{+0.32}_{-0.32}$          | $z_{drag}$                  | 1059.51  | $1059.42^{+0.86}_{-0.86}$       | $\chi_{lowl}^2$             | 23.37    | $23.4 (\nu: 0.6)$            |
| $c_{100}$                   | 0.99756  | $0.9974^{+0.0021}_{-0.0021}$    | $r_{drag}$                  | 147.30   | $147.25^{+0.86}_{-0.83}$        | $\chi_{CamSpec}^2$          | 7049.3   | $7062.7 (\nu: 14.5)$         |
| $c_{217}$                   | 1.00160  | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | 0.14050  | $0.14052^{+0.00098}_{-0.00096}$ | $\chi_{JLA}^2$              | 1034.74  | $1035.9 (\nu: 1.2)$          |
| $H_0$                       | 68.21    | $68.2^{+1.7}_{-1.6}$            | $100\theta_D$               | 0.16101  | $0.16107^{+0.00050}_{-0.00050}$ | $\chi_{6DF}^2$              | 0.000    | $0.056 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | 0.6931   | $0.692^{+0.016}_{-0.016}$       | $z_{eq}$                    | 3397     | $3406^{+80}_{-85}$              | $\chi_{MGS}^2$              | 1.75     | $1.92 (\nu: 0.3)$            |
| $\Omega_m$                  | 0.3069   | $0.308^{+0.016}_{-0.016}$       | $k_{eq}$                    | 0.010367 | $0.01040^{+0.00024}_{-0.00026}$ | $\chi_{DR12BAO}^2$          | 3.97     | $4.9 (\nu: 0.9)$             |
| $\Omega_m h^2$              | 0.14278  | $0.1432^{+0.0034}_{-0.0035}$    | $100\theta_{eq}$            | 0.8138   | $0.812^{+0.016}_{-0.015}$       | $\chi_{prior}^2$            | 2.5      | $7.6 (\nu: 5.8)$             |
| $\Omega_m h^3$              | 0.09739  | $0.0976^{+0.0034}_{-0.0034}$    | $100\theta_{s,eq}$          | 0.4498   | $0.4489^{+0.0082}_{-0.0076}$    | $\chi_{BAO}^2$              | 5.72     | $6.9 (\nu: 1.2)$             |
| $\sigma_8$                  | 0.8241   | $0.824^{+0.034}_{-0.036}$       | $H(0.15)$                   | 73.49    | $73.7^{+1.5}_{-1.4}$            | $\chi_{CMB}^2$              | 7470.0   | $7483.0 (\nu: 14.6)$         |
| $S_8$                       | 0.8335   | $0.835^{+0.039}_{-0.041}$       | $D_M(0.15)$                 | 635.6    | $635^{+13}_{-13}$               |                             |          |                              |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4565   | $0.457^{+0.021}_{-0.023}$       | $H(0.38)$                   | 83.32    | $83.5^{+1.2}_{-1.2}$            |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8512.97$ ;  $\bar{\chi}_{eff}^2 = 8533.43$ ;  $R - 1 = 0.00675$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.00 MGS: 1.75 DR12BAO: 3.97 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 397.31 commander\_dx12\_v3.2.29: 23.37 CamSpec like\_10.7HM: 7049.34  
SN - JLA Pantheon18: 1034.74



## 15.2 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02215^{+0.00039}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.612^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | $1516^{+26}_{-27}$           |
| $\Omega_c h^2$                       | $0.1201^{+0.0026}_{-0.0027}$    | $\sigma_8/h^{0.5}$          | $0.995^{+0.023}_{-0.024}$       | $H(0.51)$                   | $89.93^{+0.99}_{-1.0}$       |
| $100\theta_{MC}$                     | $1.04086^{+0.00085}_{-0.00089}$ | $r_{\text{drag}} h$         | $100.5^{+2.5}_{-2.4}$           | $D_M(0.51)$                 | $1966^{+30}_{-31}$           |
| $\tau$                               | $0.052^{+0.016}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | $2.454^{+0.051}_{-0.054}$       | $H(0.61)$                   | $95.34^{+0.86}_{-0.85}$      |
| $w_0$                                | $-0.96^{+0.16}_{-0.15}$         | $z_{\text{re}}$             | $7.5^{+1.5}_{-1.7}$             | $D_M(0.61)$                 | $2289^{+32}_{-33}$           |
| $w_a$                                | $-0.30^{+0.60}_{-0.64}$         | $10^9 A_s$                  | $2.086^{+0.063}_{-0.062}$       | $H(2.33)$                   | $235.0^{+2.0}_{-1.9}$        |
| $\ln(10^{10} A_s)$                   | $3.038^{+0.030}_{-0.030}$       | $10^9 A_s e^{-2\tau}$       | $1.880^{+0.021}_{-0.021}$       | $D_M(2.33)$                 | $5764^{+25}_{-25}$           |
| $n_s$                                | $0.9643^{+0.0088}_{-0.0088}$    | $D_{40}$                    | $1227^{+23}_{-24}$              | $f\sigma_8(0.15)$           | $0.460^{+0.015}_{-0.015}$    |
| $y_{\text{cal}}$                     | $1.0004^{+0.0048}_{-0.0047}$    | $D_{220}$                   | $5706^{+78}_{-79}$              | $\sigma_8(0.15)$            | $0.760^{+0.023}_{-0.023}$    |
| $A_{100}^{\text{PS}}$                | $243^{+50}_{-50}$               | $D_{810}$                   | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.481^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $814^{+10}_{-9.9}$              | $\sigma_8(0.38)$            | $0.674^{+0.020}_{-0.021}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $229.5^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.481^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $n_{s,0.002}$               | $0.9643^{+0.0088}_{-0.0088}$    | $\sigma_8(0.51)$            | $0.631^{+0.019}_{-0.019}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $Y_P$                       | $0.24530^{+0.00016}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.477^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $Y_P^{\text{BBN}}$          | $0.24663^{+0.00016}_{-0.00018}$ | $\sigma_8(0.61)$            | $0.600^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 D/H$                  | $2.627^{+0.074}_{-0.073}$       | $f\sigma_8(2.33)$           | $0.3030^{+0.0088}_{-0.0095}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | Age/Gyr                     | $13.777^{+0.068}_{-0.066}$      | $\sigma_8(2.33)$            | $0.3101^{+0.0071}_{-0.0074}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.21^{+0.62}_{-0.61}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | $144.57^{+0.64}_{-0.64}$        | $f_{2000}^{217}$            | $107.6^{+3.9}_{-3.9}$        |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.35}$          | $100\theta_*$               | $1.04107^{+0.00084}_{-0.00087}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.887^{+0.062}_{-0.061}$      | $\chi_{\text{lensing}}^2$   | $9.40 (\nu: 0.4)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.44^{+0.87}_{-0.84}$       | $\chi_{\text{simall}}^2$    | $396.8 (\nu: 1.2)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | $147.30^{+0.68}_{-0.69}$        | $\chi_{\text{lowl}}^2$      | $23.29 (\nu: 0.4)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | $0.14047^{+0.00087}_{-0.00085}$ | $\chi_{\text{CamSpec}}^2$   | $7062.3 (\nu: 13.6)$         |
| $H_0$                                | $68.2^{+1.7}_{-1.6}$            | $100\theta_D$               | $0.16105^{+0.00051}_{-0.00051}$ | $\chi_{\text{JLA}}^2$       | $1035.9 (\nu: 1.1)$          |
| $\Omega_\Lambda$                     | $0.693^{+0.016}_{-0.016}$       | $z_{\text{eq}}$             | $3400^{+61}_{-62}$              | $\chi_{6\text{DF}}^2$       | $0.056 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.307^{+0.016}_{-0.016}$       | $k_{\text{eq}}$             | $0.01038^{+0.00018}_{-0.00019}$ | $\chi_{\text{MGS}}^2$       | $1.94 (\nu: 0.3)$            |
| $\Omega_m h^2$                       | $0.1429^{+0.0025}_{-0.0026}$    | $100\theta_{\text{eq}}$     | $0.813^{+0.012}_{-0.011}$       | $\chi_{\text{DR12BAO}}^2$   | $4.8 (\nu: 0.8)$             |
| $\Omega_m h^3$                       | $0.0975^{+0.0030}_{-0.0029}$    | $100\theta_{s,\text{eq}}$   | $0.4495^{+0.0059}_{-0.0057}$    | $\chi_{\text{prior}}^2$     | $7.6 (\nu: 5.8)$             |
| $\sigma_8$                           | $0.821^{+0.024}_{-0.024}$       | $H(0.15)$                   | $73.6^{+1.5}_{-1.4}$            | $\chi_{\text{CMB}}^2$       | $7491.9 (\nu: 14.9)$         |
| $S_8$                                | $0.831^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | $635^{+13}_{-13}$               | $\chi_{\text{BAO}}^2$       | $6.8 (\nu: 1.2)$             |
| $\sigma_8 \Omega_m^{0.5}$            | $0.455^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.5^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 8542.20; \Delta \bar{\chi}_{\text{eff}}^2 = 0.70; R - 1 = 0.00753$$



### 15.3 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02214^{+0.00041}_{-0.00039}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.614^{+0.026}_{-0.027}$       | $D_{\mathrm{M}}(0.38)$      | $1516^{+27}_{-27}$           |
| $\Omega_{\mathrm{c}}h^2$               | $0.1203^{+0.0035}_{-0.0037}$    | $\sigma_8/h^{0.5}$                   | $0.998^{+0.036}_{-0.039}$       | $H(0.51)$                   | $89.90^{+0.99}_{-1.0}$       |
| $100\theta_{\mathrm{MC}}$              | $1.04087^{+0.00089}_{-0.00090}$ | $r_{\mathrm{drag}}h$                 | $100.4^{+2.5}_{-2.4}$           | $D_{\mathrm{M}}(0.51)$      | $1966^{+32}_{-32}$           |
| $\tau$                                 | $0.054^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$          | $2.462^{+0.080}_{-0.086}$       | $H(0.61)$                   | $95.31^{+0.87}_{-0.84}$      |
| $w_0$                                  | $-0.96^{+0.17}_{-0.16}$         | $z_{\mathrm{re}}$                    | $< 8.85$                        | $D_{\mathrm{M}}(0.61)$      | $2290^{+34}_{-34}$           |
| $w_{\mathrm{a}}$                       | $-0.33^{+0.68}_{-0.74}$         | $10^9 A_{\mathrm{s}}$                | $2.095^{+0.058}_{-0.054}$       | $H(2.33)$                   | $235.1^{+2.0}_{-1.9}$        |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.042^{+0.028}_{-0.026}$       | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.881^{+0.025}_{-0.025}$       | $D_{\mathrm{M}}(2.33)$      | $5764^{+25}_{-25}$           |
| $n_{\mathrm{s}}$                       | $0.964^{+0.010}_{-0.0099}$      | $D_{40}$                             | $1228^{+27}_{-27}$              | $f\sigma_8(0.15)$           | $0.462^{+0.022}_{-0.022}$    |
| $y_{\mathrm{cal}}$                     | $1.0004^{+0.0048}_{-0.0048}$    | $D_{220}$                            | $5704^{+79}_{-78}$              | $\sigma_8(0.15)$            | $0.762^{+0.031}_{-0.033}$    |
| $A_{100}^{\mathrm{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                            | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.483^{+0.025}_{-0.025}$    |
| $A_{143}^{\mathrm{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                           | $814^{+10}_{-9.7}$              | $\sigma_8(0.38)$            | $0.676^{+0.027}_{-0.029}$    |
| $A_{217}^{\mathrm{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                           | $229.6^{+3.5}_{-3.4}$           | $f\sigma_8(0.51)$           | $0.484^{+0.026}_{-0.026}$    |
| $A_{217}^{\mathrm{CIB}}$               | $41^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$               | $0.964^{+0.010}_{-0.0099}$      | $\sigma_8(0.51)$            | $0.633^{+0.025}_{-0.027}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.40$                        | $Y_{\mathrm{P}}$                     | $0.24530^{+0.00016}_{-0.00019}$ | $f\sigma_8(0.61)$           | $0.480^{+0.027}_{-0.027}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24662^{+0.00017}_{-0.00019}$ | $\sigma_8(0.61)$            | $0.602^{+0.024}_{-0.025}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.629^{+0.075}_{-0.076}$       | $f\sigma_8(2.33)$           | $0.304^{+0.012}_{-0.013}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.777^{+0.073}_{-0.067}$      | $\sigma_8(2.33)$            | $0.3109^{+0.0091}_{-0.0096}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $z_*$                                | $1090.24^{+0.71}_{-0.71}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $r_*$                                | $144.52^{+0.85}_{-0.81}$        | $f_{2000}^{217}$            | $107.5^{+3.9}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$              | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$                        | $1.04107^{+0.00088}_{-0.00089}$ | $f_{2000}^{143\times 217}$  | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.882^{+0.079}_{-0.076}$      | $\chi_{\mathrm{simall}}^2$  | $396.8\ (\nu: 1.3)$          |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.32}$          | $z_{\mathrm{drag}}$                  | $1059.43^{+0.88}_{-0.83}$       | $\chi_{\mathrm{lowl}}^2$    | $23.4\ (\nu: 0.6)$           |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                  | $147.26^{+0.86}_{-0.83}$        | $\chi_{\mathrm{CamSpec}}^2$ | $7062.5\ (\nu: 14.5)$        |
| $c_{217}$                              | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                     | $0.14051^{+0.00098}_{-0.00096}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.9\ (\nu: 1.2)$         |
| $H_0$                                  | $68.2^{+1.7}_{-1.6}$            | $100\theta_{\mathrm{D}}$             | $0.16106^{+0.00050}_{-0.00050}$ | $\chi_{6\mathrm{DF}}^2$     | $0.055\ (\nu: 0.0)$          |
| $\Omega_{\Lambda}$                     | $0.692^{+0.016}_{-0.016}$       | $z_{\mathrm{eq}}$                    | $3404^{+80}_{-84}$              | $\chi_{\mathrm{MGS}}^2$     | $1.91\ (\nu: 0.3)$           |
| $\Omega_{\mathrm{m}}$                  | $0.308^{+0.016}_{-0.016}$       | $k_{\mathrm{eq}}$                    | $0.01039^{+0.00024}_{-0.00026}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.9\ (\nu: 0.9)$            |
| $\Omega_{\mathrm{m}}h^2$               | $0.1431^{+0.0034}_{-0.0035}$    | $100\theta_{\mathrm{eq}}$            | $0.812^{+0.016}_{-0.015}$       | $\chi_{\mathrm{prior}}^2$   | $7.6\ (\nu: 5.8)$            |
| $\Omega_{\mathrm{m}}h^3$               | $0.0976^{+0.0034}_{-0.0034}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4490^{+0.0082}_{-0.0075}$    | $\chi_{\mathrm{BAO}}^2$     | $6.9\ (\nu: 1.2)$            |
| $\sigma_8$                             | $0.824^{+0.034}_{-0.035}$       | $H(0.15)$                            | $73.6^{+1.5}_{-1.4}$            | $\chi_{\mathrm{CMB}}^2$     | $7482.7\ (\nu: 14.3)$        |
| $S_8$                                  | $0.835^{+0.039}_{-0.041}$       | $D_{\mathrm{M}}(0.15)$               | $635^{+13}_{-13}$               |                             |                              |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$    | $0.457^{+0.021}_{-0.023}$       | $H(0.38)$                            | $83.5^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8533.12; R - 1 = 0.00716$$



## 15.4 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02216^{+0.00039}_{-0.00038}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.612^{+0.017}_{-0.017}$       | $D_M(0.38)$                 | $1516^{+26}_{-27}$           |
| $\Omega_c h^2$                       | $0.1200^{+0.0025}_{-0.0026}$    | $\sigma_8/h^{0.5}$          | $0.995^{+0.023}_{-0.024}$       | $H(0.51)$                   | $89.94^{+0.99}_{-1.0}$       |
| $100\theta_{MC}$                     | $1.04089^{+0.00084}_{-0.00087}$ | $r_{\text{drag}} h$         | $100.5^{+2.5}_{-2.4}$           | $D_M(0.51)$                 | $1966^{+31}_{-31}$           |
| $\tau$                               | $0.054^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$ | $2.455^{+0.051}_{-0.053}$       | $H(0.61)$                   | $95.36^{+0.86}_{-0.85}$      |
| $w_0$                                | $-0.96^{+0.16}_{-0.15}$         | $z_{\text{re}}$             | $< 8.79$                        | $D_M(0.61)$                 | $2290^{+33}_{-33}$           |
| $w_a$                                | $-0.29^{+0.59}_{-0.63}$         | $10^9 A_s$                  | $2.092^{+0.054}_{-0.049}$       | $H(2.33)$                   | $235.0^{+2.0}_{-1.9}$        |
| $\ln(10^{10} A_s)$                   | $3.041^{+0.026}_{-0.024}$       | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.021}_{-0.021}$       | $D_M(2.33)$                 | $5763^{+25}_{-25}$           |
| $n_s$                                | $0.9647^{+0.0087}_{-0.0085}$    | $D_{40}$                    | $1227^{+23}_{-23}$              | $f\sigma_8(0.15)$           | $0.460^{+0.015}_{-0.015}$    |
| $y_{\text{cal}}$                     | $1.0004^{+0.0048}_{-0.0047}$    | $D_{220}$                   | $5706^{+78}_{-79}$              | $\sigma_8(0.15)$            | $0.760^{+0.023}_{-0.023}$    |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $D_{810}$                   | $2533^{+26}_{-25}$              | $f\sigma_8(0.38)$           | $0.481^{+0.018}_{-0.018}$    |
| $A_{143}^{\text{PS}}$                | $41^{+20}_{-20}$                | $D_{1420}$                  | $814^{+10}_{-9.9}$              | $\sigma_8(0.38)$            | $0.674^{+0.020}_{-0.020}$    |
| $A_{217}^{\text{PS}}$                | $101^{+30}_{-30}$               | $D_{2000}$                  | $229.6^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.481^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | $41^{+10}_{-10}$                | $n_{s,0.002}$               | $0.9647^{+0.0087}_{-0.0085}$    | $\sigma_8(0.51)$            | $0.631^{+0.019}_{-0.019}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.42$                        | $Y_P$                       | $0.24531^{+0.00016}_{-0.00017}$ | $f\sigma_8(0.61)$           | $0.477^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.24}$          | $Y_P^{\text{BBN}}$          | $0.24663^{+0.00016}_{-0.00017}$ | $\sigma_8(0.61)$            | $0.600^{+0.018}_{-0.018}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $10^5 D/H$                  | $2.625^{+0.073}_{-0.072}$       | $f\sigma_8(2.33)$           | $0.3032^{+0.0089}_{-0.0094}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | Age/Gyr                     | $13.777^{+0.068}_{-0.067}$      | $\sigma_8(2.33)$            | $0.3104^{+0.0070}_{-0.0071}$ |
| $A^{\text{kSZ}}$                     | —                               | $z_*$                       | $1090.18^{+0.60}_{-0.60}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | $144.60^{+0.63}_{-0.63}$        | $f_{2000}^{217}$            | $107.5^{+3.9}_{-3.9}$        |
| $A_{143}^{\text{dust}}$              | $0.98^{+0.34}_{-0.35}$          | $100\theta_*$               | $1.04109^{+0.00083}_{-0.00086}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | $13.889^{+0.061}_{-0.061}$      | $\chi^2_{\text{lensing}}$   | $9.39 (\nu: 0.4)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $z_{\text{drag}}$           | $1059.45^{+0.86}_{-0.82}$       | $\chi^2_{\text{simall}}$    | $396.7 (\nu: 1.1)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\text{drag}}$           | $147.33^{+0.67}_{-0.67}$        | $\chi^2_{\text{lowl}}$      | $23.26 (\nu: 0.4)$           |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | $0.14046^{+0.00086}_{-0.00084}$ | $\chi^2_{\text{CamSpec}}$   | $7062.2 (\nu: 13.6)$         |
| $H_0$                                | $68.2^{+1.7}_{-1.6}$            | $100\theta_D$               | $0.16104^{+0.00050}_{-0.00051}$ | $\chi^2_{\text{JLA}}$       | $1035.9 (\nu: 1.1)$          |
| $\Omega_\Lambda$                     | $0.693^{+0.016}_{-0.016}$       | $z_{\text{eq}}$             | $3397^{+58}_{-61}$              | $\chi^2_{6\text{DF}}$       | $0.055 (\nu: 0.0)$           |
| $\Omega_m$                           | $0.307^{+0.016}_{-0.016}$       | $k_{\text{eq}}$             | $0.01037^{+0.00018}_{-0.00018}$ | $\chi^2_{\text{MGS}}$       | $1.94 (\nu: 0.3)$            |
| $\Omega_m h^2$                       | $0.1428^{+0.0024}_{-0.0025}$    | $100\theta_{\text{eq}}$     | $0.814^{+0.011}_{-0.011}$       | $\chi^2_{\text{DR12BAO}}$   | $4.8 (\nu: 0.8)$             |
| $\Omega_m h^3$                       | $0.0974^{+0.0030}_{-0.0029}$    | $100\theta_{s,\text{eq}}$   | $0.4498^{+0.0058}_{-0.0055}$    | $\chi^2_{\text{prior}}$     | $7.7 (\nu: 5.9)$             |
| $\sigma_8$                           | $0.822^{+0.024}_{-0.024}$       | $H(0.15)$                   | $73.6^{+1.5}_{-1.4}$            | $\chi^2_{\text{CMB}}$       | $7491.6 (\nu: 14.5)$         |
| $S_8$                                | $0.831^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | $635^{+13}_{-13}$               | $\chi^2_{\text{BAO}}$       | $6.8 (\nu: 1.2)$             |
| $\sigma_8 \Omega_m^{0.5}$            | $0.455^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.5^{+1.3}_{-1.2}$            |                             |                              |

$$\bar{\chi}^2_{\text{eff}} = 8541.86; \Delta\bar{\chi}^2_{\text{eff}} = 0.51; R - 1 = 0.00901$$



## 15.5 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18

| Parameter                            | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|--------------------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$                       | 0.022301 | $0.02229^{+0.00031}_{-0.00030}$ | $S_8$                       | 0.8238   | $0.825^{+0.029}_{-0.029}$       | $D_M(0.15)$                 | 635.1    | $635^{+13}_{-13}$            |
| $\Omega_c h^2$                       | 0.11951  | $0.1196^{+0.0025}_{-0.0025}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4512   | $0.452^{+0.016}_{-0.016}$       | $H(0.38)$                   | 83.49    | $83.5^{+1.2}_{-1.3}$         |
| $100\theta_{MC}$                     | 1.04091  | $1.04088^{+0.00060}_{-0.00061}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6066   | $0.607^{+0.019}_{-0.020}$       | $D_M(0.38)$                 | 1516.1   | $1516^{+27}_{-26}$           |
| $\tau$                               | 0.0520   | $0.052^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | 0.9874   | $0.989^{+0.028}_{-0.029}$       | $H(0.51)$                   | 90.02    | $90.0^{+1.0}_{-1.0}$         |
| $w_0$                                | -0.972   | $-0.97^{+0.17}_{-0.16}$         | $r_{\text{drag}} h$         | 100.48   | $100.5^{+2.5}_{-2.4}$           | $D_M(0.51)$                 | 1965.8   | $1966^{+31}_{-31}$           |
| $w_a$                                | -0.20    | $-0.24^{+0.60}_{-0.62}$         | $\langle d^2 \rangle^{1/2}$ | 2.439    | $2.442^{+0.063}_{-0.065}$       | $H(0.61)$                   | 95.49    | $95.45^{+0.84}_{-0.84}$      |
| $\ln(10^{10} A_s)$                   | 3.0366   | $3.038^{+0.032}_{-0.033}$       | $z_{\text{re}}$             | 7.44     | $7.5^{+1.5}_{-1.7}$             | $D_M(0.61)$                 | 2289.2   | $2289^{+34}_{-33}$           |
| $n_s$                                | 0.9662   | $0.9659^{+0.0084}_{-0.0083}$    | $10^9 A_s$                  | 2.083    | $2.086^{+0.067}_{-0.067}$       | $H(2.33)$                   | 235.13   | $235.1^{+2.0}_{-1.9}$        |
| $y_{\text{cal}}$                     | 1.00032  | $1.0005^{+0.0051}_{-0.0049}$    | $10^9 A_s e^{-2\tau}$       | 1.8777   | $1.878^{+0.023}_{-0.022}$       | $D_M(2.33)$                 | 5757.1   | $5759^{+22}_{-21}$           |
| $A_{100}^{\text{PS}}$                | 234.8    | $240^{+50}_{-50}$               | $D_{40}$                    | 1224.2   | $1225^{+25}_{-24}$              | $f\sigma_8(0.15)$           | 0.4557   | $0.456^{+0.016}_{-0.017}$    |
| $A_{143}^{\text{PS}}$                | 38.1     | $40^{+20}_{-20}$                | $D_{220}$                   | 5717     | $5718^{+77}_{-75}$              | $\sigma_8(0.15)$            | 0.7541   | $0.755^{+0.026}_{-0.026}$    |
| $A_{217}^{\text{PS}}$                | 101.6    | $102^{+30}_{-30}$               | $D_{810}$                   | 2534.1   | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | 0.4765   | $0.477^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{CIB}}$               | 44.8     | $40^{+10}_{-10}$                | $D_{1420}$                  | 815.5    | $815.5^{+9.8}_{-9.4}$           | $\sigma_8(0.38)$            | 0.6691   | $0.670^{+0.023}_{-0.023}$    |
| $A_{143}^{\text{tSZ}}$               | 6.65     | $< 7.43$                        | $D_{2000}$                  | 230.22   | $230.2^{+3.3}_{-3.2}$           | $f\sigma_8(0.51)$           | 0.4766   | $0.477^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\text{PS}}$     | 0.573    | $0.66^{+0.25}_{-0.25}$          | $n_{s,0.002}$               | 0.9662   | $0.9659^{+0.0084}_{-0.0083}$    | $\sigma_8(0.51)$            | 0.6263   | $0.627^{+0.021}_{-0.022}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | 0.77     | —                               | $Y_P$                       | 0.245367 | $0.24536^{+0.00012}_{-0.00013}$ | $f\sigma_8(0.61)$           | 0.4725   | $0.473^{+0.021}_{-0.020}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | 0.01     | —                               | $Y_P^{\text{BBN}}$          | 0.246694 | $0.24669^{+0.00012}_{-0.00013}$ | $\sigma_8(0.61)$            | 0.5960   | $0.597^{+0.020}_{-0.020}$    |
| $A^{\text{kSZ}}$                     | 0.0      | —                               | $10^5 D/H$                  | 2.599    | $2.600^{+0.057}_{-0.056}$       | $f\sigma_8(2.33)$           | 0.3011   | $0.301^{+0.010}_{-0.011}$    |
| $A_{100}^{\text{dust}}$              | 1.006    | $1.01^{+0.38}_{-0.38}$          | $\text{Age/Gyr}$            | 13.770   | $13.771^{+0.065}_{-0.060}$      | $\sigma_8(2.33)$            | 0.3089   | $0.3090^{+0.0083}_{-0.0086}$ |
| $A_{143}^{\text{dust}}$              | 0.978    | $0.96^{+0.35}_{-0.35}$          | $z_*$                       | 1089.97  | $1089.98^{+0.52}_{-0.53}$       | $f_{2000}^{143}$            | 30.1     | $30^{+6}_{-6}$               |
| $A_{217}^{\text{dust}}$              | 0.968    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.61   | $144.59^{+0.59}_{-0.58}$        | $f_{2000}^{217}$            | 106.86   | $106.9^{+3.8}_{-3.8}$        |
| $A_{143 \times 217}^{\text{dust}}$   | 1.003    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04110  | $1.04107^{+0.00059}_{-0.00060}$ | $f_{2000}^{143 \times 217}$ | 32.13    | $32^{+4}_{-4}$               |
| $c_{100}$                            | 0.99760  | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.890   | $13.889^{+0.055}_{-0.054}$      | $\chi_{\text{small}}^2$     | 395.76   | $396.9 (\nu: 1.2)$           |
| $c_{217}$                            | 1.00127  | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | 1059.74  | $1059.73^{+0.62}_{-0.64}$       | $\chi_{\text{lowl}}^2$      | 22.92    | $23.05 (\nu: 0.4)$           |
| $c_{TE}$                             | 0.9964   | $0.9965^{+0.0098}_{-0.0096}$    | $r_{\text{drag}}$           | 147.30   | $147.28^{+0.59}_{-0.58}$        | $\chi_{\text{CamSpec}}^2$   | 11499.4  | $11514.3 (\nu: 16.0)$        |
| $c_{EE}$                             | 0.9921   | $0.9921^{+0.0099}_{-0.0098}$    | $k_D$                       | 0.14060  | $0.14060^{+0.00066}_{-0.00067}$ | $\chi_{\text{JLA}}^2$       | 1034.83  | $1035.9 (\nu: 1.2)$          |
| $H_0$                                | 68.22    | $68.2^{+1.7}_{-1.6}$            | $100\theta_D$               | 0.160868 | $0.16087^{+0.00038}_{-0.00038}$ | $\chi_{6\text{DF}}^2$       | 0.001    | $0.055 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | 0.6939   | $0.693^{+0.015}_{-0.016}$       | $z_{\text{eq}}$             | 3389     | $3391^{+57}_{-57}$              | $\chi_{\text{MGS}}^2$       | 1.82     | $1.91 (\nu: 0.2)$            |
| $\Omega_m$                           | 0.3061   | $0.307^{+0.016}_{-0.015}$       | $k_{\text{eq}}$             | 0.010343 | $0.01035^{+0.00017}_{-0.00017}$ | $\chi_{\text{DR12BAO}}^2$   | 3.77     | $4.7 (\nu: 0.8)$             |
| $\Omega_m h^2$                       | 0.14246  | $0.1425^{+0.0024}_{-0.0024}$    | $100\theta_{\text{eq}}$     | 0.8155   | $0.815^{+0.011}_{-0.011}$       | $\chi_{\text{prior}}^2$     | 2.2      | $7.8 (\nu: 5.9)$             |
| $\Omega_m h^3$                       | 0.09718  | $0.0972^{+0.0029}_{-0.0029}$    | $100\theta_{s,\text{eq}}$   | 0.4506   | $0.4504^{+0.0055}_{-0.0054}$    | $\chi_{\text{BAO}}^2$       | 5.59     | $6.6 (\nu: 1.1)$             |
| $\sigma_8$                           | 0.8155   | $0.816^{+0.028}_{-0.028}$       | $H(0.15)$                   | 73.60    | $73.6^{+1.4}_{-1.4}$            | $\chi_{\text{CMB}}^2$       | 11918.0  | $11934.2 (\nu: 16.6)$        |

Best-fit  $\chi_{\text{eff}}^2 = 12960.67$ ;  $\bar{\chi}_{\text{eff}}^2 = 12984.58$ ;  $R - 1 = 0.00938$   
 $\chi_{\text{eff}}^2$ : BAO - 6DF: 0.00 MGS: 1.82 DR12BAO: 3.77 CMB - simall-100x143.offlike5\_EE\_Aplanck\_B: 395.76 commander\_dx12\_v3\_2\_29: 22.92 CamSpec like\_10.7HM\_1400\_unified: 11499.35 SN - JLA Pantheon18: 1034.83



## 15.6 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02229^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.452^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1515^{+26}_{-26}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1196^{+0.0021}_{-0.0021}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.015}_{-0.014}$       | $H(0.51)$                   | $90.0^{+1.0}_{-1.0}$         |
| $100\theta_{\mathrm{MC}}$                | $1.04087^{+0.00058}_{-0.00059}$ | $\sigma_8/h^{0.5}$                    | $0.989^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.51)$      | $1965^{+30}_{-30}$           |
| $\tau$                                   | $0.053^{+0.015}_{-0.015}$       | $r_{\mathrm{drag}} h$                 | $100.5^{+2.5}_{-2.4}$           | $H(0.61)$                   | $95.47^{+0.84}_{-0.83}$      |
| $w_0$                                    | $-0.96^{+0.16}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$           | $2.444^{+0.047}_{-0.046}$       | $D_{\mathrm{M}}(0.61)$      | $2288^{+33}_{-32}$           |
| $w_{\mathrm{a}}$                         | $-0.25^{+0.55}_{-0.62}$         | $z_{\mathrm{re}}$                     | $7.5^{+1.5}_{-1.6}$             | $H(2.33)$                   | $235.1^{+2.0}_{-1.8}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.039^{+0.029}_{-0.029}$       | $10^9 A_{\mathrm{s}}$                 | $2.088^{+0.061}_{-0.060}$       | $D_{\mathrm{M}}(2.33)$      | $5758^{+21}_{-21}$           |
| $n_{\mathrm{s}}$                         | $0.9657^{+0.0078}_{-0.0077}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.021}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0051}_{-0.0049}$    | $D_{40}$                              | $1226^{+23}_{-22}$              | $\sigma_8(0.15)$            | $0.756^{+0.021}_{-0.021}$    |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{220}$                             | $5720^{+78}_{-75}$              | $f\sigma_8(0.38)$           | $0.478^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{810}$                             | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.671^{+0.019}_{-0.019}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{1420}$                            | $815.5^{+9.7}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.478^{+0.017}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{2000}$                            | $230.2^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$            | $0.628^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.39$                        | $n_{\mathrm{s},0.002}$                | $0.9657^{+0.0078}_{-0.0077}$    | $f\sigma_8(0.61)$           | $0.474^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.24536^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.597^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24669^{+0.00012}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3017^{+0.0087}_{-0.0089}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.600^{+0.056}_{-0.055}$       | $\sigma_8(2.33)$            | $0.3093^{+0.0070}_{-0.0071}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.770^{+0.062}_{-0.060}$      | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $z_*$                                 | $1089.98^{+0.48}_{-0.48}$       | $f_{2000}^{217}$            | $106.9^{+3.8}_{-3.7}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $r_*$                                 | $144.59^{+0.50}_{-0.50}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04106^{+0.00058}_{-0.00059}$ | $\chi_{\mathrm{lensing}}^2$ | $9.19 (\nu: 0.3)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.31}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.888^{+0.048}_{-0.048}$      | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.1)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.73^{+0.66}_{-0.64}$       | $\chi_{\mathrm{lowl}}^2$    | $23.10 (\nu: 0.3)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.28^{+0.52}_{-0.52}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11513.9 (\nu: 15.0)$        |
| $c_{TE}$                                 | $0.9965^{+0.0097}_{-0.0096}$    | $k_{\mathrm{D}}$                      | $0.14061^{+0.00062}_{-0.00063}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.9 (\nu: 1.2)$          |
| $c_{EE}$                                 | $0.9922^{+0.0099}_{-0.0097}$    | $100\theta_{\mathrm{D}}$              | $0.16087^{+0.00038}_{-0.00037}$ | $\chi_{6\mathrm{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $H_0$                                    | $68.2^{+1.7}_{-1.6}$            | $z_{\mathrm{eq}}$                     | $3391^{+49}_{-48}$              | $\chi_{\mathrm{MGS}}^2$     | $1.93 (\nu: 0.2)$            |
| $\Omega_{\Lambda}$                       | $0.694^{+0.015}_{-0.015}$       | $k_{\mathrm{eq}}$                     | $0.01035^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{eq}}$             | $0.8150^{+0.0090}_{-0.0090}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.7)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1426^{+0.0020}_{-0.0020}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4503^{+0.0046}_{-0.0046}$    | $\chi_{\mathrm{CMB}}^2$     | $11942.9 (\nu: 16.5)$        |
| $\Omega_{\mathrm{m}} h^3$                | $0.0973^{+0.0028}_{-0.0027}$    | $H(0.15)$                             | $73.7^{+1.4}_{-1.4}$            | $\chi_{\mathrm{BAO}}^2$     | $6.6 (\nu: 1.1)$             |
| $\sigma_8$                               | $0.817^{+0.022}_{-0.022}$       | $D_{\mathrm{M}}(0.15)$                | $635^{+13}_{-13}$               |                             |                              |
| $S_8$                                    | $0.826^{+0.022}_{-0.022}$       | $H(0.38)$                             | $83.5^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12993.26; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.87; R - 1 = 0.00901$$



# 15.7 base\_w\_wa\_CamSpecHM\_TTTEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02230^{+0.00031}_{-0.00030}$ | $S_8$                                | $0.826^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(0.15)$      | $635^{+13}_{-13}$            |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1195^{+0.0025}_{-0.0025}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.452^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.5^{+1.2}_{-1.3}$         |
| $100\theta_{\mathrm{MC}}$                | $1.04089^{+0.00060}_{-0.00061}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.608^{+0.019}_{-0.019}$       | $D_{\mathrm{M}}(0.38)$      | $1516^{+27}_{-26}$           |
| $\tau$                                   | $0.054^{+0.012}_{-0.011}$       | $\sigma_8/h^{0.5}$                   | $0.990^{+0.027}_{-0.028}$       | $H(0.51)$                   | $90.0^{+1.0}_{-1.0}$         |
| $w_0$                                    | $-0.97^{+0.16}_{-0.16}$         | $r_{\mathrm{drag}}h$                 | $100.5^{+2.5}_{-2.4}$           | $D_{\mathrm{M}}(0.51)$      | $1966^{+31}_{-31}$           |
| $w_{\mathrm{a}}$                         | $-0.23^{+0.58}_{-0.65}$         | $\langle d^2 \rangle^{1/2}$          | $2.445^{+0.061}_{-0.062}$       | $H(0.61)$                   | $95.45^{+0.85}_{-0.85}$      |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.041^{+0.027}_{-0.025}$       | $z_{\mathrm{re}}$                    | $< 8.77$                        | $D_{\mathrm{M}}(0.61)$      | $2289^{+34}_{-33}$           |
| $n_{\mathrm{s}}$                         | $0.9661^{+0.0084}_{-0.0083}$    | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.057}_{-0.052}$       | $H(2.33)$                   | $235.2^{+2.0}_{-1.9}$        |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0050}_{-0.0049}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(2.33)$      | $5759^{+22}_{-21}$           |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $D_{40}$                             | $1225^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                            | $5718^{+77}_{-74}$              | $\sigma_8(0.15)$            | $0.756^{+0.026}_{-0.026}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                            | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.478^{+0.019}_{-0.019}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                           | $815.6^{+9.8}_{-9.4}$           | $\sigma_8(0.38)$            | $0.671^{+0.023}_{-0.023}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.43$                        | $D_{2000}$                           | $230.3^{+3.2}_{-3.2}$           | $f\sigma_8(0.51)$           | $0.478^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.9661^{+0.0084}_{-0.0083}$    | $\sigma_8(0.51)$            | $0.628^{+0.021}_{-0.021}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.24536^{+0.00012}_{-0.00012}$ | $f\sigma_8(0.61)$           | $0.474^{+0.021}_{-0.020}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24669^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.597^{+0.020}_{-0.020}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $10^5 \mathrm{D}/\mathrm{H}$         | $2.599^{+0.056}_{-0.056}$       | $f\sigma_8(2.33)$           | $0.302^{+0.010}_{-0.011}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $\mathrm{Age}/\mathrm{Gyr}$          | $13.772^{+0.065}_{-0.060}$      | $\sigma_8(2.33)$            | $0.3094^{+0.0081}_{-0.0082}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.35}$          | $z_*$                                | $1089.97^{+0.51}_{-0.52}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                | $144.60^{+0.58}_{-0.57}$        | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.7}$        |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                        | $1.04108^{+0.00059}_{-0.00060}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.890^{+0.055}_{-0.053}$      | $\chi_{\mathrm{simall}}^2$  | $396.7 (\nu: 1.2)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                  | $1059.74^{+0.65}_{-0.64}$       | $\chi_{\mathrm{lowl}}^2$    | $23.06 (\nu: 0.4)$           |
| $c_{TE}$                                 | $0.9965^{+0.0098}_{-0.0096}$    | $r_{\mathrm{drag}}$                  | $147.29^{+0.59}_{-0.58}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.2 (\nu: 15.9)$        |
| $c_{EE}$                                 | $0.9921^{+0.0099}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.14060^{+0.00066}_{-0.00067}$ | $\chi_{\mathrm{JLA}}^2$     | $1035.9 (\nu: 1.2)$          |
| $H_0$                                    | $68.2^{+1.7}_{-1.6}$            | $100\theta_{\mathrm{D}}$             | $0.16087^{+0.00038}_{-0.00038}$ | $\chi_{6\mathrm{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.694^{+0.015}_{-0.016}$       | $z_{\mathrm{eq}}$                    | $3390^{+56}_{-56}$              | $\chi_{\mathrm{MGS}}^2$     | $1.90 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.306^{+0.016}_{-0.015}$       | $k_{\mathrm{eq}}$                    | $0.01035^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 0.7)$             |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1425^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.011}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.9)$             |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0972^{+0.0029}_{-0.0029}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4505^{+0.0055}_{-0.0054}$    | $\chi_{\mathrm{BAO}}^2$     | $6.6 (\nu: 1.1)$             |
| $\sigma_8$                               | $0.817^{+0.027}_{-0.027}$       | $H(0.15)$                            | $73.6^{+1.4}_{-1.4}$            | $\chi_{\mathrm{CMB}}^2$     | $11933.9 (\nu: 16.1)$        |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12984.26; R - 1 = 0.00880$$



15.8 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02230^{+0.00030}_{-0.00029}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.452^{+0.012}_{-0.012}$       | $D_{\text{M}}(0.38)$        | $1516^{+26}_{-26}$           |
| $\Omega_{\text{c}}h^2$               | $0.1195^{+0.0021}_{-0.0021}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.608^{+0.015}_{-0.014}$       | $H(0.51)$                   | $90.0^{+1.0}_{-1.0}$         |
| $100\theta_{\text{MC}}$              | $1.04088^{+0.00058}_{-0.00058}$ | $\sigma_8/h^{0.5}$                 | $0.990^{+0.021}_{-0.021}$       | $D_{\text{M}}(0.51)$        | $1965^{+30}_{-30}$           |
| $\tau$                               | $0.054^{+0.012}_{-0.011}$       | $r_{\text{drag}}h$                 | $100.5^{+2.5}_{-2.4}$           | $H(0.61)$                   | $95.48^{+0.84}_{-0.84}$      |
| $w_0$                                | $-0.97^{+0.16}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$        | $2.446^{+0.047}_{-0.046}$       | $D_{\text{M}}(0.61)$        | $2289^{+33}_{-32}$           |
| $w_a$                                | $-0.24^{+0.55}_{-0.60}$         | $z_{\text{re}}$                    | $< 8.77$                        | $H(2.33)$                   | $235.1^{+2.0}_{-1.8}$        |
| $\ln(10^{10}A_{\text{s}})$           | $3.041^{+0.025}_{-0.023}$       | $10^9 A_{\text{s}}$                | $2.093^{+0.053}_{-0.049}$       | $D_{\text{M}}(2.33)$        | $5758^{+22}_{-21}$           |
| $n_{\text{s}}$                       | $0.9660^{+0.0077}_{-0.0076}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.878^{+0.021}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.457^{+0.013}_{-0.013}$    |
| $y_{\text{cal}}$                     | $1.0005^{+0.0051}_{-0.0049}$    | $D_{40}$                           | $1226^{+23}_{-22}$              | $\sigma_8(0.15)$            | $0.756^{+0.021}_{-0.021}$    |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{220}$                          | $5719^{+78}_{-74}$              | $f\sigma_8(0.38)$           | $0.478^{+0.016}_{-0.016}$    |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{810}$                          | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.671^{+0.019}_{-0.019}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{1420}$                         | $815.5^{+9.7}_{-9.5}$           | $f\sigma_8(0.51)$           | $0.478^{+0.017}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{2000}$                         | $230.3^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$            | $0.628^{+0.018}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.39$                        | $n_{\text{s},0.002}$               | $0.9660^{+0.0077}_{-0.0076}$    | $f\sigma_8(0.61)$           | $0.474^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.26}$          | $Y_{\text{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.598^{+0.017}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24669^{+0.00012}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3019^{+0.0087}_{-0.0088}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$           | $2.599^{+0.055}_{-0.055}$       | $\sigma_8(2.33)$            | $0.3096^{+0.0070}_{-0.0070}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                            | $13.770^{+0.062}_{-0.060}$      | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                              | $1089.97^{+0.47}_{-0.48}$       | $f_{2000}^{217}$            | $106.9^{+3.8}_{-3.7}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $r_*$                              | $144.60^{+0.50}_{-0.49}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                      | $1.04107^{+0.00057}_{-0.00058}$ | $\chi_{\text{lensing}}^2$   | $9.16 (\nu: 0.2)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.02^{+0.31}_{-0.32}$          | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.890^{+0.047}_{-0.047}$      | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.1)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$                  | $1059.74^{+0.65}_{-0.61}$       | $\chi_{\text{lowl}}^2$      | $23.09 (\nu: 0.3)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$                  | $147.29^{+0.52}_{-0.51}$        | $\chi_{\text{CamSpec}}^2$   | $11513.8 (\nu: 14.9)$        |
| $c_{TE}$                             | $0.9964^{+0.0098}_{-0.0096}$    | $k_{\text{D}}$                     | $0.14060^{+0.00062}_{-0.00063}$ | $\chi_{\text{JLA}}^2$       | $1035.9 (\nu: 1.2)$          |
| $c_{EE}$                             | $0.9921^{+0.0099}_{-0.0097}$    | $100\theta_{\text{D}}$             | $0.16086^{+0.00038}_{-0.00037}$ | $\chi_{6\text{DF}}^2$       | $0.055 (\nu: 0.0)$           |
| $H_0$                                | $68.2^{+1.7}_{-1.6}$            | $z_{\text{eq}}$                    | $3390^{+48}_{-47}$              | $\chi_{\text{MGS}}^2$       | $1.93 (\nu: 0.2)$            |
| $\Omega_{\Lambda}$                   | $0.694^{+0.015}_{-0.015}$       | $k_{\text{eq}}$                    | $0.01035^{+0.00015}_{-0.00014}$ | $\chi_{\text{DR12BAO}}^2$   | $4.6 (\nu: 0.7)$             |
| $\Omega_{\text{m}}$                  | $0.306^{+0.015}_{-0.015}$       | $100\theta_{\text{eq}}$            | $0.8153^{+0.0088}_{-0.0088}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.7)$             |
| $\Omega_{\text{m}}h^2$               | $0.1425^{+0.0020}_{-0.0020}$    | $100\theta_{\text{s,eq}}$          | $0.4505^{+0.0046}_{-0.0045}$    | $\chi_{\text{CMB}}^2$       | $11942.7 (\nu: 16.1)$        |
| $\Omega_{\text{m}}h^3$               | $0.0972^{+0.0028}_{-0.0027}$    | $H(0.15)$                          | $73.6^{+1.4}_{-1.3}$            | $\chi_{\text{BAO}}^2$       | $6.6 (\nu: 1.1)$             |
| $\sigma_8$                           | $0.818^{+0.022}_{-0.022}$       | $D_{\text{M}}(0.15)$               | $635^{+13}_{-13}$               |                             |                              |
| $S_8$                                | $0.826^{+0.022}_{-0.022}$       | $H(0.38)$                          | $83.5^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 12993.01; \Delta\bar{\chi}_{\text{eff}}^2 = 0.76; R - 1 = 0.00841$$



## 15.9 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022142 | $0.02217^{+0.00041}_{-0.00039}$ | $\sigma_8 \Omega_m^{0.25}$  | 0.6189   | $0.617^{+0.026}_{-0.026}$       | $D_M(0.38)$                 | 1508.8   | $1503^{+25}_{-26}$           |
| $\Omega_c h^2$              | 0.12049  | $0.1205^{+0.0035}_{-0.0035}$    | $\sigma_8/h^{0.5}$          | 1.0059   | $1.003^{+0.037}_{-0.037}$       | $H(0.51)$                   | 89.62    | $89.89^{+0.99}_{-0.97}$      |
| $100\theta_{MC}$            | 1.04093  | $1.04089^{+0.00088}_{-0.00089}$ | $r_{drag}h$                 | 102.03   | $101.9^{+2.2}_{-2.2}$           | $D_M(0.51)$                 | 1960.1   | $1953^{+30}_{-30}$           |
| $\tau$                      | 0.0560   | $0.052^{+0.016}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.476    | $2.467^{+0.080}_{-0.082}$       | $H(0.61)$                   | 95.00    | $95.18^{+0.87}_{-0.83}$      |
| $w_0$                       | -1.045   | $-0.99^{+0.17}_{-0.16}$         | $z_{re}$                    | 7.89     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | 2285.1   | $2277^{+32}_{-32}$           |
| $w_a$                       | -0.13    | $-0.34^{+0.71}_{-0.74}$         | $10^9 A_s$                  | 2.107    | $2.089^{+0.069}_{-0.066}$       | $H(2.33)$                   | 235.19   | $234.8^{+1.9}_{-1.9}$        |
| $\ln(10^{10} A_s)$          | 3.0480   | $3.039^{+0.033}_{-0.032}$       | $10^9 A_s e^{-2\tau}$       | 1.8841   | $1.882^{+0.026}_{-0.025}$       | $D_M(2.33)$                 | 5763.7   | $5761^{+24}_{-25}$           |
| $n_s$                       | 0.9629   | $0.964^{+0.010}_{-0.010}$       | $D_{40}$                    | 1233.5   | $1229^{+28}_{-27}$              | $f\sigma_8(0.15)$           | 0.4675   | $0.464^{+0.021}_{-0.022}$    |
| $y_{cal}$                   | 1.00109  | $1.0004^{+0.0049}_{-0.0049}$    | $D_{220}$                   | 5716     | $5706^{+80}_{-80}$              | $\sigma_8(0.15)$            | 0.7748   | $0.772^{+0.031}_{-0.031}$    |
| $A_{100}^{PS}$              | 249.2    | $242^{+50}_{-50}$               | $D_{810}$                   | 2536.4   | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | 0.4927   | $0.489^{+0.025}_{-0.025}$    |
| $A_{143}^{PS}$              | 40.3     | $41^{+20}_{-20}$                | $D_{1420}$                  | 814.5    | $814^{+10}_{-10}$               | $\sigma_8(0.38)$            | 0.6872   | $0.685^{+0.027}_{-0.027}$    |
| $A_{217}^{PS}$              | 96.7     | $101^{+30}_{-30}$               | $D_{2000}$                  | 229.74   | $229.7^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | 0.4934   | $0.491^{+0.026}_{-0.026}$    |
| $A_{217}^{CIB}$             | 42.7     | $41^{+10}_{-10}$                | $n_{s,0.002}$               | 0.9629   | $0.964^{+0.010}_{-0.010}$       | $\sigma_8(0.51)$            | 0.6429   | $0.641^{+0.025}_{-0.025}$    |
| $A_{143}^{tSZ}$             | 2.99     | $< 7.40$                        | $Y_P$                       | 0.245302 | $0.24531^{+0.00016}_{-0.00019}$ | $f\sigma_8(0.61)$           | 0.4893   | $0.487^{+0.027}_{-0.026}$    |
| $r_{143 \times 217}^{PS}$   | 0.577    | $0.65^{+0.25}_{-0.25}$          | $Y_P^{BBN}$                 | 0.246628 | $0.24663^{+0.00016}_{-0.00019}$ | $\sigma_8(0.61)$            | 0.6115   | $0.610^{+0.023}_{-0.024}$    |
| $r_{143 \times 217}^{CIB}$  | 0.66     | —                               | $10^5 D/H$                  | 2.629    | $2.625^{+0.076}_{-0.075}$       | $f\sigma_8(2.33)$           | 0.3086   | $0.308^{+0.011}_{-0.012}$    |
| $\xi^{tSZ \times CIB}$      | 0.34     | —                               | Age/Gyr                     | 13.767   | $13.754^{+0.066}_{-0.065}$      | $\sigma_8(2.33)$            | 0.3156   | $0.3143^{+0.0090}_{-0.0092}$ |
| $A^{kSZ}$                   | 5.8      | —                               | $z_*$                       | 1090.25  | $1090.23^{+0.70}_{-0.70}$       | $f_{2000}^{143}$            | 31.4     | $31^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.004    | $1.01^{+0.38}_{-0.38}$          | $r_*$                       | 144.48   | $144.46^{+0.83}_{-0.81}$        | $f_{2000}^{217}$            | 107.86   | $107.4^{+3.9}_{-3.9}$        |
| $A_{143}^{dust}$            | 0.980    | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$               | 1.04113  | $1.04109^{+0.00087}_{-0.00088}$ | $f_{2000}^{143 \times 217}$ | 33.10    | $33^{+4}_{-4}$               |
| $A_{217}^{dust}$            | 0.958    | $0.97^{+0.20}_{-0.20}$          | $D_M(z_*)/\text{Gpc}$       | 13.877   | $13.875^{+0.078}_{-0.076}$      | $\chi_{small}^2$            | 396.52   | $396.9 (\nu: 1.4)$           |
| $A_{143 \times 217}^{dust}$ | 0.983    | $1.03^{+0.32}_{-0.31}$          | $z_{drag}$                  | 1059.44  | $1059.50^{+0.85}_{-0.86}$       | $\chi_{lowl}^2$             | 23.60    | $23.4 (\nu: 0.6)$            |
| $c_{100}$                   | 0.99737  | $0.9975^{+0.0021}_{-0.0020}$    | $r_{drag}$                  | 147.22   | $147.18^{+0.85}_{-0.82}$        | $\chi_{CamSpec}^2$          | 7049.0   | $7062.4 (\nu: 14.0)$         |
| $c_{217}$                   | 1.00146  | $1.0012^{+0.0031}_{-0.0031}$    | $k_D$                       | 0.14056  | $0.14061^{+0.00096}_{-0.00096}$ | $\chi_{H073p45}^2$          | 6.22     | $6.6 (\nu: 2.8)$             |
| $H_0$                       | 69.31    | $69.3^{+1.5}_{-1.5}$            | $100\theta_D$               | 0.16106  | $0.16103^{+0.00050}_{-0.00050}$ | $\chi_{JLA}^2$              | 1035.91  | $1036.3 (\nu: 1.5)$          |
| $\Omega_\Lambda$            | 0.7017   | $0.701^{+0.014}_{-0.015}$       | $z_{eq}$                    | 3409     | $3410^{+80}_{-80}$              | $\chi_{6DF}^2$              | 0.065    | $0.14 (\nu: 0.0)$            |
| $\Omega_m$                  | 0.2983   | $0.299^{+0.015}_{-0.014}$       | $k_{eq}$                    | 0.010403 | $0.01041^{+0.00024}_{-0.00024}$ | $\chi_{MGS}^2$              | 2.43     | $2.71 (\nu: 0.3)$            |
| $\Omega_m h^2$              | 0.14328  | $0.1433^{+0.0033}_{-0.0033}$    | $100\theta_{eq}$            | 0.8115   | $0.811^{+0.015}_{-0.015}$       | $\chi_{DR12BAO}^2$          | 4.45     | $5.4 (\nu: 1.0)$             |
| $\Omega_m h^3$              | 0.09931  | $0.0993^{+0.0033}_{-0.0033}$    | $100\theta_{s,eq}$          | 0.4486   | $0.4486^{+0.0077}_{-0.0075}$    | $\chi_{prior}^2$            | 2.6      | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                  | 0.8374   | $0.834^{+0.034}_{-0.034}$       | $H(0.15)$                   | 74.00    | $74.3^{+1.5}_{-1.4}$            | $\chi_{BAO}^2$              | 6.94     | $8.3 (\nu: 2.2)$             |
| $S_8$                       | 0.8350   | $0.833^{+0.039}_{-0.039}$       | $D_M(0.15)$                 | 628.6    | $627^{+12}_{-12}$               | $\chi_{CMB}^2$              | 7469.2   | $7482.7 (\nu: 14.4)$         |
| $\sigma_8 \Omega_m^{0.5}$   | 0.4574   | $0.456^{+0.021}_{-0.021}$       | $H(0.38)$                   | 83.28    | $83.6^{+1.2}_{-1.2}$            |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 8520.89$ ;  $\bar{\chi}_{eff}^2 = 8541.50$ ;  $R - 1 = 0.00869$   
 $\chi_{eff}^2$ : BAO - 6DF: 0.07 MGS: 2.43 DR12BAO: 4.45 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 396.52 commander\_dx12\_v3.2.29: 23.60 CamSpec like\_10.7HM: 7049.04  
Hubble - H073p45: 6.22 SN - JLA Pantheon18: 1035.91



15.10 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02219^{+0.00039}_{-0.00039}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.614^{+0.016}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1504^{+25}_{-25}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1201^{+0.0026}_{-0.0026}$    | $\sigma_8/h^{0.5}$                    | $0.998^{+0.023}_{-0.024}$       | $H(0.51)$                   | $89.9^{+1.0}_{-0.98}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00085}_{-0.00087}$ | $r_{\mathrm{drag}} h$                 | $102.0^{+2.2}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1953^{+29}_{-30}$           |
| $\tau$                                   | $0.052^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$           | $2.457^{+0.052}_{-0.054}$       | $H(0.61)$                   | $95.24^{+0.86}_{-0.83}$      |
| $w_0$                                    | $-0.999^{+0.16}_{-0.15}$        | $z_{\mathrm{re}}$                     | $7.4^{+1.5}_{-1.7}$             | $D_{\mathrm{M}}(0.61)$      | $2277^{+32}_{-32}$           |
| $w_{\mathrm{a}}$                         | $-0.29^{+0.62}_{-0.64}$         | $10^9 A_{\mathrm{s}}$                 | $2.086^{+0.062}_{-0.061}$       | $H(2.33)$                   | $234.7^{+2.0}_{-1.9}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.038^{+0.030}_{-0.030}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.880^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5759^{+24}_{-25}$           |
| $n_{\mathrm{s}}$                         | $0.9645^{+0.0088}_{-0.0088}$    | $D_{40}$                              | $1227^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.461^{+0.015}_{-0.015}$    |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0048}_{-0.0049}$    | $D_{220}$                             | $5708^{+79}_{-80}$              | $\sigma_8(0.15)$            | $0.769^{+0.022}_{-0.022}$    |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{810}$                             | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.486^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.682^{+0.019}_{-0.020}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                            | $229.7^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.488^{+0.019}_{-0.019}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.9645^{+0.0088}_{-0.0088}$    | $\sigma_8(0.51)$            | $0.638^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.47$                        | $Y_{\mathrm{P}}$                      | $0.24532^{+0.00015}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.484^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00016}_{-0.00018}$ | $\sigma_8(0.61)$            | $0.607^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.620^{+0.074}_{-0.072}$       | $f\sigma_8(2.33)$           | $0.3068^{+0.0086}_{-0.0090}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.755^{+0.065}_{-0.064}$      | $\sigma_8(2.33)$            | $0.3134^{+0.0069}_{-0.0069}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.16^{+0.61}_{-0.61}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                                 | $144.55^{+0.66}_{-0.63}$        | $f_{2000}^{217}$            | $107.4^{+4.0}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$                         | $1.04112^{+0.00084}_{-0.00086}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.884^{+0.062}_{-0.061}$      | $\chi_{\mathrm{lensing}}^2$ | $9.36 (\nu: 0.4)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.52^{+0.87}_{-0.85}$       | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.2)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                   | $147.27^{+0.69}_{-0.67}$        | $\chi_{\mathrm{lowl}}^2$    | $23.21 (\nu: 0.4)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.14054^{+0.00084}_{-0.00086}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7062.3 (\nu: 13.2)$         |
| $H_0$                                    | $69.3^{+1.5}_{-1.5}$            | $100\theta_{\mathrm{D}}$              | $0.16101^{+0.00050}_{-0.00050}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.6 (\nu: 2.8)$             |
| $\Omega_{\Lambda}$                       | $0.702^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3400^{+60}_{-61}$              | $\chi_{\mathrm{JLA}}^2$     | $1036.2 (\nu: 1.4)$          |
| $\Omega_{\mathrm{m}}$                    | $0.298^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01038^{+0.00018}_{-0.00019}$ | $\chi_{6\mathrm{DF}}^2$     | $0.14 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1429^{+0.0025}_{-0.0026}$    | $100\theta_{\mathrm{eq}}$             | $0.813^{+0.011}_{-0.011}$       | $\chi_{\mathrm{MGS}}^2$     | $2.72 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0990^{+0.0028}_{-0.0028}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4495^{+0.0059}_{-0.0057}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $5.3 (\nu: 1.0)$             |
| $\sigma_8$                               | $0.830^{+0.023}_{-0.024}$       | $H(0.15)$                             | $74.3^{+1.4}_{-1.3}$            | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.8)$             |
| $S_8$                                    | $0.828^{+0.025}_{-0.026}$       | $D_{\mathrm{M}}(0.15)$                | $627^{+12}_{-12}$               | $\chi_{\mathrm{CMB}}^2$     | $7491.6 (\nu: 14.5)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.453^{+0.014}_{-0.014}$       | $H(0.38)$                             | $83.6^{+1.2}_{-1.2}$            | $\chi_{\mathrm{BAO}}^2$     | $8.2 (\nu: 2.2)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8550.26; \Delta \bar{\chi}_{\mathrm{eff}}^2 = -2.54; R - 1 = 0.01140$$



# 15.11 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02217^{+0.00041}_{-0.00040}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.617^{+0.026}_{-0.026}$       | $D_{\mathrm{M}}(0.38)$      | $1503^{+25}_{-26}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1205^{+0.0035}_{-0.0035}$    | $\sigma_8 / h^{0.5}$                  | $1.004^{+0.036}_{-0.037}$       | $H(0.51)$                   | $89.9^{+1.0}_{-0.97}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04089^{+0.00087}_{-0.00090}$ | $r_{\mathrm{drag}} h$                 | $102.0^{+2.2}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1953^{+30}_{-31}$           |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | $2.469^{+0.080}_{-0.081}$       | $H(0.61)$                   | $95.18^{+0.87}_{-0.83}$      |
| $w_0$                                    | $-0.99^{+0.17}_{-0.16}$         | $z_{\mathrm{re}}$                     | $< 8.83$                        | $D_{\mathrm{M}}(0.61)$      | $2277^{+32}_{-33}$           |
| $w_{\mathrm{a}}$                         | $-0.33^{+0.70}_{-0.74}$         | $10^9 A_{\mathrm{s}}$                 | $2.096^{+0.059}_{-0.053}$       | $H(2.33)$                   | $234.8^{+1.9}_{-1.9}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.028}_{-0.026}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.882^{+0.026}_{-0.025}$       | $D_{\mathrm{M}}(2.33)$      | $5760^{+25}_{-25}$           |
| $n_{\mathrm{s}}$                         | $0.964^{+0.010}_{-0.010}$       | $D_{40}$                              | $1229^{+28}_{-27}$              | $f\sigma_8(0.15)$           | $0.464^{+0.021}_{-0.022}$    |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0049}_{-0.0049}$    | $D_{220}$                             | $5706^{+80}_{-80}$              | $\sigma_8(0.15)$            | $0.773^{+0.031}_{-0.031}$    |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{810}$                             | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.490^{+0.025}_{-0.025}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.686^{+0.027}_{-0.027}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                            | $229.8^{+3.6}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.491^{+0.026}_{-0.026}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.964^{+0.010}_{-0.010}$       | $\sigma_8(0.51)$            | $0.642^{+0.025}_{-0.025}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.41$                        | $Y_{\mathrm{P}}$                      | $0.24531^{+0.00016}_{-0.00019}$ | $f\sigma_8(0.61)$           | $0.488^{+0.027}_{-0.026}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24664^{+0.00016}_{-0.00019}$ | $\sigma_8(0.61)$            | $0.611^{+0.023}_{-0.024}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.624^{+0.077}_{-0.075}$       | $f\sigma_8(2.33)$           | $0.308^{+0.011}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.754^{+0.067}_{-0.065}$      | $\sigma_8(2.33)$            | $0.3147^{+0.0087}_{-0.0090}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.21^{+0.70}_{-0.71}$       | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                                 | $144.47^{+0.83}_{-0.82}$        | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.35}$          | $100\theta_*$                         | $1.04110^{+0.00086}_{-0.00089}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.876^{+0.078}_{-0.077}$      | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.3)$           |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.51^{+0.88}_{-0.87}$       | $\chi_{\mathrm{lowl}}^2$    | $23.4 (\nu: 0.6)$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0020}$    | $r_{\mathrm{drag}}$                   | $147.19^{+0.84}_{-0.83}$        | $\chi_{\mathrm{CamSpec}}^2$ | $7062.3 (\nu: 13.9)$         |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.14060^{+0.00096}_{-0.00097}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.6 (\nu: 2.7)$             |
| $H_0$                                    | $69.3^{+1.5}_{-1.5}$            | $100\theta_{\mathrm{D}}$              | $0.16102^{+0.00050}_{-0.00050}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.3 (\nu: 1.5)$          |
| $\Omega_{\Lambda}$                       | $0.701^{+0.014}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3408^{+80}_{-80}$              | $\chi_{6\mathrm{DF}}^2$     | $0.14 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}}$                    | $0.299^{+0.014}_{-0.014}$       | $k_{\mathrm{eq}}$                     | $0.01040^{+0.00025}_{-0.00024}$ | $\chi_{\mathrm{MGS}}^2$     | $2.70 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1433^{+0.0034}_{-0.0033}$    | $100\theta_{\mathrm{eq}}$             | $0.812^{+0.015}_{-0.015}$       | $\chi_{\mathrm{DR12BAO}}^2$ | $5.4 (\nu: 1.0)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0992^{+0.0033}_{-0.0033}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4487^{+0.0078}_{-0.0076}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.835^{+0.033}_{-0.034}$       | $H(0.15)$                             | $74.3^{+1.5}_{-1.4}$            | $\chi_{\mathrm{BAO}}^2$     | $8.2 (\nu: 2.2)$             |
| $S_8$                                    | $0.833^{+0.039}_{-0.039}$       | $D_{\mathrm{M}}(0.15)$                | $627^{+12}_{-12}$               | $\chi_{\mathrm{CMB}}^2$     | $7482.5 (\nu: 14.0)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.456^{+0.021}_{-0.021}$       | $H(0.38)$                             | $83.6^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8541.22; R - 1 = 0.00801$$



## 15.12 base\_w\_wa\_CamSpecHM\_TT\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02220^{+0.00039}_{-0.00039}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.614^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1504^{+25}_{-25}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1200^{+0.0025}_{-0.0026}$    | $\sigma_8/h^{0.5}$                    | $0.998^{+0.024}_{-0.024}$       | $H(0.51)$                   | $89.9^{+1.0}_{-0.99}$        |
| $100\theta_{\mathrm{MC}}$                | $1.04093^{+0.00085}_{-0.00087}$ | $r_{\mathrm{drag}} h$                 | $102.0^{+2.2}_{-2.2}$           | $D_{\mathrm{M}}(0.51)$      | $1954^{+29}_{-30}$           |
| $\tau$                                   | $0.054^{+0.012}_{-0.011}$       | $\langle d^2 \rangle^{1/2}$           | $2.458^{+0.051}_{-0.053}$       | $H(0.61)$                   | $95.25^{+0.86}_{-0.84}$      |
| $w_0$                                    | $-1.00^{+0.16}_{-0.15}$         | $z_{\mathrm{re}}$                     | $< 8.78$                        | $D_{\mathrm{M}}(0.61)$      | $2278^{+32}_{-32}$           |
| $w_{\mathrm{a}}$                         | $-0.27^{+0.61}_{-0.63}$         | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.054}_{-0.048}$       | $H(2.33)$                   | $234.7^{+2.0}_{-1.9}$        |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.025}_{-0.023}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(2.33)$      | $5759^{+25}_{-25}$           |
| $n_{\mathrm{s}}$                         | $0.9649^{+0.0086}_{-0.0087}$    | $D_{40}$                              | $1227^{+24}_{-23}$              | $f\sigma_8(0.15)$           | $0.461^{+0.015}_{-0.016}$    |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0048}_{-0.0049}$    | $D_{220}$                             | $5708^{+80}_{-80}$              | $\sigma_8(0.15)$            | $0.769^{+0.022}_{-0.022}$    |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $D_{810}$                             | $2533^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.486^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{1420}$                            | $814^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.682^{+0.019}_{-0.020}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{2000}$                            | $229.8^{+3.5}_{-3.5}$           | $f\sigma_8(0.51)$           | $0.488^{+0.019}_{-0.019}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+10}_{-10}$                | $n_{\mathrm{s},0.002}$                | $0.9649^{+0.0086}_{-0.0087}$    | $\sigma_8(0.51)$            | $0.639^{+0.018}_{-0.018}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.50$                        | $Y_{\mathrm{P}}$                      | $0.24532^{+0.00015}_{-0.00018}$ | $f\sigma_8(0.61)$           | $0.484^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.24665^{+0.00016}_{-0.00018}$ | $\sigma_8(0.61)$            | $0.608^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $10^5 \mathrm{D}/\mathrm{H}$          | $2.619^{+0.076}_{-0.072}$       | $f\sigma_8(2.33)$           | $0.3069^{+0.0086}_{-0.0090}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $\mathrm{Age}/\mathrm{Gyr}$           | $13.756^{+0.065}_{-0.064}$      | $\sigma_8(2.33)$            | $0.3137^{+0.0068}_{-0.0067}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.14^{+0.61}_{-0.61}$       | $f_{2000}^{143}$            | $31^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                                 | $144.57^{+0.65}_{-0.62}$        | $f_{2000}^{217}$            | $107.3^{+3.9}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.35}_{-0.35}$          | $100\theta_*$                         | $1.04113^{+0.00084}_{-0.00086}$ | $f_{2000}^{143 \times 217}$ | $33^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.886^{+0.062}_{-0.059}$      | $\chi_{\mathrm{lensing}}^2$ | $9.36 (\nu: 0.5)$            |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.53^{+0.86}_{-0.89}$       | $\chi_{\mathrm{simall}}^2$  | $396.7 (\nu: 1.1)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $r_{\mathrm{drag}}$                   | $147.30^{+0.68}_{-0.66}$        | $\chi_{\mathrm{lowl}}^2$    | $23.19 (\nu: 0.4)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.14052^{+0.00085}_{-0.00086}$ | $\chi_{\mathrm{CamSpec}}^2$ | $7062.2 (\nu: 13.1)$         |
| $H_0$                                    | $69.3^{+1.5}_{-1.5}$            | $100\theta_{\mathrm{D}}$              | $0.16101^{+0.00051}_{-0.00050}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.6 (\nu: 2.7)$             |
| $\Omega_{\Lambda}$                       | $0.702^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3397^{+58}_{-60}$              | $\chi_{\mathrm{JLA}}^2$     | $1036.2 (\nu: 1.4)$          |
| $\Omega_{\mathrm{m}}$                    | $0.298^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01037^{+0.00018}_{-0.00018}$ | $\chi_{6\mathrm{DF}}^2$     | $0.14 (\nu: 0.0)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1428^{+0.0024}_{-0.0025}$    | $100\theta_{\mathrm{eq}}$             | $0.814^{+0.011}_{-0.011}$       | $\chi_{\mathrm{MGS}}^2$     | $2.71 (\nu: 0.3)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.0989^{+0.0028}_{-0.0027}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4498^{+0.0057}_{-0.0055}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $5.3 (\nu: 1.0)$             |
| $\sigma_8$                               | $0.831^{+0.023}_{-0.024}$       | $H(0.15)$                             | $74.3^{+1.4}_{-1.3}$            | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 5.8)$             |
| $S_8$                                    | $0.828^{+0.025}_{-0.026}$       | $D_{\mathrm{M}}(0.15)$                | $628^{+12}_{-12}$               | $\chi_{\mathrm{CMB}}^2$     | $7491.4 (\nu: 14.1)$         |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.453^{+0.014}_{-0.014}$       | $H(0.38)$                             | $83.6^{+1.3}_{-1.2}$            | $\chi_{\mathrm{BAO}}^2$     | $8.1 (\nu: 2.1)$             |

$$\bar{\chi}_{\mathrm{eff}}^2 = 8549.95; \Delta \bar{\chi}_{\mathrm{eff}}^2 = -2.78; R - 1 = 0.01139$$



### 15.13 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022321 | $0.02231^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4501   | $0.451^{+0.016}_{-0.016}$       | $D_M(0.38)$                 | 1503.4   | $1504^{+25}_{-25}$           |
| $\Omega_c h^2$              | 0.11954  | $0.1197^{+0.0025}_{-0.0025}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6100   | $0.610^{+0.019}_{-0.019}$       | $H(0.51)$                   | 90.02    | $90.01^{+0.97}_{-0.98}$      |
| $100\theta_{MC}$            | 1.04091  | $1.04089^{+0.00061}_{-0.00059}$ | $\sigma_8/h^{0.5}$          | 0.9928   | $0.993^{+0.028}_{-0.028}$       | $D_M(0.51)$                 | 1952.7   | $1953^{+30}_{-30}$           |
| $\tau$                      | 0.0528   | $0.052^{+0.015}_{-0.015}$       | $r_{drag}h$                 | 102.09   | $102.0^{+2.2}_{-2.2}$           | $H(0.61)$                   | 95.37    | $95.34^{+0.79}_{-0.80}$      |
| $w_0$                       | -1.010   | $-1.00^{+0.16}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$ | 2.446    | $2.448^{+0.064}_{-0.064}$       | $D_M(0.61)$                 | 2276.3   | $2277^{+33}_{-32}$           |
| $w_a$                       | -0.20    | $-0.24^{+0.60}_{-0.64}$         | $z_{re}$                    | 7.51     | $7.5^{+1.5}_{-1.6}$             | $H(2.33)$                   | 234.70   | $234.8^{+1.9}_{-1.8}$        |
| $\ln(10^{10} A_s)$          | 3.0385   | $3.038^{+0.032}_{-0.032}$       | $10^9 A_s$                  | 2.087    | $2.087^{+0.067}_{-0.065}$       | $D_M(2.33)$                 | 5753.5   | $5755^{+21}_{-20}$           |
| $n_s$                       | 0.9666   | $0.9658^{+0.0084}_{-0.0084}$    | $10^9 A_s e^{-2\tau}$       | 1.8782   | $1.879^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$           | 0.4582   | $0.458^{+0.016}_{-0.016}$    |
| $y_{cal}$                   | 1.00031  | $1.0004^{+0.0050}_{-0.0048}$    | $D_{40}$                    | 1223.5   | $1225^{+25}_{-24}$              | $\sigma_8(0.15)$            | 0.7652   | $0.765^{+0.025}_{-0.025}$    |
| $A_{100}^{PS}$              | 232.2    | $239^{+50}_{-50}$               | $D_{220}$                   | 5717     | $5719^{+76}_{-76}$              | $f\sigma_8(0.38)$           | 0.4829   | $0.483^{+0.019}_{-0.019}$    |
| $A_{143}^{PS}$              | 42.0     | $39^{+20}_{-20}$                | $D_{810}$                   | 2535.0   | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | 0.6793   | $0.679^{+0.022}_{-0.023}$    |
| $A_{217}^{PS}$              | 103.0    | $103^{+30}_{-30}$               | $D_{1420}$                  | 816.0    | $815.6^{+9.6}_{-9.4}$           | $f\sigma_8(0.51)$           | 0.4842   | $0.484^{+0.020}_{-0.020}$    |
| $A_{217}^{CIB}$             | 43.7     | $40^{+10}_{-10}$                | $D_{2000}$                  | 230.48   | $230.3^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$            | 0.6359   | $0.636^{+0.020}_{-0.021}$    |
| $A_{143}^{tSZ}$             | 6.62     | $< 7.46$                        | $n_{s,0.002}$               | 0.9666   | $0.9658^{+0.0084}_{-0.0084}$    | $f\sigma_8(0.61)$           | 0.4806   | $0.481^{+0.020}_{-0.020}$    |
| $r_{143 \times 217}^{PS}$   | 0.642    | $0.66^{+0.25}_{-0.25}$          | $Y_P$                       | 0.245376 | $0.24537^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | 0.6051   | $0.605^{+0.019}_{-0.020}$    |
| $r_{143 \times 217}^{CIB}$  | 0.79     | —                               | $Y_P^{BBN}$                 | 0.246702 | $0.24670^{+0.00012}_{-0.00012}$ | $f\sigma_8(2.33)$           | 0.3057   | $0.3055^{+0.0098}_{-0.011}$  |
| $\xi^{tSZ \times CIB}$      | 0.28     | —                               | $10^5 D/H$                  | 2.595    | $2.597^{+0.056}_{-0.055}$       | $\sigma_8(2.33)$            | 0.3129   | $0.3126^{+0.0079}_{-0.0082}$ |
| $A^{kSZ}$                   | 0.0      | —                               | Age/Gyr                     | 13.748   | $13.749^{+0.061}_{-0.058}$      | $f_{2000}^{143}$            | 29.7     | $30^{+6}_{-6}$               |
| $A_{100}^{dust}$            | 1.006    | $1.01^{+0.39}_{-0.38}$          | $z_*$                       | 1089.94  | $1089.96^{+0.52}_{-0.53}$       | $f_{2000}^{217}$            | 106.53   | $106.8^{+3.8}_{-3.8}$        |
| $A_{143}^{dust}$            | 0.972    | $0.96^{+0.34}_{-0.34}$          | $r_*$                       | 144.59   | $144.56^{+0.57}_{-0.58}$        | $f_{2000}^{143 \times 217}$ | 31.92    | $32^{+4}_{-4}$               |
| $A_{217}^{dust}$            | 0.972    | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$               | 1.04109  | $1.04108^{+0.00060}_{-0.00059}$ | $\chi_{small}^2$            | 395.84   | $396.8 (\nu: 1.2)$           |
| $A_{143 \times 217}^{dust}$ | 1.011    | $1.03^{+0.32}_{-0.32}$          | $D_M(z_*)/\text{Gpc}$       | 13.888   | $13.886^{+0.053}_{-0.054}$      | $\chi_{lowl}^2$             | 22.83    | $23.03 (\nu: 0.4)$           |
| $c_{100}$                   | 0.99770  | $0.9975^{+0.0021}_{-0.0021}$    | $z_{drag}$                  | 1059.78  | $1059.78^{+0.65}_{-0.65}$       | $\chi_{CamSpec}^2$          | 11499.2  | $11514.1 (\nu: 15.6)$        |
| $c_{217}$                   | 1.00127  | $1.0011^{+0.0031}_{-0.0030}$    | $r_{drag}$                  | 147.27   | $147.24^{+0.58}_{-0.59}$        | $\chi_{H073p45}^2$          | 6.18     | $6.6 (\nu: 2.7)$             |
| $c_{TE}$                    | 0.9962   | $0.9963^{+0.0096}_{-0.0096}$    | $k_D$                       | 0.14064  | $0.14066^{+0.00067}_{-0.00067}$ | $\chi_{JLA}^2$              | 1035.34  | $1036.1 (\nu: 1.3)$          |
| $c_{EE}$                    | 0.9916   | $0.9917^{+0.0098}_{-0.0096}$    | $100\theta_D$               | 0.160838 | $0.16085^{+0.00037}_{-0.00037}$ | $\chi_{6DF}^2$              | 0.098    | $0.14 (\nu: 0.0)$            |
| $H_0$                       | 69.32    | $69.3^{+1.5}_{-1.5}$            | $z_{eq}$                    | 3390     | $3393^{+57}_{-56}$              | $\chi_{MGS}^2$              | 2.67     | $2.70 (\nu: 0.3)$            |
| $\Omega_\Lambda$            | 0.7035   | $0.703^{+0.013}_{-0.014}$       | $k_{eq}$                    | 0.010347 | $0.01036^{+0.00017}_{-0.00017}$ | $\chi_{DR12BAO}^2$          | 4.36     | $5.2 (\nu: 0.9)$             |
| $\Omega_m$                  | 0.2965   | $0.297^{+0.014}_{-0.013}$       | $100\theta_{eq}$            | 0.8153   | $0.815^{+0.011}_{-0.011}$       | $\chi_{prior}^2$            | 2.1      | $7.8 (\nu: 5.7)$             |
| $\Omega_m h^2$              | 0.14251  | $0.1426^{+0.0024}_{-0.0024}$    | $100\theta_{s,eq}$          | 0.4505   | $0.4502^{+0.0055}_{-0.0055}$    | $\chi_{BAO}^2$              | 7.13     | $8.0 (\nu: 2.1)$             |
| $\Omega_m h^3$              | 0.09879  | $0.0988^{+0.0027}_{-0.0027}$    | $H(0.15)$                   | 74.27    | $74.3^{+1.4}_{-1.4}$            | $\chi_{CMB}^2$              | 11917.9  | $11933.9 (\nu: 16.1)$        |
| $\sigma_8$                  | 0.8266   | $0.827^{+0.026}_{-0.027}$       | $D_M(0.15)$                 | 627.2    | $628^{+12}_{-12}$               |                             |          |                              |
| $S_8$                       | 0.8218   | $0.823^{+0.029}_{-0.029}$       | $H(0.38)$                   | 83.69    | $83.7^{+1.2}_{-1.2}$            |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 12968.70$ ;  $\bar{\chi}_{eff}^2 = 12992.43$ ;  $R - 1 = 0.01047$

$\chi_{eff}^2$ : BAO - 6DF: 0.10 MGS: 2.67 DR12BAO: 4.36 CMB - small\_100x143\_offlike5\_EE\_Aplanck\_B: 395.84 commander\_dx12\_v3\_2\_29: 22.83 CamSpec like\_10.7HM\_1400\_unified: 11499.24 Hubble - H073p45: 6.18 SN - JLA Pantheon18: 1035.34



## 15.14 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                          | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\text{b}}h^2$               | $0.02232^{+0.00029}_{-0.00029}$ | $\sigma_8\Omega_{\text{m}}^{0.5}$  | $0.451^{+0.012}_{-0.012}$       | $D_{\text{M}}(0.38)$        | $1503^{+25}_{-25}$           |
| $\Omega_{\text{c}}h^2$               | $0.1196^{+0.0021}_{-0.0021}$    | $\sigma_8\Omega_{\text{m}}^{0.25}$ | $0.610^{+0.014}_{-0.015}$       | $H(0.51)$                   | $90.03^{+0.96}_{-0.98}$      |
| $100\theta_{\text{MC}}$              | $1.04089^{+0.00060}_{-0.00058}$ | $\sigma_8/h^{0.5}$                 | $0.993^{+0.021}_{-0.021}$       | $D_{\text{M}}(0.51)$        | $1952^{+30}_{-30}$           |
| $\tau$                               | $0.053^{+0.014}_{-0.014}$       | $r_{\text{drag}}h$                 | $102.0^{+2.2}_{-2.2}$           | $H(0.61)$                   | $95.37^{+0.78}_{-0.79}$      |
| $w_0$                                | $-1.00^{+0.15}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$        | $2.448^{+0.047}_{-0.047}$       | $D_{\text{M}}(0.61)$        | $2276^{+32}_{-32}$           |
| $w_{\text{a}}$                       | $-0.24^{+0.57}_{-0.60}$         | $z_{\text{re}}$                    | $7.5^{+1.4}_{-1.5}$             | $H(2.33)$                   | $234.7^{+1.9}_{-1.8}$        |
| $\ln(10^{10}A_{\text{s}})$           | $3.038^{+0.028}_{-0.028}$       | $10^9 A_{\text{s}}$                | $2.087^{+0.060}_{-0.058}$       | $D_{\text{M}}(2.33)$        | $5754^{+21}_{-20}$           |
| $n_{\text{s}}$                       | $0.9657^{+0.0080}_{-0.0079}$    | $10^9 A_{\text{s}}e^{-2\tau}$      | $1.879^{+0.021}_{-0.021}$       | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $y_{\text{cal}}$                     | $1.0004^{+0.0050}_{-0.0048}$    | $D_{40}$                           | $1226^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.765^{+0.020}_{-0.020}$    |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $D_{220}$                          | $5721^{+75}_{-75}$              | $f\sigma_8(0.38)$           | $0.483^{+0.016}_{-0.016}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{810}$                          | $2535^{+26}_{-25}$              | $\sigma_8(0.38)$            | $0.679^{+0.018}_{-0.018}$    |
| $A_{217}^{\text{PS}}$                | $103^{+30}_{-30}$               | $D_{1420}$                         | $815.6^{+9.6}_{-9.3}$           | $f\sigma_8(0.51)$           | $0.484^{+0.016}_{-0.016}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{2000}$                         | $230.3^{+3.2}_{-3.1}$           | $\sigma_8(0.51)$            | $0.636^{+0.017}_{-0.017}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.38$                        | $n_{\text{s},0.002}$               | $0.9657^{+0.0080}_{-0.0079}$    | $f\sigma_8(0.61)$           | $0.481^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.25}_{-0.25}$          | $Y_{\text{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.605^{+0.016}_{-0.016}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_{\text{P}}^{\text{BBN}}$        | $0.24670^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3057^{+0.0082}_{-0.0086}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $10^5 \text{D}/\text{H}$           | $2.596^{+0.054}_{-0.054}$       | $\sigma_8(2.33)$            | $0.3127^{+0.0067}_{-0.0068}$ |
| $A^{\text{kSZ}}$                     | —                               | $\text{Age}/\text{Gyr}$            | $13.748^{+0.060}_{-0.056}$      | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                              | $1089.96^{+0.48}_{-0.49}$       | $f_{2000}^{217}$            | $106.8^{+3.7}_{-3.8}$        |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $r_*$                              | $144.57^{+0.50}_{-0.49}$        | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$                      | $1.04108^{+0.00060}_{-0.00058}$ | $\chi_{\text{lensing}}^2$   | $9.13 (\nu: 0.2)$            |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $D_{\text{M}}(z_*)/\text{Gpc}$     | $13.886^{+0.047}_{-0.047}$      | $\chi_{\text{simall}}^2$    | $396.7 (\nu: 1.0)$           |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$                  | $1059.79^{+0.60}_{-0.62}$       | $\chi_{\text{lowl}}^2$      | $23.05 (\nu: 0.3)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\text{drag}}$                  | $147.25^{+0.52}_{-0.51}$        | $\chi_{\text{CamSpec}}^2$   | $11513.7 (\nu: 15.0)$        |
| $c_{TE}$                             | $0.9962^{+0.0096}_{-0.0098}$    | $k_{\text{D}}$                     | $0.14066^{+0.00062}_{-0.00062}$ | $\chi_{\text{H073p45}}^2$   | $6.5 (\nu: 2.7)$             |
| $c_{EE}$                             | $0.9918^{+0.0097}_{-0.0096}$    | $100\theta_{\text{D}}$             | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{\text{JLA}}^2$       | $1036.1 (\nu: 1.3)$          |
| $H_0$                                | $69.3^{+1.5}_{-1.5}$            | $z_{\text{eq}}$                    | $3392^{+48}_{-48}$              | $\chi_{6\text{DF}}^2$       | $0.14 (\nu: 0.0)$            |
| $\Omega_{\Lambda}$                   | $0.703^{+0.013}_{-0.013}$       | $k_{\text{eq}}$                    | $0.01035^{+0.00015}_{-0.00015}$ | $\chi_{\text{MGS}}^2$       | $2.73 (\nu: 0.3)$            |
| $\Omega_{\text{m}}$                  | $0.297^{+0.013}_{-0.013}$       | $100\theta_{\text{eq}}$            | $0.8150^{+0.0091}_{-0.0090}$    | $\chi_{\text{DR12BAO}}^2$   | $5.2 (\nu: 1.0)$             |
| $\Omega_{\text{m}}h^2$               | $0.1426^{+0.0020}_{-0.0020}$    | $100\theta_{\text{s,eq}}$          | $0.4503^{+0.0047}_{-0.0046}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.7)$             |
| $\Omega_{\text{m}}h^3$               | $0.0988^{+0.0025}_{-0.0026}$    | $H(0.15)$                          | $74.3^{+1.4}_{-1.3}$            | $\chi_{\text{CMB}}^2$       | $11942.6 (\nu: 16.3)$        |
| $\sigma_8$                           | $0.827^{+0.021}_{-0.022}$       | $D_{\text{M}}(0.15)$               | $627^{+12}_{-11}$               | $\chi_{\text{BAO}}^2$       | $8.1 (\nu: 2.2)$             |
| $S_8$                                | $0.823^{+0.022}_{-0.022}$       | $H(0.38)$                          | $83.7^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 13001.06; \Delta\bar{\chi}_{\text{eff}}^2 = -2.57; R - 1 = 0.01205$$



## 15.15 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02232^{+0.00031}_{-0.00029}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.016}_{-0.015}$       | $D_{\mathrm{M}}(0.38)$      | $1504^{+25}_{-25}$           |
| $\Omega_{\mathrm{c}}h^2$               | $0.1196^{+0.0025}_{-0.0025}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.611^{+0.019}_{-0.019}$       | $H(0.51)$                   | $90.01^{+0.96}_{-0.98}$      |
| $100\theta_{\mathrm{MC}}$              | $1.04090^{+0.00061}_{-0.00059}$ | $\sigma_8/h^{0.5}$                   | $0.994^{+0.028}_{-0.027}$       | $D_{\mathrm{M}}(0.51)$      | $1953^{+30}_{-30}$           |
| $\tau$                                 | $0.054^{+0.012}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $102.0^{+2.2}_{-2.2}$           | $H(0.61)$                   | $95.35^{+0.78}_{-0.79}$      |
| $w_0$                                  | $-1.00^{+0.16}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$          | $2.451^{+0.062}_{-0.063}$       | $D_{\mathrm{M}}(0.61)$      | $2277^{+33}_{-32}$           |
| $w_{\mathrm{a}}$                       | $-0.23^{+0.60}_{-0.63}$         | $z_{\mathrm{re}}$                    | $< 8.77$                        | $H(2.33)$                   | $234.8^{+1.9}_{-1.8}$        |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.041^{+0.027}_{-0.025}$       | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.057}_{-0.052}$       | $D_{\mathrm{M}}(2.33)$      | $5755^{+21}_{-20}$           |
| $n_{\mathrm{s}}$                       | $0.9660^{+0.0084}_{-0.0084}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$           | $0.459^{+0.016}_{-0.016}$    |
| $y_{\mathrm{cal}}$                     | $1.0004^{+0.0050}_{-0.0048}$    | $D_{40}$                             | $1226^{+25}_{-24}$              | $\sigma_8(0.15)$            | $0.766^{+0.024}_{-0.025}$    |
| $A_{100}^{\mathrm{PS}}$                | $239^{+50}_{-50}$               | $D_{220}$                            | $5719^{+76}_{-76}$              | $f\sigma_8(0.38)$           | $0.484^{+0.019}_{-0.019}$    |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{810}$                            | $2535^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.680^{+0.022}_{-0.022}$    |
| $A_{217}^{\mathrm{PS}}$                | $103^{+30}_{-30}$               | $D_{1420}$                           | $815.6^{+9.6}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.485^{+0.020}_{-0.020}$    |
| $A_{217}^{\mathrm{CIB}}$               | $39^{+10}_{-10}$                | $D_{2000}$                           | $230.4^{+3.2}_{-3.1}$           | $\sigma_8(0.51)$            | $0.637^{+0.020}_{-0.021}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.47$                        | $n_{\mathrm{s},0.002}$               | $0.9660^{+0.0084}_{-0.0084}$    | $f\sigma_8(0.61)$           | $0.481^{+0.020}_{-0.020}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00012}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.606^{+0.019}_{-0.020}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00012}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3059^{+0.0096}_{-0.010}$  |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.596^{+0.056}_{-0.055}$       | $\sigma_8(2.33)$            | $0.3131^{+0.0077}_{-0.0078}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.749^{+0.062}_{-0.058}$      | $f_{2000}^{143}$            | $30^{+6}_{-5}$               |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.39}_{-0.38}$          | $z_*$                                | $1089.95^{+0.51}_{-0.52}$       | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $r_*$                                | $144.57^{+0.57}_{-0.58}$        | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$                        | $1.04109^{+0.00060}_{-0.00059}$ | $\chi_{\mathrm{simall}}^2$  | $396.7 (\nu: 1.2)$           |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.32}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.886^{+0.054}_{-0.054}$      | $\chi_{\mathrm{lowl}}^2$    | $23.04 (\nu: 0.4)$           |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                  | $1059.79^{+0.64}_{-0.62}$       | $\chi_{\mathrm{CamSpec}}^2$ | $11513.9 (\nu: 15.5)$        |
| $c_{217}$                              | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                  | $147.25^{+0.58}_{-0.59}$        | $\chi_{\mathrm{H073p45}}^2$ | $6.6 (\nu: 2.7)$             |
| $c_{TE}$                               | $0.9961^{+0.0096}_{-0.0095}$    | $k_{\mathrm{D}}$                     | $0.14066^{+0.00067}_{-0.00067}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.1 (\nu: 1.3)$          |
| $c_{EE}$                               | $0.9916^{+0.0098}_{-0.0096}$    | $100\theta_{\mathrm{D}}$             | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{6\mathrm{DF}}^2$     | $0.14 (\nu: 0.0)$            |
| $H_0$                                  | $69.3^{+1.5}_{-1.5}$            | $z_{\mathrm{eq}}$                    | $3392^{+57}_{-56}$              | $\chi_{\mathrm{MGS}}^2$     | $2.70 (\nu: 0.3)$            |
| $\Omega_{\Lambda}$                     | $0.703^{+0.013}_{-0.014}$       | $k_{\mathrm{eq}}$                    | $0.01035^{+0.00017}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $5.1 (\nu: 0.9)$             |
| $\Omega_{\mathrm{m}}$                  | $0.297^{+0.014}_{-0.013}$       | $100\theta_{\mathrm{eq}}$            | $0.815^{+0.011}_{-0.011}$       | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.7)$             |
| $\Omega_{\mathrm{m}}h^2$               | $0.1426^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4503^{+0.0055}_{-0.0055}$    | $\chi_{\mathrm{BAO}}^2$     | $8.0 (\nu: 2.1)$             |
| $\Omega_{\mathrm{m}}h^3$               | $0.0988^{+0.0027}_{-0.0027}$    | $H(0.15)$                            | $74.3^{+1.4}_{-1.4}$            | $\chi_{\mathrm{CMB}}^2$     | $11933.7 (\nu: 15.7)$        |
| $\sigma_8$                             | $0.828^{+0.026}_{-0.027}$       | $D_{\mathrm{M}}(0.15)$               | $628^{+12}_{-12}$               |                             |                              |
| $S_8$                                  | $0.824^{+0.029}_{-0.028}$       | $H(0.38)$                            | $83.7^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 12992.15; R - 1 = 0.01047$$



## 15.16 base\_w\_wa\_CamSpecHM\_TTTEEE\_lowl\_lowE\_BAO\_Riess18\_Pantheon18\_post\_lensing\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02232^{+0.00030}_{-0.00028}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.012}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1503^{+25}_{-25}$           |
| $\Omega_{\mathrm{c}}h^2$               | $0.1196^{+0.0021}_{-0.0021}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.611^{+0.014}_{-0.014}$       | $H(0.51)$                   | $90.03^{+0.96}_{-0.98}$      |
| $100\theta_{\mathrm{MC}}$              | $1.04090^{+0.00060}_{-0.00058}$ | $\sigma_8/h^{0.5}$                   | $0.994^{+0.020}_{-0.021}$       | $D_{\mathrm{M}}(0.51)$      | $1952^{+30}_{-30}$           |
| $\tau$                                 | $0.054^{+0.012}_{-0.011}$       | $r_{\mathrm{drag}}h$                 | $102.0^{+2.2}_{-2.2}$           | $H(0.61)$                   | $95.37^{+0.78}_{-0.79}$      |
| $w_0$                                  | $-1.00^{+0.15}_{-0.15}$         | $\langle d^2 \rangle^{1/2}$          | $2.450^{+0.046}_{-0.047}$       | $D_{\mathrm{M}}(0.61)$      | $2276^{+32}_{-32}$           |
| $w_{\mathrm{a}}$                       | $-0.23^{+0.56}_{-0.59}$         | $z_{\mathrm{re}}$                    | $< 8.70$                        | $H(2.33)$                   | $234.7^{+1.9}_{-1.8}$        |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.041^{+0.025}_{-0.023}$       | $10^9 A_{\mathrm{s}}$                | $2.093^{+0.052}_{-0.047}$       | $D_{\mathrm{M}}(2.33)$      | $5754^{+21}_{-20}$           |
| $n_{\mathrm{s}}$                       | $0.9660^{+0.0080}_{-0.0078}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.020}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $y_{\mathrm{cal}}$                     | $1.0004^{+0.0050}_{-0.0048}$    | $D_{40}$                             | $1226^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.766^{+0.020}_{-0.020}$    |
| $A_{100}^{\mathrm{PS}}$                | $239^{+50}_{-50}$               | $D_{220}$                            | $5721^{+75}_{-75}$              | $f\sigma_8(0.38)$           | $0.483^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{PS}}$                | $39^{+20}_{-20}$                | $D_{810}$                            | $2535^{+26}_{-25}$              | $\sigma_8(0.38)$            | $0.680^{+0.018}_{-0.018}$    |
| $A_{217}^{\mathrm{PS}}$                | $102^{+30}_{-30}$               | $D_{1420}$                           | $815.6^{+9.6}_{-9.3}$           | $f\sigma_8(0.51)$           | $0.484^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{CIB}}$               | $40^{+10}_{-10}$                | $D_{2000}$                           | $230.3^{+3.2}_{-3.1}$           | $\sigma_8(0.51)$            | $0.636^{+0.017}_{-0.017}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.40$                        | $n_{\mathrm{s},0.002}$               | $0.9660^{+0.0080}_{-0.0078}$    | $f\sigma_8(0.61)$           | $0.481^{+0.016}_{-0.016}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.66^{+0.25}_{-0.25}$          | $Y_{\mathrm{P}}$                     | $0.24537^{+0.00011}_{-0.00012}$ | $\sigma_8(0.61)$            | $0.605^{+0.016}_{-0.016}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.24670^{+0.00011}_{-0.00012}$ | $f\sigma_8(2.33)$           | $0.3059^{+0.0081}_{-0.0085}$ |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $10^5\mathrm{D}/\mathrm{H}$          | $2.595^{+0.054}_{-0.054}$       | $\sigma_8(2.33)$            | $0.3130^{+0.0066}_{-0.0065}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $\mathrm{Age}/\mathrm{Gyr}$          | $13.748^{+0.060}_{-0.057}$      | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.38}_{-0.38}$          | $z_*$                                | $1089.94^{+0.47}_{-0.48}$       | $f_{2000}^{217}$            | $106.7^{+3.7}_{-3.9}$        |
| $A_{143}^{\mathrm{dust}}$              | $0.96^{+0.34}_{-0.34}$          | $r_*$                                | $144.58^{+0.50}_{-0.49}$        | $f_{2000}^{143\times 217}$  | $32^{+4}_{-4}$               |
| $A_{217}^{\mathrm{dust}}$              | $0.98^{+0.20}_{-0.20}$          | $100\theta_*$                        | $1.04109^{+0.00060}_{-0.00058}$ | $\chi_{\mathrm{lensing}}^2$ | $9.10\,(\nu: 0.2)$           |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.888^{+0.047}_{-0.047}$      | $\chi_{\mathrm{simall}}^2$  | $396.6\,(\nu: 1.0)$          |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                  | $1059.79^{+0.63}_{-0.62}$       | $\chi_{\mathrm{lowl}}^2$    | $23.04\,(\nu: 0.3)$          |
| $c_{217}$                              | $1.0011^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                  | $147.26^{+0.51}_{-0.51}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11513.6\,(\nu: 14.9)$       |
| $c_{TE}$                               | $0.9961^{+0.0096}_{-0.0097}$    | $k_{\mathrm{D}}$                     | $0.14065^{+0.00062}_{-0.00062}$ | $\chi_{\mathrm{H073p45}}^2$ | $6.5\,(\nu: 2.7)$            |
| $c_{EE}$                               | $0.9917^{+0.0097}_{-0.0096}$    | $100\theta_{\mathrm{D}}$             | $0.16084^{+0.00037}_{-0.00037}$ | $\chi_{\mathrm{JLA}}^2$     | $1036.1\,(\nu: 1.3)$         |
| $H_0$                                  | $69.3^{+1.5}_{-1.5}$            | $z_{\mathrm{eq}}$                    | $3390^{+47}_{-47}$              | $\chi_{6\mathrm{DF}}^2$     | $0.14\,(\nu: 0.0)$           |
| $\Omega_{\Lambda}$                     | $0.703^{+0.013}_{-0.013}$       | $k_{\mathrm{eq}}$                    | $0.01035^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{MGS}}^2$     | $2.73\,(\nu: 0.3)$           |
| $\Omega_{\mathrm{m}}$                  | $0.297^{+0.013}_{-0.013}$       | $100\theta_{\mathrm{eq}}$            | $0.8153^{+0.0089}_{-0.0088}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $5.2\,(\nu: 1.0)$            |
| $\Omega_{\mathrm{m}}h^2$               | $0.1425^{+0.0020}_{-0.0020}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4505^{+0.0046}_{-0.0045}$    | $\chi_{\mathrm{prior}}^2$   | $7.8\,(\nu: 5.8)$            |
| $\Omega_{\mathrm{m}}h^3$               | $0.0987^{+0.0025}_{-0.0025}$    | $H(0.15)$                            | $74.3^{+1.4}_{-1.3}$            | $\chi_{\mathrm{CMB}}^2$     | $11942.3\,(\nu: 15.9)$       |
| $\sigma_8$                             | $0.827^{+0.021}_{-0.022}$       | $D_{\mathrm{M}}(0.15)$               | $627^{+12}_{-11}$               | $\chi_{\mathrm{BAO}}^2$     | $8.0\,(\nu: 2.2)$            |
| $S_8$                                  | $0.823^{+0.022}_{-0.022}$       | $H(0.38)$                            | $83.7^{+1.2}_{-1.2}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 13000.80; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -2.74; R - 1 = 0.01150$$



## 16 yhe

### 16.1 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.02213  | $0.02211^{+0.00058}_{-0.00058}$ | $S_8$                       | 0.837    | $0.838^{+0.051}_{-0.049}$       | $100\theta_{s,eq}$          | 0.4488   | $0.4486^{+0.0097}_{-0.0097}$ |
| $\Omega_c h^2$              | 0.12043  | $0.1205^{+0.0045}_{-0.0043}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4583   | $0.459^{+0.028}_{-0.027}$       | $H(0.15)$                   | 72.37    | $72.3^{+2.0}_{-1.9}$         |
| $100\theta_{MC}$            | 1.04094  | $1.0407^{+0.0017}_{-0.0018}$    | $\sigma_8 \Omega_m^{0.25}$  | 0.6099   | $0.610^{+0.024}_{-0.024}$       | $D_M(0.15)$                 | 646.4    | $648^{+20}_{-19}$            |
| $\tau$                      | 0.0525   | $0.052^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | 0.9914   | $0.991^{+0.033}_{-0.032}$       | $H(0.38)$                   | 82.61    | $82.5^{+1.5}_{-1.4}$         |
| $Y_P$                       | 0.2478   | $0.242^{+0.040}_{-0.042}$       | $r_{drag} h$                | 98.67    | $98.5^{+3.7}_{-3.6}$            | $D_M(0.38)$                 | 1539.8   | $1542^{+40}_{-39}$           |
| $\ln(10^{10} A_s)$          | 3.0397   | $3.038^{+0.036}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | 2.447    | $2.451^{+0.088}_{-0.085}$       | $H(0.51)$                   | 89.39    | $89.3^{+1.2}_{-1.2}$         |
| $n_s$                       | 0.9644   | $0.963^{+0.021}_{-0.021}$       | $z_{re}$                    | 7.57     | $7.5^{+1.6}_{-1.7}$             | $D_M(0.51)$                 | 1993.5   | $1996^{+47}_{-46}$           |
| $y_{cal}$                   | 1.00033  | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | 2.090    | $2.088^{+0.075}_{-0.072}$       | $H(0.61)$                   | 95.07    | $95.0^{+1.0}_{-1.0}$         |
| $A_{100}^{PS}$              | 247      | $242^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | 1.8815   | $1.880^{+0.030}_{-0.029}$       | $D_M(0.61)$                 | 2319     | $2322^{+50}_{-50}$           |
| $A_{143}^{PS}$              | 38.4     | $40^{+20}_{-20}$                | $D_{40}$                    | 1228.0   | $1232^{+44}_{-43}$              | $H(2.33)$                   | 236.61   | $236.6^{+2.6}_{-2.5}$        |
| $A_{217}^{PS}$              | 99.1     | $101^{+30}_{-30}$               | $D_{220}$                   | 5701     | $5703^{+82}_{-81}$              | $D_M(2.33)$                 | 5775     | $5778^{+50}_{-50}$           |
| $A_{217}^{CIB}$             | 43.2     | $41^{+20}_{-10}$                | $D_{810}$                   | 2532.9   | $2534^{+27}_{-27}$              | $f\sigma_8(0.15)$           | 0.4623   | $0.463^{+0.025}_{-0.025}$    |
| $A_{143}^{tSZ}$             | 3.96     | $< 7.38$                        | $D_{1420}$                  | 813.2    | $814^{+10}_{-11}$               | $\sigma_8(0.15)$            | 0.7492   | $0.748^{+0.017}_{-0.017}$    |
| $r_{143 \times 217}^{PS}$   | 0.554    | $0.65^{+0.26}_{-0.25}$          | $D_{2000}$                  | 229.03   | $229.8^{+5.0}_{-4.9}$           | $f\sigma_8(0.38)$           | 0.4790   | $0.479^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{CIB}$  | 0.63     | —                               | $n_{s,0.002}$               | 0.9644   | $0.963^{+0.021}_{-0.021}$       | $\sigma_8(0.38)$            | 0.6633   | $0.662^{+0.015}_{-0.014}$    |
| $\xi^{tSZ \times CIB}$      | 0.00     | —                               | $Y_P$                       | 0.2478   | $0.242^{+0.040}_{-0.042}$       | $f\sigma_8(0.51)$           | 0.4767   | $0.477^{+0.017}_{-0.017}$    |
| $A^{kSZ}$                   | 4.3      | —                               | $Y_P^{BBN}$                 | 0.2491   | $0.244^{+0.040}_{-0.042}$       | $\sigma_8(0.51)$            | 0.6204   | $0.619^{+0.014}_{-0.013}$    |
| $A_{100}^{dust}$            | 1.008    | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                     | 13.823   | $13.83^{+0.12}_{-0.11}$         | $f\sigma_8(0.61)$           | 0.4711   | $0.471^{+0.015}_{-0.015}$    |
| $A_{143}^{dust}$            | 0.979    | $0.97^{+0.34}_{-0.35}$          | $z_*$                       | 1090.36  | $1090.2^{+1.4}_{-1.3}$          | $\sigma_8(0.61)$            | 0.5901   | $0.589^{+0.013}_{-0.013}$    |
| $A_{217}^{dust}$            | 0.962    | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | 144.49   | $144.50^{+0.97}_{-0.98}$        | $f\sigma_8(2.33)$           | 0.2973   | $0.2967^{+0.0070}_{-0.0067}$ |
| $A_{143 \times 217}^{dust}$ | 1.011    | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$               | 1.04108  | $1.04103^{+0.00099}_{-0.00098}$ | $\sigma_8(2.33)$            | 0.3061   | $0.3056^{+0.0076}_{-0.0074}$ |
| $c_{100}$                   | 0.99736  | $0.9975^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | 13.879   | $13.881^{+0.089}_{-0.091}$      | $f_{2000}^{143}$            | 31.7     | $30^{+8}_{-8}$               |
| $c_{217}$                   | 1.00131  | $1.0012^{+0.0031}_{-0.0031}$    | $z_{drag}$                  | 1059.51  | $1059.3^{+2.3}_{-2.4}$          | $f_{2000}^{217}$            | 108.1    | $107.3^{+5.5}_{-5.5}$        |
| $H_0$                       | 67.01    | $66.9^{+2.2}_{-2.2}$            | $r_{drag}$                  | 147.23   | $147.25^{+0.97}_{-1.0}$         | $f_{2000}^{143 \times 217}$ | 33.5     | $33^{+6}_{-6}$               |
| $\Omega_\Lambda$            | 0.6811   | $0.679^{+0.029}_{-0.031}$       | $k_D$                       | 0.14043  | $0.1406^{+0.0016}_{-0.0015}$    | $\chi_{simall}^2$           | 395.89   | $397.0 (\nu: 1.4)$           |
| $\Omega_m$                  | 0.3189   | $0.321^{+0.031}_{-0.029}$       | $100\theta_D$               | 0.16118  | $0.1610^{+0.0016}_{-0.0016}$    | $\chi_{lowl}^2$             | 23.34    | $23.9 (\nu: 2.2)$            |
| $\Omega_m h^2$              | 0.14321  | $0.1433^{+0.0042}_{-0.0040}$    | $z_{eq}$                    | 3407     | $3409^{+100}_{-97}$             | $\chi_{CamSpec}^2$          | 7050.2   | $7063.9 (\nu: 15.9)$         |
| $\Omega_m h^3$              | 0.09597  | $0.0958^{+0.0015}_{-0.0015}$    | $k_{eq}$                    | 0.010398 | $0.01040^{+0.00031}_{-0.00030}$ | $\chi_{prior}^2$            | 2.4      | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                  | 0.8116   | $0.811^{+0.019}_{-0.019}$       | $100\theta_{eq}$            | 0.8118   | $0.811^{+0.019}_{-0.019}$       | $\chi_{CMB}^2$              | 7469.4   | $7484.8 (\nu: 16.2)$         |

Best-fit  $\chi_{eff}^2 = 7471.80$ ;  $\Delta\chi_{eff}^2 = 0.06$ ;  $\bar{\chi}_{eff}^2 = 7492.39$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.85$ ;  $R - 1 = 0.00648$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.89 ( $\Delta$  0.05) commander\_dx12\_v3.2.29: 23.34 ( $\Delta$  -0.06) CamSpec like\_10.7HM: 7050.19 ( $\Delta$  -0.15)



## 16.2 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02226^{+0.00047}_{-0.00048}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.38)$      | $1527^{+22}_{-21}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1189^{+0.0024}_{-0.0024}$    | $\sigma_8 / h^{0.5}$                  | $0.982^{+0.024}_{-0.024}$       | $H(0.51)$                   | $89.75^{+0.77}_{-0.75}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0412^{+0.0015}_{-0.0015}$    | $r_{\mathrm{drag}} h$                 | $99.9^{+1.9}_{-1.9}$            | $D_{\mathrm{M}}(0.51)$      | $1979^{+26}_{-26}$           |
| $\tau$                                   | $0.054^{+0.016}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$           | $2.422^{+0.057}_{-0.057}$       | $H(0.61)$                   | $95.35^{+0.70}_{-0.70}$      |
| $Y_{\mathrm{P}}$                         | $0.250^{+0.036}_{-0.038}$       | $z_{\mathrm{re}}$                     | $7.7^{+1.6}_{-1.6}$             | $D_{\mathrm{M}}(0.61)$      | $2303^{+28}_{-28}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.035}_{-0.035}$       | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.075}_{-0.071}$       | $H(2.33)$                   | $235.8^{+1.6}_{-1.6}$        |
| $n_{\mathrm{s}}$                         | $0.969^{+0.016}_{-0.016}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+37}_{-36}$           |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0048}_{-0.0049}$    | $D_{40}$                              | $1219^{+34}_{-34}$              | $f\sigma_8(0.15)$           | $0.454^{+0.016}_{-0.015}$    |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{220}$                             | $5709^{+80}_{-80}$              | $\sigma_8(0.15)$            | $0.747^{+0.017}_{-0.017}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                             | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-11}$               | $\sigma_8(0.38)$            | $0.662^{+0.015}_{-0.015}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{2000}$                            | $229.5^{+4.8}_{-4.8}$           | $f\sigma_8(0.51)$           | $0.472^{+0.012}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.43$                        | $n_{\mathrm{s},0.002}$                | $0.969^{+0.016}_{-0.016}$       | $\sigma_8(0.51)$            | $0.620^{+0.014}_{-0.014}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.250^{+0.036}_{-0.038}$       | $f\sigma_8(0.61)$           | $0.467^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.251^{+0.036}_{-0.038}$       | $\sigma_8(0.61)$            | $0.590^{+0.013}_{-0.013}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | Age/Gyr                               | $13.796^{+0.085}_{-0.084}$      | $f\sigma_8(2.33)$           | $0.2976^{+0.0067}_{-0.0066}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.2^{+1.3}_{-1.3}$          | $\sigma_8(2.33)$            | $0.3069^{+0.0069}_{-0.0068}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $r_*$                                 | $144.78^{+0.73}_{-0.72}$        | $f_{2000}^{143}$            | $31^{+8}_{-8}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$                         | $1.04127^{+0.00084}_{-0.00086}$ | $f_{2000}^{217}$            | $107.8^{+5.3}_{-5.3}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.904^{+0.073}_{-0.071}$      | $f_{2000}^{143 \times 217}$ | $33^{+6}_{-6}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $z_{\mathrm{drag}}$                   | $1059.8^{+2.1}_{-2.1}$          | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.6)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0022}$    | $r_{\mathrm{drag}}$                   | $147.49^{+0.82}_{-0.81}$        | $\chi_{\mathrm{lowl}}^2$    | $22.7 (\nu: 0.8)$            |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.1402^{+0.0012}_{-0.0012}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7064.8 (\nu: 15.4)$         |
| $H_0$                                    | $67.7^{+1.2}_{-1.2}$            | $100\theta_{\mathrm{D}}$              | $0.1612^{+0.0015}_{-0.0015}$    | $\chi_{6\mathrm{DF}}^2$     | $0.054 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.691^{+0.015}_{-0.015}$       | $z_{\mathrm{eq}}$                     | $3374^{+57}_{-57}$              | $\chi_{\mathrm{MGS}}^2$     | $1.43 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.015}_{-0.015}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1418^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{eq}}$             | $0.818^{+0.010}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.1)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0961^{+0.0014}_{-0.0014}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4521^{+0.0054}_{-0.0054}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |
| $\sigma_8$                               | $0.808^{+0.019}_{-0.018}$       | $H(0.15)$                             | $73.0^{+1.1}_{-1.1}$            | $\chi_{\mathrm{CMB}}^2$     | $7484.5 (\nu: 15.3)$         |
| $S_8$                                    | $0.820^{+0.030}_{-0.030}$       | $D_{\mathrm{M}}(0.15)$                | $640^{+11}_{-10}$               |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.449^{+0.016}_{-0.016}$       | $H(0.38)$                             | $83.06^{+0.87}_{-0.86}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7498.32; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.77; R - 1 = 0.01513$$



### 16.3 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02211^{+0.00055}_{-0.00053}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.457^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$      | $647^{+15}_{-15}$            |
| $\Omega_{\mathrm{c}} h^2$                | $0.1203^{+0.0032}_{-0.0032}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $H(0.38)$                   | $82.6^{+1.2}_{-1.2}$         |
| $100\theta_{\mathrm{MC}}$                | $1.0407^{+0.0017}_{-0.0016}$    | $\sigma_8/h^{0.5}$                    | $0.990^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$      | $1541^{+31}_{-32}$           |
| $\tau$                                   | $0.053^{+0.017}_{-0.016}$       | $r_{\mathrm{drag}} h$                 | $98.7^{+2.8}_{-2.7}$            | $H(0.51)$                   | $89.3^{+1.0}_{-0.97}$        |
| $Y_{\mathrm{P}}$                         | $0.241^{+0.040}_{-0.042}$       | $\langle d^2 \rangle^{1/2}$           | $2.449^{+0.056}_{-0.057}$       | $D_{\mathrm{M}}(0.51)$      | $1995^{+36}_{-37}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.038^{+0.034}_{-0.033}$       | $z_{\mathrm{re}}$                     | $7.5^{+1.6}_{-1.7}$             | $H(0.61)$                   | $95.02^{+0.91}_{-0.85}$      |
| $n_{\mathrm{s}}$                         | $0.962^{+0.020}_{-0.019}$       | $10^9 A_{\mathrm{s}}$                 | $2.087^{+0.072}_{-0.068}$       | $D_{\mathrm{M}}(0.61)$      | $2320^{+40}_{-41}$           |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.028}_{-0.027}$       | $H(2.33)$                   | $236.5^{+1.9}_{-1.9}$        |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{40}$                              | $1232^{+38}_{-37}$              | $D_{\mathrm{M}}(2.33)$      | $5778^{+44}_{-46}$           |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5707^{+82}_{-81}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{810}$                             | $2533^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.015}_{-0.014}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+20}_{-10}$                | $D_{1420}$                            | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.47$                        | $D_{2000}$                            | $230.0^{+4.9}_{-4.9}$           | $\sigma_8(0.38)$            | $0.662^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.962^{+0.020}_{-0.019}$       | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.241^{+0.040}_{-0.042}$       | $\sigma_8(0.51)$            | $0.619^{+0.013}_{-0.013}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.242^{+0.040}_{-0.042}$       | $f\sigma_8(0.61)$           | $0.4701^{+0.0097}_{-0.0098}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.83^{+0.10}_{-0.11}$         | $\sigma_8(0.61)$            | $0.589^{+0.013}_{-0.012}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $z_*$                                 | $1090.1^{+1.3}_{-1.3}$          | $f\sigma_8(2.33)$           | $0.2966^{+0.0069}_{-0.0067}$ |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.35}$          | $r_*$                                 | $144.57^{+0.76}_{-0.77}$        | $\sigma_8(2.33)$            | $0.3055^{+0.0077}_{-0.0075}$ |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04103^{+0.00092}_{-0.00093}$ | $f_{2000}^{143}$            | $30^{+8}_{-8}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.887^{+0.072}_{-0.074}$      | $f_{2000}^{217}$            | $107.1^{+5.5}_{-5.5}$        |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.2^{+2.3}_{-2.3}$          | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$               |
| $c_{217}$                                | $1.0011^{+0.0030}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.31^{+0.81}_{-0.83}$        | $\chi_{\mathrm{lensing}}^2$ | $9.50 (\nu: 0.4)$            |
| $H_0$                                    | $67.0^{+1.8}_{-1.7}$            | $k_{\mathrm{D}}$                      | $0.1406^{+0.0014}_{-0.0013}$    | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.4)$           |
| $\Omega_{\Lambda}$                       | $0.681^{+0.022}_{-0.023}$       | $100\theta_{\mathrm{D}}$              | $0.1609^{+0.0016}_{-0.0015}$    | $\chi_{\mathrm{lowl}}^2$    | $23.9 (\nu: 1.6)$            |
| $\Omega_{\mathrm{m}}$                    | $0.319^{+0.023}_{-0.022}$       | $z_{\mathrm{eq}}$                     | $3403^{+71}_{-71}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7063.4 (\nu: 14.4)$         |
| $\Omega_{\mathrm{m}} h^2$                | $0.1431^{+0.0030}_{-0.0030}$    | $k_{\mathrm{eq}}$                     | $0.01039^{+0.00022}_{-0.00022}$ | $\chi_{\mathrm{prior}}^2$   | $7.5 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0958^{+0.0015}_{-0.0015}$    | $100\theta_{\mathrm{eq}}$             | $0.812^{+0.014}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.8 (\nu: 15.9)$         |
| $\sigma_8$                               | $0.810^{+0.015}_{-0.015}$       | $100\theta_{\mathrm{s,eq}}$           | $0.4491^{+0.0071}_{-0.0068}$    |                             |                              |
| $S_8$                                    | $0.835^{+0.032}_{-0.032}$       | $H(0.15)$                             | $72.3^{+1.6}_{-1.5}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7501.32; \Delta \bar{\chi}_{\mathrm{eff}}^2 = 1.07; R - 1 = 0.00730$$



## 16.4 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02225^{+0.00047}_{-0.00048}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$      | $1529^{+21}_{-21}$           |
| $\Omega_{\mathrm{c}}h^2$               | $0.1191^{+0.0022}_{-0.0021}$    | $\sigma_8/h^{0.5}$                   | $0.985^{+0.019}_{-0.019}$       | $H(0.51)$                   | $89.70^{+0.74}_{-0.73}$      |
| $100\theta_{\mathrm{MC}}$              | $1.0411^{+0.0015}_{-0.0015}$    | $r_{\mathrm{drag}}h$                 | $99.7^{+1.7}_{-1.8}$            | $D_{\mathrm{M}}(0.51)$      | $1981^{+25}_{-25}$           |
| $\tau$                                 | $0.056^{+0.015}_{-0.014}$       | $\langle d^2 \rangle^{1/2}$          | $2.432^{+0.047}_{-0.045}$       | $H(0.61)$                   | $95.31^{+0.70}_{-0.67}$      |
| $Y_{\mathrm{P}}$                       | $0.248^{+0.036}_{-0.037}$       | $z_{\mathrm{re}}$                    | $7.8^{+1.5}_{-1.5}$             | $D_{\mathrm{M}}(0.61)$      | $2305^{+27}_{-27}$           |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.045^{+0.032}_{-0.031}$       | $10^9 A_{\mathrm{s}}$                | $2.101^{+0.069}_{-0.063}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.4}$        |
| $n_{\mathrm{s}}$                       | $0.968^{+0.016}_{-0.016}$       | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.878^{+0.027}_{-0.026}$       | $D_{\mathrm{M}}(2.33)$      | $5764^{+36}_{-37}$           |
| $y_{\mathrm{cal}}$                     | $1.0007^{+0.0048}_{-0.0047}$    | $D_{40}$                             | $1223^{+33}_{-33}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{100}^{\mathrm{PS}}$                | $243^{+50}_{-50}$               | $D_{220}$                            | $5715^{+79}_{-81}$              | $\sigma_8(0.15)$            | $0.749^{+0.014}_{-0.014}$    |
| $A_{143}^{\mathrm{PS}}$                | $41^{+20}_{-20}$                | $D_{810}$                            | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.010}$    |
| $A_{217}^{\mathrm{PS}}$                | $101^{+30}_{-30}$               | $D_{1420}$                           | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.664^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$               | $41^{+20}_{-10}$                | $D_{2000}$                           | $229.8^{+4.7}_{-4.8}$           | $f\sigma_8(0.51)$           | $0.4732^{+0.0099}_{-0.0096}$ |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.47$                        | $n_{\mathrm{s},0.002}$               | $0.968^{+0.016}_{-0.016}$       | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.012}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}$                     | $0.248^{+0.036}_{-0.037}$       | $f\sigma_8(0.61)$           | $0.4683^{+0.0093}_{-0.0092}$ |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.249^{+0.037}_{-0.038}$       | $\sigma_8(0.61)$            | $0.591^{+0.012}_{-0.012}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | Age/Gyr                              | $13.800^{+0.085}_{-0.085}$      | $f\sigma_8(2.33)$           | $0.2980^{+0.0061}_{-0.0061}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | $z_*$                                | $1090.1^{+1.3}_{-1.3}$          | $\sigma_8(2.33)$            | $0.3073^{+0.0066}_{-0.0066}$ |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $r_*$                                | $144.74^{+0.69}_{-0.65}$        | $f_{2000}^{143}$            | $31^{+8}_{-8}$               |
| $A_{143}^{\mathrm{dust}}$              | $0.97^{+0.33}_{-0.34}$          | $100\theta_*$                        | $1.04124^{+0.00084}_{-0.00086}$ | $f_{2000}^{217}$            | $107.6^{+5.4}_{-5.3}$        |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.21}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.901^{+0.067}_{-0.066}$      | $f_{2000}^{143\times 217}$  | $33^{+6}_{-6}$               |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                  | $1059.7^{+2.1}_{-2.0}$          | $\chi_{\mathrm{lensing}}^2$ | $9.42 (\nu: 0.3)$            |
| $c_{100}$                              | $0.9975^{+0.0020}_{-0.0022}$    | $r_{\mathrm{drag}}$                  | $147.45^{+0.77}_{-0.75}$        | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 1.9)$           |
| $c_{217}$                              | $1.0012^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                     | $0.1403^{+0.0012}_{-0.0012}$    | $\chi_{\mathrm{lowl}}^2$    | $23.0 (\nu: 0.9)$            |
| $H_0$                                  | $67.6^{+1.2}_{-1.1}$            | $100\theta_{\mathrm{D}}$             | $0.1611^{+0.0015}_{-0.0015}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7064.1 (\nu: 14.6)$         |
| $\Omega_{\Lambda}$                     | $0.689^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                    | $3378^{+51}_{-50}$              | $\chi_{6\mathrm{DF}}^2$     | $0.057 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                  | $0.311^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                    | $0.01031^{+0.00016}_{-0.00015}$ | $\chi_{\mathrm{MGS}}^2$     | $1.33 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}h^2$               | $0.1420^{+0.0021}_{-0.0021}$    | $100\theta_{\mathrm{eq}}$            | $0.8175^{+0.0091}_{-0.0092}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.8 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}}h^3$               | $0.0960^{+0.0014}_{-0.0014}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4516^{+0.0048}_{-0.0048}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.1)$             |
| $\sigma_8$                             | $0.810^{+0.016}_{-0.015}$       | $H(0.15)$                            | $72.9^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $7493.7 (\nu: 15.4)$         |
| $S_8$                                  | $0.824^{+0.024}_{-0.023}$       | $D_{\mathrm{M}}(0.15)$               | $641^{+10}_{-9.9}$              | $\chi_{\mathrm{BAO}}^2$     | $6.2 (\nu: 0.8)$             |
| $\sigma_8\Omega_{\mathrm{m}}^{0.5}$    | $0.451^{+0.013}_{-0.013}$       | $H(0.38)$                            | $83.00^{+0.85}_{-0.83}$         |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7507.45$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.97$ ;  $R - 1 = 0.01905$



# 16.5 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                            | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|--------------------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02213^{+0.00058}_{-0.00057}$ | $S_8$                                 | $0.838^{+0.051}_{-0.049}$       | $100\theta_{\mathrm{s},\mathrm{eq}}$ | $0.4488^{+0.0096}_{-0.0096}$ |
| $\Omega_{\mathrm{c}} h^2$                | $0.1204^{+0.0044}_{-0.0043}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.459^{+0.028}_{-0.027}$       | $H(0.15)$                            | $72.3^{+1.9}_{-1.9}$         |
| $100\theta_{\mathrm{MC}}$                | $1.0408^{+0.0017}_{-0.0017}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.610^{+0.024}_{-0.024}$       | $D_{\mathrm{M}}(0.15)$               | $647^{+20}_{-19}$            |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $\sigma_8/h^{0.5}$                    | $0.992^{+0.032}_{-0.032}$       | $H(0.38)$                            | $82.6^{+1.5}_{-1.4}$         |
| $Y_{\mathrm{P}}$                         | $0.243^{+0.040}_{-0.042}$       | $r_{\mathrm{drag}} h$                 | $98.6^{+3.7}_{-3.6}$            | $D_{\mathrm{M}}(0.38)$               | $1541^{+39}_{-39}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.030}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$           | $2.453^{+0.088}_{-0.084}$       | $H(0.51)$                            | $89.4^{+1.2}_{-1.2}$         |
| $n_{\mathrm{s}}$                         | $0.963^{+0.021}_{-0.021}$       | $z_{\mathrm{re}}$                     | $< 8.90$                        | $D_{\mathrm{M}}(0.51)$               | $1995^{+46}_{-45}$           |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}}$                 | $2.095^{+0.064}_{-0.060}$       | $H(0.61)$                            | $95.0^{+1.0}_{-0.98}$        |
| $A_{100}^{\mathrm{PS}}$                  | $242^{+50}_{-50}$               | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.880^{+0.030}_{-0.029}$       | $D_{\mathrm{M}}(0.61)$               | $2320^{+50}_{-49}$           |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{40}$                              | $1231^{+44}_{-43}$              | $H(2.33)$                            | $236.6^{+2.6}_{-2.5}$        |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{220}$                             | $5704^{+82}_{-81}$              | $D_{\mathrm{M}}(2.33)$               | $5777^{+50}_{-50}$           |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{810}$                             | $2534^{+27}_{-27}$              | $f\sigma_8(0.15)$                    | $0.463^{+0.025}_{-0.025}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.40$                        | $D_{1420}$                            | $814^{+10}_{-11}$               | $\sigma_8(0.15)$                     | $0.749^{+0.016}_{-0.015}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $D_{2000}$                            | $229.8^{+4.9}_{-4.9}$           | $f\sigma_8(0.38)$                    | $0.479^{+0.019}_{-0.019}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $n_{\mathrm{s},0.002}$                | $0.963^{+0.021}_{-0.021}$       | $\sigma_8(0.38)$                     | $0.663^{+0.014}_{-0.013}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}$                      | $0.243^{+0.040}_{-0.042}$       | $f\sigma_8(0.51)$                    | $0.477^{+0.016}_{-0.017}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.244^{+0.040}_{-0.042}$       | $\sigma_8(0.51)$                     | $0.621^{+0.013}_{-0.012}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                               | $13.83^{+0.11}_{-0.11}$         | $f\sigma_8(0.61)$                    | $0.471^{+0.015}_{-0.015}$    |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.34}_{-0.34}$          | $z_*$                                 | $1090.2^{+1.4}_{-1.3}$          | $\sigma_8(0.61)$                     | $0.590^{+0.013}_{-0.011}$    |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $r_*$                                 | $144.52^{+0.96}_{-0.98}$        | $f\sigma_8(2.33)$                    | $0.2973^{+0.0063}_{-0.0060}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.32}$          | $100\theta_*$                         | $1.04104^{+0.00099}_{-0.00098}$ | $\sigma_8(2.33)$                     | $0.3062^{+0.0068}_{-0.0066}$ |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.882^{+0.089}_{-0.091}$      | $f_{2000}^{143}$                     | $30^{+8}_{-8}$               |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $z_{\mathrm{drag}}$                   | $1059.3^{+2.3}_{-2.3}$          | $f_{2000}^{217}$                     | $107.4^{+5.5}_{-5.5}$        |
| $H_0$                                    | $67.0^{+2.2}_{-2.2}$            | $r_{\mathrm{drag}}$                   | $147.26^{+0.98}_{-1.0}$         | $f_{2000}^{143 \times 217}$          | $33^{+6}_{-6}$               |
| $\Omega_{\Lambda}$                       | $0.680^{+0.028}_{-0.031}$       | $k_{\mathrm{D}}$                      | $0.1406^{+0.0015}_{-0.0015}$    | $\chi_{\mathrm{simall}}^2$           | $396.9 (\nu: 1.5)$           |
| $\Omega_{\mathrm{m}}$                    | $0.320^{+0.031}_{-0.028}$       | $100\theta_{\mathrm{D}}$              | $0.1610^{+0.0016}_{-0.0015}$    | $\chi_{\mathrm{lowl}}^2$             | $23.8 (\nu: 2.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1432^{+0.0042}_{-0.0040}$    | $z_{\mathrm{eq}}$                     | $3407^{+99}_{-96}$              | $\chi_{\mathrm{CamSpec}}^2$          | $7063.8 (\nu: 15.9)$         |
| $\Omega_{\mathrm{m}} h^3$                | $0.0959^{+0.0015}_{-0.0015}$    | $k_{\mathrm{eq}}$                     | $0.01040^{+0.00030}_{-0.00029}$ | $\chi_{\mathrm{prior}}^2$            | $7.6 (\nu: 5.9)$             |
| $\sigma_8$                               | $0.812^{+0.019}_{-0.018}$       | $100\theta_{\mathrm{eq}}$             | $0.812^{+0.019}_{-0.019}$       | $\chi_{\mathrm{CMB}}^2$              | $7484.5 (\nu: 15.8)$         |

$\bar{\chi}_{\mathrm{eff}}^2 = 7492.12$ ;  $\Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.86$ ;  $R - 1 = 0.00634$



## 16.6 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02227^{+0.00047}_{-0.00048}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.38)$      | $1527^{+22}_{-21}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1189^{+0.0024}_{-0.0024}$    | $\sigma_8/h^{0.5}$                    | $0.983^{+0.024}_{-0.023}$       | $H(0.51)$                   | $89.76^{+0.77}_{-0.75}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0412^{+0.0015}_{-0.0015}$    | $r_{\mathrm{drag}} h$                 | $99.9^{+1.9}_{-1.9}$            | $D_{\mathrm{M}}(0.51)$      | $1979^{+26}_{-26}$           |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $\langle d^2 \rangle^{1/2}$           | $2.425^{+0.056}_{-0.053}$       | $H(0.61)$                   | $95.36^{+0.69}_{-0.70}$      |
| $Y_{\mathrm{P}}$                         | $0.250^{+0.036}_{-0.037}$       | $z_{\mathrm{re}}$                     | $< 9.02$                        | $D_{\mathrm{M}}(0.61)$      | $2303^{+28}_{-28}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.043^{+0.032}_{-0.030}$       | $10^9 A_{\mathrm{s}}$                 | $2.097^{+0.066}_{-0.062}$       | $H(2.33)$                   | $235.8^{+1.6}_{-1.6}$        |
| $n_{\mathrm{s}}$                         | $0.969^{+0.016}_{-0.016}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.877^{+0.029}_{-0.028}$       | $D_{\mathrm{M}}(2.33)$      | $5762^{+37}_{-36}$           |
| $y_{\mathrm{cal}}$                       | $1.0005^{+0.0049}_{-0.0049}$    | $D_{40}$                              | $1219^{+34}_{-33}$              | $f\sigma_8(0.15)$           | $0.454^{+0.015}_{-0.015}$    |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{220}$                             | $5710^{+81}_{-81}$              | $\sigma_8(0.15)$            | $0.748^{+0.016}_{-0.015}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                             | $2534^{+27}_{-27}$              | $f\sigma_8(0.38)$           | $0.473^{+0.013}_{-0.013}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-11}$               | $\sigma_8(0.38)$            | $0.663^{+0.014}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{2000}$                            | $229.5^{+4.8}_{-4.8}$           | $f\sigma_8(0.51)$           | $0.472^{+0.012}_{-0.012}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.43$                        | $n_{\mathrm{s},0.002}$                | $0.969^{+0.016}_{-0.016}$       | $\sigma_8(0.51)$            | $0.621^{+0.013}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.250^{+0.036}_{-0.037}$       | $f\sigma_8(0.61)$           | $0.467^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.251^{+0.036}_{-0.038}$       | $\sigma_8(0.61)$            | $0.591^{+0.013}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | Age/Gyr                               | $13.795^{+0.086}_{-0.084}$      | $f\sigma_8(2.33)$           | $0.2979^{+0.0064}_{-0.0060}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.2^{+1.3}_{-1.3}$          | $\sigma_8(2.33)$            | $0.3073^{+0.0066}_{-0.0063}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $r_*$                                 | $144.78^{+0.73}_{-0.72}$        | $f_{2000}^{143}$            | $31^{+8}_{-8}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.98^{+0.34}_{-0.34}$          | $100\theta_*$                         | $1.04127^{+0.00084}_{-0.00086}$ | $f_{2000}^{217}$            | $107.8^{+5.3}_{-5.3}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.904^{+0.073}_{-0.071}$      | $f_{2000}^{143 \times 217}$ | $33^{+6}_{-6}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.33}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.8^{+2.1}_{-2.1}$          | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.7)$           |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0022}$    | $r_{\mathrm{drag}}$                   | $147.49^{+0.82}_{-0.81}$        | $\chi_{\mathrm{lowl}}^2$    | $22.7 (\nu: 0.8)$            |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.1402^{+0.0012}_{-0.0012}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7064.7 (\nu: 15.5)$         |
| $H_0$                                    | $67.8^{+1.2}_{-1.2}$            | $100\theta_{\mathrm{D}}$              | $0.1612^{+0.0015}_{-0.0014}$    | $\chi_{6\mathrm{DF}}^2$     | $0.053 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.691^{+0.015}_{-0.015}$       | $z_{\mathrm{eq}}$                     | $3373^{+58}_{-57}$              | $\chi_{\mathrm{MGS}}^2$     | $1.45 (\nu: 0.2)$            |
| $\Omega_{\mathrm{m}}$                    | $0.309^{+0.015}_{-0.015}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1418^{+0.0024}_{-0.0024}$    | $100\theta_{\mathrm{eq}}$             | $0.818^{+0.010}_{-0.010}$       | $\chi_{\mathrm{prior}}^2$   | $7.7 (\nu: 6.2)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0961^{+0.0014}_{-0.0014}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4522^{+0.0054}_{-0.0054}$    | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |
| $\sigma_8$                               | $0.809^{+0.018}_{-0.017}$       | $H(0.15)$                             | $73.0^{+1.1}_{-1.1}$            | $\chi_{\mathrm{CMB}}^2$     | $7484.4 (\nu: 15.1)$         |
| $S_8$                                    | $0.821^{+0.030}_{-0.029}$       | $D_{\mathrm{M}}(0.15)$                | $640^{+11}_{-10}$               |                             |                              |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.450^{+0.016}_{-0.016}$       | $H(0.38)$                             | $83.07^{+0.87}_{-0.86}$         |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7498.14$ ;  $\Delta \bar{\chi}_{\mathrm{eff}}^2 = 0.82$ ;  $R - 1 = 0.01531$



## 16.7 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                              | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$               | $0.02213^{+0.00054}_{-0.00053}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.457^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$      | $646^{+14}_{-15}$            |
| $\Omega_{\mathrm{c}}h^2$               | $0.1201^{+0.0030}_{-0.0031}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.609^{+0.015}_{-0.015}$       | $H(0.38)$                   | $82.6^{+1.2}_{-1.1}$         |
| $100\theta_{\mathrm{MC}}$              | $1.0408^{+0.0017}_{-0.0016}$    | $\sigma_8/h^{0.5}$                   | $0.990^{+0.021}_{-0.021}$       | $D_{\mathrm{M}}(0.38)$      | $1539^{+29}_{-31}$           |
| $\tau$                                 | $0.054^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}}h$                 | $98.8^{+2.7}_{-2.5}$            | $H(0.51)$                   | $89.4^{+1.0}_{-0.94}$        |
| $Y_{\mathrm{P}}$                       | $0.242^{+0.040}_{-0.042}$       | $\langle d^2 \rangle^{1/2}$          | $2.449^{+0.056}_{-0.057}$       | $D_{\mathrm{M}}(0.51)$      | $1993^{+34}_{-37}$           |
| $\ln(10^{10}A_{\mathrm{s}})$           | $3.041^{+0.029}_{-0.027}$       | $z_{\mathrm{re}}$                    | $< 8.89$                        | $H(0.61)$                   | $95.06^{+0.90}_{-0.82}$      |
| $n_{\mathrm{s}}$                       | $0.963^{+0.019}_{-0.019}$       | $10^9 A_{\mathrm{s}}$                | $2.094^{+0.062}_{-0.057}$       | $D_{\mathrm{M}}(0.61)$      | $2318^{+38}_{-40}$           |
| $y_{\mathrm{cal}}$                     | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.027}_{-0.027}$       | $H(2.33)$                   | $236.4^{+1.8}_{-1.8}$        |
| $A_{100}^{\mathrm{PS}}$                | $241^{+50}_{-50}$               | $D_{40}$                             | $1231^{+37}_{-37}$              | $D_{\mathrm{M}}(2.33)$      | $5776^{+43}_{-45}$           |
| $A_{143}^{\mathrm{PS}}$                | $40^{+20}_{-20}$                | $D_{220}$                            | $5707^{+82}_{-81}$              | $f\sigma_8(0.15)$           | $0.461^{+0.016}_{-0.016}$    |
| $A_{217}^{\mathrm{PS}}$                | $101^{+20}_{-30}$               | $D_{810}$                            | $2533^{+27}_{-27}$              | $\sigma_8(0.15)$            | $0.748^{+0.014}_{-0.013}$    |
| $A_{217}^{\mathrm{CIB}}$               | $41^{+20}_{-10}$                | $D_{1420}$                           | $815^{+10}_{-10}$               | $f\sigma_8(0.38)$           | $0.478^{+0.012}_{-0.013}$    |
| $A_{143}^{\mathrm{tSZ}}$               | $< 7.48$                        | $D_{2000}$                           | $230.0^{+4.9}_{-4.9}$           | $\sigma_8(0.38)$            | $0.663^{+0.013}_{-0.012}$    |
| $r_{143\times 217}^{\mathrm{PS}}$      | $0.65^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.963^{+0.019}_{-0.019}$       | $f\sigma_8(0.51)$           | $0.476^{+0.011}_{-0.011}$    |
| $r_{143\times 217}^{\mathrm{CIB}}$     | —                               | $Y_{\mathrm{P}}$                     | $0.242^{+0.040}_{-0.042}$       | $\sigma_8(0.51)$            | $0.620^{+0.013}_{-0.011}$    |
| $\xi^{\mathrm{tSZ}\times\mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.243^{+0.040}_{-0.042}$       | $f\sigma_8(0.61)$           | $0.4704^{+0.0096}_{-0.0097}$ |
| $A^{\mathrm{kSZ}}$                     | —                               | Age/Gyr                              | $13.827^{+0.099}_{-0.10}$       | $\sigma_8(0.61)$            | $0.590^{+0.012}_{-0.011}$    |
| $A_{100}^{\mathrm{dust}}$              | $1.01^{+0.38}_{-0.39}$          | $z_*$                                | $1090.1^{+1.3}_{-1.3}$          | $f\sigma_8(2.33)$           | $0.2971^{+0.0062}_{-0.0061}$ |
| $A_{143}^{\mathrm{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $r_*$                                | $144.59^{+0.76}_{-0.76}$        | $\sigma_8(2.33)$            | $0.3061^{+0.0069}_{-0.0067}$ |
| $A_{217}^{\mathrm{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                        | $1.04106^{+0.00092}_{-0.00093}$ | $f_{2000}^{143}$            | $30^{+8}_{-8}$               |
| $A_{143\times 217}^{\mathrm{dust}}$    | $1.03^{+0.33}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.889^{+0.072}_{-0.073}$      | $f_{2000}^{217}$            | $107.2^{+5.5}_{-5.5}$        |
| $c_{100}$                              | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                  | $1059.3^{+2.3}_{-2.3}$          | $f_{2000}^{143\times 217}$  | $33^{+6}_{-6}$               |
| $c_{217}$                              | $1.0012^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                  | $147.33^{+0.80}_{-0.82}$        | $\chi_{\mathrm{lensing}}^2$ | $9.48\ (\nu: 0.4)$           |
| $H_0$                                  | $67.1^{+1.7}_{-1.6}$            | $k_{\mathrm{D}}$                     | $0.1406^{+0.0013}_{-0.0013}$    | $\chi_{\mathrm{simall}}^2$  | $396.9\ (\nu: 1.4)$          |
| $\Omega_{\Lambda}$                     | $0.682^{+0.021}_{-0.021}$       | $100\theta_{\mathrm{D}}$             | $0.1609^{+0.0016}_{-0.0016}$    | $\chi_{\mathrm{lowl}}^2$    | $23.8\ (\nu: 1.5)$           |
| $\Omega_{\mathrm{m}}$                  | $0.318^{+0.021}_{-0.021}$       | $z_{\mathrm{eq}}$                    | $3400^{+68}_{-69}$              | $\chi_{\mathrm{CamSpec}}^2$ | $7063.4\ (\nu: 14.5)$        |
| $\Omega_{\mathrm{m}}h^2$               | $0.1429^{+0.0028}_{-0.0029}$    | $k_{\mathrm{eq}}$                    | $0.01038^{+0.00021}_{-0.00021}$ | $\chi_{\mathrm{prior}}^2$   | $7.5\ (\nu: 5.9)$            |
| $\Omega_{\mathrm{m}}h^3$               | $0.0958^{+0.0015}_{-0.0015}$    | $100\theta_{\mathrm{eq}}$            | $0.813^{+0.014}_{-0.013}$       | $\chi_{\mathrm{CMB}}^2$     | $7493.5\ (\nu: 15.5)$        |
| $\sigma_8$                             | $0.811^{+0.015}_{-0.014}$       | $100\theta_{\mathrm{s,eq}}$          | $0.4494^{+0.0069}_{-0.0065}$    |                             |                              |
| $S_8$                                  | $0.835^{+0.032}_{-0.032}$       | $H(0.15)$                            | $72.4^{+1.5}_{-1.4}$            |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 7501.05; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 1.04; R - 1 = 0.00841$$



16.8 base\_yhe\_CamSpecHM\_TT\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02226^{+0.00047}_{-0.00048}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$      | $1529^{+20}_{-20}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1191^{+0.0021}_{-0.0021}$    | $\sigma_8/h^{0.5}$                    | $0.985^{+0.019}_{-0.018}$       | $H(0.51)$                   | $89.71^{+0.75}_{-0.73}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0411^{+0.0015}_{-0.0015}$    | $r_{\mathrm{drag}} h$                 | $99.8^{+1.7}_{-1.7}$            | $D_{\mathrm{M}}(0.51)$      | $1981^{+25}_{-25}$           |
| $\tau$                                   | $0.056^{+0.013}_{-0.013}$       | $\langle d^2 \rangle^{1/2}$           | $2.433^{+0.046}_{-0.045}$       | $H(0.61)$                   | $95.32^{+0.70}_{-0.68}$      |
| $Y_{\mathrm{P}}$                         | $0.248^{+0.036}_{-0.037}$       | $z_{\mathrm{re}}$                     | $7.9^{+1.2}_{-1.4}$             | $D_{\mathrm{M}}(0.61)$      | $2305^{+27}_{-27}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.046^{+0.029}_{-0.028}$       | $10^9 A_{\mathrm{s}}$                 | $2.103^{+0.062}_{-0.059}$       | $H(2.33)$                   | $235.9^{+1.4}_{-1.4}$        |
| $n_{\mathrm{s}}$                         | $0.968^{+0.016}_{-0.016}$       | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.878^{+0.027}_{-0.026}$       | $D_{\mathrm{M}}(2.33)$      | $5764^{+36}_{-37}$           |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0048}_{-0.0047}$    | $D_{40}$                              | $1223^{+32}_{-33}$              | $f\sigma_8(0.15)$           | $0.456^{+0.012}_{-0.012}$    |
| $A_{100}^{\mathrm{PS}}$                  | $244^{+50}_{-50}$               | $D_{220}$                             | $5715^{+79}_{-81}$              | $\sigma_8(0.15)$            | $0.749^{+0.014}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $41^{+20}_{-20}$                | $D_{810}$                             | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.475^{+0.011}_{-0.010}$    |
| $A_{217}^{\mathrm{PS}}$                  | $101^{+30}_{-30}$               | $D_{1420}$                            | $815^{+10}_{-10}$               | $\sigma_8(0.38)$            | $0.664^{+0.013}_{-0.012}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $41^{+20}_{-10}$                | $D_{2000}$                            | $229.8^{+4.7}_{-4.8}$           | $f\sigma_8(0.51)$           | $0.4734^{+0.0098}_{-0.0095}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.48$                        | $n_{\mathrm{s},0.002}$                | $0.968^{+0.016}_{-0.016}$       | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.65^{+0.26}_{-0.25}$          | $Y_{\mathrm{P}}$                      | $0.248^{+0.036}_{-0.037}$       | $f\sigma_8(0.61)$           | $0.4685^{+0.0092}_{-0.0089}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.249^{+0.037}_{-0.038}$       | $\sigma_8(0.61)$            | $0.591^{+0.012}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | Age/Gyr                               | $13.799^{+0.084}_{-0.085}$      | $f\sigma_8(2.33)$           | $0.2982^{+0.0060}_{-0.0058}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | $z_*$                                 | $1090.1^{+1.3}_{-1.3}$          | $\sigma_8(2.33)$            | $0.3075^{+0.0064}_{-0.0062}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $r_*$                                 | $144.74^{+0.68}_{-0.65}$        | $f_{2000}^{143}$            | $31^{+8}_{-8}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.33}_{-0.34}$          | $100\theta_*$                         | $1.04125^{+0.00083}_{-0.00087}$ | $f_{2000}^{217}$            | $107.6^{+5.4}_{-5.3}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.901^{+0.067}_{-0.066}$      | $f_{2000}^{143 \times 217}$ | $33^{+6}_{-6}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $z_{\mathrm{drag}}$                   | $1059.7^{+2.1}_{-2.1}$          | $\chi_{\mathrm{lensing}}^2$ | $9.38 (\nu: 0.3)$            |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0022}$    | $r_{\mathrm{drag}}$                   | $147.45^{+0.77}_{-0.76}$        | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 1.9)$           |
| $c_{217}$                                | $1.0012^{+0.0030}_{-0.0031}$    | $k_{\mathrm{D}}$                      | $0.1403^{+0.0012}_{-0.0012}$    | $\chi_{\mathrm{lowl}}^2$    | $22.9 (\nu: 0.9)$            |
| $H_0$                                    | $67.7^{+1.2}_{-1.1}$            | $100\theta_{\mathrm{D}}$              | $0.1611^{+0.0015}_{-0.0015}$    | $\chi_{\mathrm{CamSpec}}^2$ | $7064.1 (\nu: 14.6)$         |
| $\Omega_{\Lambda}$                       | $0.690^{+0.013}_{-0.014}$       | $z_{\mathrm{eq}}$                     | $3378^{+51}_{-50}$              | $\chi_{6\mathrm{DF}}^2$     | $0.055 (\nu: 0.0)$           |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.014}_{-0.013}$       | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00015}_{-0.00015}$ | $\chi_{\mathrm{MGS}}^2$     | $1.34 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}} h^2$                | $0.1420^{+0.0021}_{-0.0021}$    | $100\theta_{\mathrm{eq}}$             | $0.8176^{+0.0091}_{-0.0092}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 1.2)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.0961^{+0.0014}_{-0.0014}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4517^{+0.0047}_{-0.0048}$    | $\chi_{\mathrm{prior}}^2$   | $7.6 (\nu: 6.1)$             |
| $\sigma_8$                               | $0.810^{+0.015}_{-0.014}$       | $H(0.15)$                             | $72.9^{+1.0}_{-1.0}$            | $\chi_{\mathrm{CMB}}^2$     | $7493.6 (\nu: 15.3)$         |
| $S_8$                                    | $0.824^{+0.024}_{-0.023}$       | $D_{\mathrm{M}}(0.15)$                | $640.9^{+9.9}_{-9.9}$           | $\chi_{\mathrm{BAO}}^2$     | $6.1 (\nu: 0.8)$             |
| $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$     | $0.451^{+0.013}_{-0.013}$       | $H(0.38)$                             | $83.01^{+0.85}_{-0.82}$         |                             |                              |

$\bar{\chi}_{\mathrm{eff}}^2 = 7507.34$ ;  $\Delta \bar{\chi}_{\mathrm{eff}}^2 = 1.01$ ;  $R - 1 = 0.01969$



## 16.9 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022312 | $0.02230^{+0.00042}_{-0.00042}$ | $\sigma_8$                  | 0.8081   | $0.808^{+0.016}_{-0.017}$       | $100\theta_{s,eq}$          | 0.4507   | $0.4504^{+0.0063}_{-0.0062}$ |
| $\Omega_c h^2$              | 0.11944  | $0.1196^{+0.0029}_{-0.0028}$    | $S_8$                       | 0.8248   | $0.826^{+0.033}_{-0.033}$       | $H(0.15)$                   | 72.79    | $72.7^{+1.3}_{-1.3}$         |
| $100\theta_{MC}$            | 1.04093  | $1.0409^{+0.0014}_{-0.0014}$    | $\sigma_8 \Omega_m^{0.5}$   | 0.4517   | $0.452^{+0.018}_{-0.018}$       | $D_M(0.15)$                 | 642.2    | $643^{+13}_{-13}$            |
| $\tau$                      | 0.0532   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6042   | $0.605^{+0.017}_{-0.017}$       | $H(0.38)$                   | 82.92    | $82.9^{+1.1}_{-1.0}$         |
| $Y_P$                       | 0.2463   | $0.246^{+0.035}_{-0.035}$       | $\sigma_8/h^{0.5}$          | 0.9835   | $0.984^{+0.024}_{-0.024}$       | $D_M(0.38)$                 | 1531.3   | $1532^{+27}_{-27}$           |
| $\ln(10^{10} A_s)$          | 3.0389   | $3.039^{+0.034}_{-0.034}$       | $r_{drag} h$                | 99.43    | $99.3^{+2.4}_{-2.4}$            | $H(0.51)$                   | 89.65    | $89.62^{+0.89}_{-0.84}$      |
| $n_s$                       | 0.9671   | $0.966^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | 2.430    | $2.433^{+0.061}_{-0.063}$       | $D_M(0.51)$                 | 1983.5   | $1985^{+31}_{-32}$           |
| $y_{cal}$                   | 1.00025  | $1.0004^{+0.0049}_{-0.0048}$    | $z_{re}$                    | 7.57     | $7.5^{+1.6}_{-1.7}$             | $H(0.61)$                   | 95.28    | $95.26^{+0.77}_{-0.72}$      |
| $A_{100}^{PS}$              | 232      | $240^{+50}_{-50}$               | $10^9 A_s$                  | 2.088    | $2.088^{+0.073}_{-0.070}$       | $D_M(0.61)$                 | 2307.9   | $2309^{+34}_{-35}$           |
| $A_{143}^{PS}$              | 41.4     | $40^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8777   | $1.879^{+0.026}_{-0.025}$       | $H(2.33)$                   | 236.14   | $236.2^{+1.7}_{-1.6}$        |
| $A_{217}^{PS}$              | 102.7    | $102^{+30}_{-30}$               | $D_{40}$                    | 1223.0   | $1226^{+34}_{-35}$              | $D_M(2.33)$                 | 5764.8   | $5766^{+36}_{-38}$           |
| $A_{217}^{CIB}$             | 44.1     | $40^{+20}_{-10}$                | $D_{220}$                   | 5714     | $5718^{+76}_{-77}$              | $f\sigma_8(0.15)$           | 0.4562   | $0.457^{+0.017}_{-0.017}$    |
| $A_{143}^{tSZ}$             | 6.67     | $< 7.44$                        | $D_{810}$                   | 2534.5   | $2535^{+27}_{-26}$              | $\sigma_8(0.15)$            | 0.7466   | $0.747^{+0.015}_{-0.015}$    |
| $r_{143 \times 217}^{PS}$   | 0.625    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | 815.7    | $816^{+10}_{-10}$               | $f\sigma_8(0.38)$           | 0.4743   | $0.475^{+0.013}_{-0.014}$    |
| $r_{143 \times 217}^{CIB}$  | 0.80     | —                               | $D_{2000}$                  | 230.22   | $230.1^{+4.4}_{-4.4}$           | $\sigma_8(0.38)$            | 0.6617   | $0.662^{+0.013}_{-0.013}$    |
| $\xi^{tSZ \times CIB}$      | 0.21     | —                               | $n_{s,0.002}$               | 0.9671   | $0.966^{+0.017}_{-0.016}$       | $f\sigma_8(0.51)$           | 0.4728   | $0.473^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | 0.0      | —                               | $Y_P$                       | 0.2463   | $0.246^{+0.035}_{-0.035}$       | $\sigma_8(0.51)$            | 0.6192   | $0.619^{+0.013}_{-0.013}$    |
| $A_{100}^{dust}$            | 1.008    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.2477   | $0.247^{+0.035}_{-0.035}$       | $f\sigma_8(0.61)$           | 0.4677   | $0.468^{+0.011}_{-0.011}$    |
| $A_{143}^{dust}$            | 0.979    | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                     | 13.801   | $13.803^{+0.083}_{-0.087}$      | $\sigma_8(0.61)$            | 0.5891   | $0.589^{+0.012}_{-0.012}$    |
| $A_{217}^{dust}$            | 0.973    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1089.98  | $1090.0^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | 0.2970   | $0.2969^{+0.0064}_{-0.0063}$ |
| $A_{143 \times 217}^{dust}$ | 1.008    | $1.03^{+0.32}_{-0.31}$          | $r_*$                       | 144.62   | $144.59^{+0.64}_{-0.65}$        | $\sigma_8(2.33)$            | 0.3062   | $0.3060^{+0.0069}_{-0.0067}$ |
| $c_{100}$                   | 0.99764  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04109  | $1.04107^{+0.00069}_{-0.00068}$ | $f_{2000}^{143}$            | 30.0     | $30^{+7}_{-8}$               |
| $c_{217}$                   | 1.00130  | $1.0012^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.891   | $13.889^{+0.061}_{-0.062}$      | $f_{2000}^{217}$            | 106.8    | $107.0^{+5.1}_{-5.1}$        |
| $c_{TE}$                    | 0.9968   | $0.997^{+0.011}_{-0.010}$       | $z_{drag}$                  | 1059.78  | $1059.8^{+1.9}_{-1.9}$          | $f_{2000}^{143 \times 217}$ | 32.2     | $32^{+6}_{-6}$               |
| $c_{EE}$                    | 0.9923   | $0.992^{+0.013}_{-0.013}$       | $r_{drag}$                  | 147.30   | $147.28^{+0.66}_{-0.67}$        | $\chi_{small}^2$            | 395.88   | $396.9 (\nu: 1.5)$           |
| $H_0$                       | 67.50    | $67.4^{+1.5}_{-1.5}$            | $k_D$                       | 0.14056  | $0.1406^{+0.0011}_{-0.0011}$    | $\chi_{lowl}^2$             | 22.85    | $23.2 (\nu: 1.0)$            |
| $\Omega_\Lambda$            | 0.6875   | $0.686^{+0.019}_{-0.020}$       | $100\theta_D$               | 0.16090  | $0.1609^{+0.0014}_{-0.0013}$    | $\chi_{CamSpec}^2$          | 11499.8  | $11515.4 (\nu: 17.0)$        |
| $\Omega_m$                  | 0.3125   | $0.314^{+0.020}_{-0.019}$       | $z_{eq}$                    | 3388     | $3391^{+63}_{-62}$              | $\chi_{prior}^2$            | 2.2      | $7.9 (\nu: 6.0)$             |
| $\Omega_m h^2$              | 0.14240  | $0.1425^{+0.0026}_{-0.0026}$    | $k_{eq}$                    | 0.010339 | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{CMB}^2$              | 11918.5  | $11935.5 (\nu: 17.2)$        |
| $\Omega_m h^3$              | 0.09612  | $0.0961^{+0.0012}_{-0.0012}$    | $100\theta_{eq}$            | 0.8158   | $0.815^{+0.012}_{-0.012}$       |                             |          |                              |

Best-fit  $\chi_{eff}^2 = 11920.73$ ;  $\Delta\chi_{eff}^2 = -0.03$ ;  $\bar{\chi}_{eff}^2 = 11943.34$ ;  $\Delta\bar{\chi}_{eff}^2 = 0.88$ ;  $R - 1 = 0.01242$

$\chi_{eff}^2$ : CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 395.88 ( $\Delta$  -0.02) commander\_dx12\_v3\_2\_29: 22.85 ( $\Delta$  -0.15) CamSpec like\_10.7HM\_1400\_unified: 11499.82 ( $\Delta$  0.17)



# 16.10 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02237^{+0.00036}_{-0.00036}$ | $S_8$                       | $0.819^{+0.026}_{-0.026}$       | $D_M(0.15)$                 | $639.7^{+9.0}_{-9.3}$        |
| $\Omega_c h^2$                       | $0.1189^{+0.0020}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.12^{+0.78}_{-0.73}$      |
| $100\theta_{MC}$                     | $1.0411^{+0.0013}_{-0.0012}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.602^{+0.015}_{-0.015}$       | $D_M(0.38)$                 | $1526^{+18}_{-19}$           |
| $\tau$                               | $0.054^{+0.016}_{-0.016}$       | $\sigma_8/h^{0.5}$          | $0.980^{+0.022}_{-0.022}$       | $H(0.51)$                   | $89.81^{+0.69}_{-0.63}$      |
| $Y_P$                                | $0.250^{+0.032}_{-0.032}$       | $r_{\text{drag}} h$         | $99.9^{+1.7}_{-1.6}$            | $D_M(0.51)$                 | $1977^{+22}_{-23}$           |
| $\ln(10^{10} A_s)$                   | $3.040^{+0.035}_{-0.035}$       | $\langle d^2 \rangle^{1/2}$ | $2.421^{+0.053}_{-0.053}$       | $H(0.61)$                   | $95.41^{+0.61}_{-0.57}$      |
| $n_s$                                | $0.969^{+0.015}_{-0.014}$       | $z_{\text{re}}$             | $7.6^{+1.6}_{-1.7}$             | $D_M(0.61)$                 | $2301^{+24}_{-25}$           |
| $y_{\text{cal}}$                     | $1.0005^{+0.0049}_{-0.0048}$    | $10^9 A_s$                  | $2.091^{+0.073}_{-0.073}$       | $H(2.33)$                   | $235.9^{+1.3}_{-1.3}$        |
| $A_{100}^{\text{PS}}$                | $242^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.026}_{-0.025}$       | $D_M(2.33)$                 | $5759^{+30}_{-31}$           |
| $A_{143}^{\text{PS}}$                | $40^{+20}_{-20}$                | $D_{40}$                    | $1220^{+31}_{-31}$              | $f\sigma_8(0.15)$           | $0.453^{+0.013}_{-0.014}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                   | $5721^{+77}_{-76}$              | $\sigma_8(0.15)$            | $0.746^{+0.015}_{-0.015}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+20}_{-10}$                | $D_{810}$                   | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.472^{+0.012}_{-0.012}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.33$                        | $D_{1420}$                  | $815.5^{+9.8}_{-9.9}$           | $\sigma_8(0.38)$            | $0.662^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\text{PS}}$     | $0.65^{+0.25}_{-0.25}$          | $D_{2000}$                  | $229.9^{+4.4}_{-4.4}$           | $f\sigma_8(0.51)$           | $0.471^{+0.011}_{-0.011}$    |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.969^{+0.015}_{-0.014}$       | $\sigma_8(0.51)$            | $0.619^{+0.013}_{-0.013}$    |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.250^{+0.032}_{-0.032}$       | $f\sigma_8(0.61)$           | $0.466^{+0.010}_{-0.011}$    |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.251^{+0.032}_{-0.032}$       | $\sigma_8(0.61)$            | $0.589^{+0.012}_{-0.012}$    |
| $A_{100}^{\text{dust}}$              | $1.01^{+0.39}_{-0.39}$          | Age/Gyr                     | $13.787^{+0.070}_{-0.071}$      | $f\sigma_8(2.33)$           | $0.2973^{+0.0064}_{-0.0061}$ |
| $A_{143}^{\text{dust}}$              | $0.97^{+0.34}_{-0.34}$          | $z_*$                       | $1090.0^{+1.2}_{-1.1}$          | $\sigma_8(2.33)$            | $0.3067^{+0.0067}_{-0.0065}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.69^{+0.57}_{-0.58}$        | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04118^{+0.00062}_{-0.00063}$ | $f_{2000}^{217}$            | $107.3^{+4.9}_{-5.0}$        |
| $c_{100}$                            | $0.9975^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.897^{+0.056}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-6}$               |
| $c_{217}$                            | $1.0012^{+0.0031}_{-0.0030}$    | $z_{\text{drag}}$           | $1060.0^{+1.8}_{-1.7}$          | $\chi_{\text{simall}}^2$    | $397.0 (\nu: 1.7)$           |
| $c_{TE}$                             | $0.997^{+0.011}_{-0.010}$       | $r_{\text{drag}}$           | $147.36^{+0.62}_{-0.63}$        | $\chi_{\text{lowl}}^2$      | $22.7 (\nu: 0.7)$            |
| $c_{EE}$                             | $0.994^{+0.013}_{-0.012}$       | $k_D$                       | $0.14039^{+0.00099}_{-0.0010}$  | $\chi_{\text{CamSpec}}^2$   | $11515.5 (\nu: 16.4)$        |
| $H_0$                                | $67.8^{+1.1}_{-1.0}$            | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6\text{DF}}^2$       | $0.044 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.691^{+0.013}_{-0.013}$       | $z_{\text{eq}}$             | $3377^{+45}_{-47}$              | $\chi_{\text{MGS}}^2$       | $1.42 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.309^{+0.013}_{-0.013}$       | $k_{\text{eq}}$             | $0.01031^{+0.00014}_{-0.00014}$ | $\chi_{\text{DR12BAO}}^2$   | $4.5 (\nu: 0.8)$             |
| $\Omega_m h^2$                       | $0.1419^{+0.0019}_{-0.0020}$    | $100\theta_{\text{eq}}$     | $0.8181^{+0.0090}_{-0.0084}$    | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 6.0)$             |
| $\Omega_m h^3$                       | $0.0962^{+0.0011}_{-0.0011}$    | $100\theta_{s,\text{eq}}$   | $0.4519^{+0.0046}_{-0.0043}$    | $\chi_{\text{BAO}}^2$       | $6.0 (\nu: 0.5)$             |
| $\sigma_8$                           | $0.807^{+0.017}_{-0.017}$       | $H(0.15)$                   | $73.05^{+0.96}_{-0.91}$         | $\chi_{\text{CMB}}^2$       | $11935.2 (\nu: 16.5)$        |

$$\bar{\chi}_{\text{eff}}^2 = 11949.00; \Delta\bar{\chi}_{\text{eff}}^2 = 0.71; R - 1 = 0.01838$$



### 16.11 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing

| Parameter   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|---|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$  | $0.02228^{+0.00040}_{-0.00041}$ | $\sigma_8$                  | $0.809^{+0.014}_{-0.014}$       | $100\theta_{s,eq}$          | $0.4501^{+0.0054}_{-0.0053}$ |
| $\Omega_c h^2$  | $0.1197^{+0.0024}_{-0.0024}$    | $S_8$                       | $0.828^{+0.026}_{-0.025}$       | $H(0.15)$                   | $72.7^{+1.2}_{-1.2}$         |
| $100\theta_{MC}$  | $1.0408^{+0.0014}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $643^{+12}_{-12}$            |
| $\tau$  | $0.054^{+0.015}_{-0.015}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.013}_{-0.013}$       | $H(0.38)$                   | $82.83^{+0.97}_{-0.92}$      |
| $Y_P$   | $0.244^{+0.034}_{-0.035}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | $1534^{+24}_{-25}$           |
| $\ln(10^{10} A_s)$  | $3.041^{+0.032}_{-0.030}$       | $r_{drag} h$                | $99.2^{+2.2}_{-2.1}$            | $H(0.51)$                   | $89.57^{+0.82}_{-0.79}$      |
| $n_s$   | $0.965^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | $2.439^{+0.047}_{-0.049}$       | $D_M(0.51)$                 | $1987^{+29}_{-29}$           |
| $y_{cal}$   | $1.0006^{+0.0048}_{-0.0047}$    | $z_{re}$                    | $7.6^{+1.5}_{-1.5}$             | $H(0.61)$                   | $95.21^{+0.71}_{-0.68}$      |
| $A_{100}^{PS}$  | $240^{+50}_{-50}$               | $10^9 A_s$                  | $2.092^{+0.068}_{-0.063}$       | $D_M(0.61)$                 | $2311^{+31}_{-32}$           |
| $A_{143}^{PS}$  | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.025}_{-0.024}$       | $H(2.33)$                   | $236.3^{+1.5}_{-1.4}$        |
| $A_{217}^{PS}$  | $102^{+30}_{-30}$               | $D_{40}$                    | $1229^{+32}_{-33}$              | $D_M(2.33)$                 | $5768^{+35}_{-36}$           |
| $A_{217}^{CIB}$   | $40^{+20}_{-10}$                | $D_{220}$                   | $5721^{+77}_{-77}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{143}^{tSZ}$   | $< 7.41$                        | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.26}$          | $D_{1420}$                  | $815.9^{+9.8}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.4^{+4.3}_{-4.4}$           | $\sigma_8(0.38)$            | $0.662^{+0.013}_{-0.012}$    |
| $\xi^{tSZ \times CIB}$  | —                               | $n_{s,0.002}$               | $0.965^{+0.017}_{-0.016}$       | $f\sigma_8(0.51)$           | $0.4738^{+0.0092}_{-0.0093}$ |
| $A^{kSZ}$   | —                               | $Y_P$                       | $0.244^{+0.034}_{-0.035}$       | $\sigma_8(0.51)$            | $0.619^{+0.012}_{-0.012}$    |
| $A_{100}^{dust}$  | $1.01^{+0.38}_{-0.39}$          | $Y_P^{BBN}$                 | $0.245^{+0.034}_{-0.035}$       | $f\sigma_8(0.61)$           | $0.4686^{+0.0086}_{-0.0087}$ |
| $A_{143}^{dust}$  | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                     | $13.808^{+0.081}_{-0.083}$      | $\sigma_8(0.61)$            | $0.589^{+0.012}_{-0.011}$    |
| $A_{217}^{dust}$  | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1090.0^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | $0.2970^{+0.0062}_{-0.0059}$ |
| $A_{143 \times 217}^{dust}$   | $1.02^{+0.32}_{-0.31}$          | $r_*$                       | $144.58^{+0.58}_{-0.59}$        | $\sigma_8(2.33)$            | $0.3061^{+0.0068}_{-0.0065}$ |
| $c_{100}$   | $0.9975^{+0.0020}_{-0.0020}$    | $100\theta_*$               | $1.04104^{+0.00066}_{-0.00066}$ | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $c_{217}$   | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.888^{+0.056}_{-0.057}$      | $f_{2000}^{217}$            | $106.8^{+5.1}_{-5.1}$        |
| $c_{TE}$  | $0.996^{+0.011}_{-0.010}$       | $z_{drag}$                  | $1059.7^{+1.9}_{-1.8}$          | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$               |
| $c_{EE}$  | $0.992^{+0.013}_{-0.013}$       | $r_{drag}$                  | $147.27^{+0.62}_{-0.63}$        | $\chi_{lensing}^2$          | $9.29 (\nu: 0.3)$            |
| $H_0$   | $67.4^{+1.4}_{-1.4}$            | $k_D$                       | $0.1407^{+0.0011}_{-0.0011}$    | $\chi_{simall}^2$           | $396.9 (\nu: 1.4)$           |
| $\Omega_\Lambda$  | $0.685^{+0.017}_{-0.017}$       | $100\theta_D$               | $0.1608^{+0.0014}_{-0.0013}$    | $\chi_{lowl}^2$             | $23.4 (\nu: 1.0)$            |
| $\Omega_m$  | $0.315^{+0.017}_{-0.017}$       | $z_{eq}$                    | $3393^{+55}_{-53}$              | $\chi_{CamSpec}^2$          | $11514.7 (\nu: 15.9)$        |
| $\Omega_m h^2$  | $0.1426^{+0.0023}_{-0.0022}$    | $k_{eq}$                    | $0.01036^{+0.00017}_{-0.00016}$ | $\chi_{prior}^2$            | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^3$  | $0.0961^{+0.0012}_{-0.0011}$    | $100\theta_{eq}$            | $0.815^{+0.011}_{-0.010}$       | $\chi_{CMB}^2$              | $11944.3 (\nu: 17.1)$        |
| $\bar{\chi}_{eff}^2 = 11952.12; \Delta\bar{\chi}_{eff}^2 = 0.68; R - 1 = 0.01489$ |                                 |                             |                                 |                             |                              |



## 16.12 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02236^{+0.00036}_{-0.00036}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.011}_{-0.012}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+18}_{-19}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1191^{+0.0018}_{-0.0019}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.012}$       | $H(0.51)$                   | $89.76^{+0.66}_{-0.61}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0410^{+0.0013}_{-0.0012}$    | $\sigma_8/h^{0.5}$                    | $0.983^{+0.018}_{-0.017}$       | $D_{\mathrm{M}}(0.51)$      | $1979^{+21}_{-22}$           |
| $\tau$                                   | $0.055^{+0.015}_{-0.014}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.6}_{-1.5}$            | $H(0.61)$                   | $95.37^{+0.59}_{-0.55}$      |
| $Y_{\mathrm{P}}$                         | $0.248^{+0.032}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$           | $2.430^{+0.043}_{-0.044}$       | $D_{\mathrm{M}}(0.61)$      | $2303^{+23}_{-25}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.044^{+0.032}_{-0.030}$       | $z_{\mathrm{re}}$                     | $7.8^{+1.5}_{-1.4}$             | $H(2.33)$                   | $236.0^{+1.2}_{-1.2}$        |
| $n_{\mathrm{s}}$                         | $0.968^{+0.015}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.067}_{-0.061}$       | $D_{\mathrm{M}}(2.33)$      | $5760^{+29}_{-30}$           |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.025}_{-0.024}$       | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{40}$                              | $1224^{+30}_{-30}$              | $\sigma_8(0.15)$            | $0.748^{+0.014}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                             | $5725^{+75}_{-75}$              | $f\sigma_8(0.38)$           | $0.4738^{+0.0095}_{-0.0095}$ |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2536^{+27}_{-26}$              | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.012}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+20}_{-10}$                | $D_{1420}$                            | $816.0^{+9.7}_{-9.8}$           | $f\sigma_8(0.51)$           | $0.4726^{+0.0089}_{-0.0089}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.37$                        | $D_{2000}$                            | $230.2^{+4.4}_{-4.4}$           | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.968^{+0.015}_{-0.013}$       | $f\sigma_8(0.61)$           | $0.4678^{+0.0085}_{-0.0086}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.248^{+0.032}_{-0.032}$       | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.011}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.250^{+0.032}_{-0.033}$       | $f\sigma_8(2.33)$           | $0.2978^{+0.0059}_{-0.0055}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.791^{+0.068}_{-0.070}$      | $\sigma_8(2.33)$            | $0.3071^{+0.0064}_{-0.0060}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $z_*$                                 | $1090.0^{+1.1}_{-1.1}$          | $f_{2000}^{143}$            | $30^{+7}_{-8}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $r_*$                                 | $144.67^{+0.53}_{-0.55}$        | $f_{2000}^{217}$            | $107.1^{+4.9}_{-5.1}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                         | $1.04115^{+0.00061}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-6}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.31}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.895^{+0.054}_{-0.055}$      | $\chi_{\mathrm{lensing}}^2$ | $9.33 (\nu: 0.3)$            |
| $c_{100}$                                | $0.9976^{+0.0020}_{-0.0020}$    | $z_{\mathrm{drag}}$                   | $1059.9^{+1.7}_{-1.7}$          | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.7)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                   | $147.34^{+0.59}_{-0.61}$        | $\chi_{\mathrm{lowl}}^2$    | $22.9 (\nu: 0.7)$            |
| $c_{TE}$                                 | $0.997^{+0.011}_{-0.010}$       | $k_{\mathrm{D}}$                      | $0.14047^{+0.00096}_{-0.00098}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.8 (\nu: 15.8)$        |
| $c_{EE}$                                 | $0.993^{+0.013}_{-0.012}$       | $100\theta_{\mathrm{D}}$              | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6\mathrm{DF}}^2$     | $0.048 (\nu: 0.0)$           |
| $H_0$                                    | $67.7^{+1.1}_{-0.99}$           | $z_{\mathrm{eq}}$                     | $3380^{+42}_{-42}$              | $\chi_{\mathrm{MGS}}^2$     | $1.34 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01032^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 0.9)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.8174^{+0.0081}_{-0.0078}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1421^{+0.0018}_{-0.0018}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4515^{+0.0041}_{-0.0040}$    | $\chi_{\mathrm{CMB}}^2$     | $11944.2 (\nu: 16.6)$        |
| $\Omega_{\mathrm{m}} h^3$                | $0.0962^{+0.0011}_{-0.0011}$    | $H(0.15)$                             | $72.98^{+0.94}_{-0.87}$         | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.5)$             |
| $\sigma_8$                               | $0.809^{+0.014}_{-0.014}$       | $D_{\mathrm{M}}(0.15)$                | $640.4^{+8.6}_{-9.0}$           |                             |                              |
| $S_8$                                    | $0.822^{+0.021}_{-0.021}$       | $H(0.38)$                             | $83.06^{+0.75}_{-0.70}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.04; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.63; R - 1 = 0.02077$$



### 16.13 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18

| Parameter  | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$  | $0.02255^{+0.00042}_{-0.00040}$ | $\sigma_8$                            | $0.807^{+0.017}_{-0.017}$       | $100\theta_{\mathrm{s,eq}}$ | $0.4545^{+0.0058}_{-0.0059}$ |
| $\Omega_{\mathrm{c}} h^2$  | $0.1178^{+0.0027}_{-0.0026}$    | $S_8$                                 | $0.807^{+0.030}_{-0.030}$       | $H(0.15)$                   | $73.7^{+1.2}_{-1.2}$         |
| $100\theta_{\mathrm{MC}}$  | $1.0416^{+0.0012}_{-0.0013}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.442^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.15)$      | $633^{+12}_{-11}$            |
| $\tau$   | $0.056^{+0.018}_{-0.017}$       | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.597^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.63^{+0.96}_{-0.96}$      |
| $Y_{\mathrm{P}}$   | $0.261^{+0.031}_{-0.034}$       | $\sigma_8/h^{0.5}$                    | $0.975^{+0.023}_{-0.023}$       | $D_{\mathrm{M}}(0.38)$      | $1513^{+25}_{-23}$           |
| $\ln(10^{10} A_{\mathrm{s}})$  | $3.044^{+0.035}_{-0.036}$       | $r_{\mathrm{drag}} h$                 | $101.1^{+2.3}_{-2.2}$           | $H(0.51)$                   | $90.24^{+0.83}_{-0.82}$      |
| $n_{\mathrm{s}}$   | $0.976^{+0.015}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$           | $2.398^{+0.061}_{-0.057}$       | $D_{\mathrm{M}}(0.51)$      | $1962^{+29}_{-28}$           |
| $y_{\mathrm{cal}}$   | $1.0006^{+0.0046}_{-0.0047}$    | $z_{\mathrm{re}}$                     | $7.8^{+1.8}_{-1.8}$             | $H(0.61)$                   | $95.78^{+0.74}_{-0.71}$      |
| $A_{100}^{\mathrm{PS}}$  | $244^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.074}_{-0.074}$       | $D_{\mathrm{M}}(0.61)$      | $2285^{+32}_{-30}$           |
| $A_{143}^{\mathrm{PS}}$  | $42^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.025}_{-0.025}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.5}$        |
| $A_{217}^{\mathrm{PS}}$  | $101^{+30}_{-30}$               | $D_{40}$                              | $1208^{+32}_{-31}$              | $D_{\mathrm{M}}(2.33)$      | $5741^{+35}_{-33}$           |
| $A_{217}^{\mathrm{CIB}}$   | $41^{+10}_{-10}$                | $D_{220}$                             | $5727^{+69}_{-74}$              | $f\sigma_8(0.15)$           | $0.447^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$   | $< 7.24$                        | $D_{810}$                             | $2537^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.015}_{-0.016}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$   | $0.65^{+0.24}_{-0.25}$          | $D_{1420}$                            | $815.5^{+9.7}_{-9.6}$           | $f\sigma_8(0.38)$           | $0.468^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$  | —                               | $D_{2000}$                            | $229.3^{+4.6}_{-4.3}$           | $\sigma_8(0.38)$            | $0.663^{+0.014}_{-0.014}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$   | —                               | $n_{\mathrm{s},0.002}$                | $0.976^{+0.015}_{-0.016}$       | $f\sigma_8(0.51)$           | $0.468^{+0.012}_{-0.011}$    |
| $A^{\mathrm{kSZ}}$   | —                               | $Y_{\mathrm{P}}$                      | $0.261^{+0.031}_{-0.034}$       | $\sigma_8(0.51)$            | $0.621^{+0.013}_{-0.013}$    |
| $A_{100}^{\mathrm{dust}}$  | $1.01^{+0.39}_{-0.39}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.262^{+0.031}_{-0.034}$       | $f\sigma_8(0.61)$           | $0.464^{+0.011}_{-0.011}$    |
| $A_{143}^{\mathrm{dust}}$  | $0.97^{+0.32}_{-0.34}$          | Age/Gyr                               | $13.748^{+0.080}_{-0.077}$      | $\sigma_8(0.61)$            | $0.591^{+0.012}_{-0.012}$    |
| $A_{217}^{\mathrm{dust}}$  | $0.97^{+0.19}_{-0.19}$          | $z_*$                                 | $1090.1^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | $0.2986^{+0.0063}_{-0.0062}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$   | $1.04^{+0.32}_{-0.30}$          | $r_*$                                 | $144.82^{+0.62}_{-0.62}$        | $\sigma_8(2.33)$            | $0.3084^{+0.0068}_{-0.0068}$ |
| $c_{100}$  | $0.9975^{+0.0020}_{-0.0020}$    | $100\theta_*$                         | $1.04140^{+0.00065}_{-0.00066}$ | $f_{2000}^{143}$            | $31^{+7}_{-7}$               |
| $c_{217}$  | $1.0013^{+0.0031}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.907^{+0.057}_{-0.059}$      | $f_{2000}^{217}$            | $108.1^{+5.1}_{-5.1}$        |
| $c_{TE}$   | $0.999^{+0.010}_{-0.011}$       | $z_{\mathrm{drag}}$                   | $1060.7^{+1.9}_{-1.8}$          | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-5}$               |
| $c_{EE}$   | $0.996^{+0.012}_{-0.013}$       | $r_{\mathrm{drag}}$                   | $147.44^{+0.65}_{-0.64}$        | $\chi_{\mathrm{simall}}^2$  | $397.2 (\nu: 2.0)$           |
| $H_0$  | $68.5^{+1.3}_{-1.4}$            | $k_{\mathrm{D}}$                      | $0.1400^{+0.0011}_{-0.0010}$    | $\chi_{\mathrm{lowl}}^2$    | $21.8 (\nu: 0.6)$            |
| $\Omega_{\Lambda}$   | $0.700^{+0.016}_{-0.017}$       | $100\theta_{\mathrm{D}}$              | $0.1614^{+0.0012}_{-0.0014}$    | $\chi_{\mathrm{CamSpec}}^2$ | $11518.2 (\nu: 20.7)$        |
| $\Omega_{\mathrm{m}}$  | $0.300^{+0.017}_{-0.016}$       | $z_{\mathrm{eq}}$                     | $3353^{+60}_{-57}$              | $\chi_{\mathrm{H073p45}}^2$ | $8.9 (\nu: 3.3)$             |
| $\Omega_{\mathrm{m}} h^2$  | $0.1409^{+0.0025}_{-0.0024}$    | $k_{\mathrm{eq}}$                     | $0.01023^{+0.00018}_{-0.00017}$ | $\chi_{\mathrm{prior}}^2$   | $7.9 (\nu: 6.2)$             |
| $\Omega_{\mathrm{m}} h^3$  | $0.0966^{+0.0012}_{-0.0012}$    | $100\theta_{\mathrm{eq}}$             | $0.823^{+0.011}_{-0.012}$       | $\chi_{\mathrm{CMB}}^2$     | $11937.2 (\nu: 19.4)$        |
| $\bar{\chi}_{\mathrm{eff}}^2 = 11954.03; \Delta\bar{\chi}_{\mathrm{eff}}^2 = -0.24; R - 1 = 0.04865$ |                                 |                                       |                                 |                             |                              |



# 16.14 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02231^{+0.00042}_{-0.00041}$ | $\sigma_8$                            | $0.809^{+0.016}_{-0.014}$       | $100\theta_{\mathrm{s,eq}}$ | $0.4505^{+0.0062}_{-0.0061}$ |
| $\Omega_{\mathrm{c}} h^2$                | $0.1195^{+0.0028}_{-0.0028}$    | $S_8$                                 | $0.827^{+0.033}_{-0.032}$       | $H(0.15)$                   | $72.8^{+1.3}_{-1.3}$         |
| $100\theta_{\mathrm{MC}}$                | $1.0409^{+0.0014}_{-0.0014}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.453^{+0.018}_{-0.018}$       | $D_{\mathrm{M}}(0.15)$      | $642^{+13}_{-13}$            |
| $\tau$                                   | $0.054^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.605^{+0.016}_{-0.016}$       | $H(0.38)$                   | $82.9^{+1.0}_{-1.0}$         |
| $Y_{\mathrm{P}}$                         | $0.246^{+0.035}_{-0.035}$       | $\sigma_8/h^{0.5}$                    | $0.985^{+0.023}_{-0.022}$       | $D_{\mathrm{M}}(0.38)$      | $1532^{+26}_{-26}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.042^{+0.030}_{-0.028}$       | $r_{\mathrm{drag}} h$                 | $99.4^{+2.4}_{-2.4}$            | $H(0.51)$                   | $89.64^{+0.88}_{-0.84}$      |
| $n_{\mathrm{s}}$                         | $0.967^{+0.017}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$           | $2.435^{+0.059}_{-0.060}$       | $D_{\mathrm{M}}(0.51)$      | $1984^{+31}_{-31}$           |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0049}_{-0.0048}$    | $z_{\mathrm{re}}$                     | $< 8.87$                        | $H(0.61)$                   | $95.27^{+0.77}_{-0.72}$      |
| $A_{100}^{\mathrm{PS}}$                  | $240^{+50}_{-50}$               | $10^9 A_{\mathrm{s}}$                 | $2.094^{+0.062}_{-0.057}$       | $D_{\mathrm{M}}(0.61)$      | $2309^{+34}_{-34}$           |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.879^{+0.026}_{-0.025}$       | $H(2.33)$                   | $236.2^{+1.7}_{-1.6}$        |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{40}$                              | $1225^{+33}_{-35}$              | $D_{\mathrm{M}}(2.33)$      | $5765^{+36}_{-38}$           |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+20}_{-10}$                | $D_{220}$                             | $5717^{+75}_{-77}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.45$                        | $D_{810}$                             | $2535^{+27}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.014}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                            | $815.5^{+9.8}_{-10}$            | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $D_{2000}$                            | $230.1^{+4.4}_{-4.5}$           | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.012}$    |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $n_{\mathrm{s},0.002}$                | $0.967^{+0.017}_{-0.016}$       | $f\sigma_8(0.51)$           | $0.474^{+0.012}_{-0.012}$    |
| $A^{\mathrm{kSZ}}$                       | —                               | $Y_{\mathrm{P}}$                      | $0.246^{+0.035}_{-0.035}$       | $\sigma_8(0.51)$            | $0.620^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.38}$          | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.248^{+0.035}_{-0.035}$       | $f\sigma_8(0.61)$           | $0.469^{+0.011}_{-0.010}$    |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.34}$          | Age/Gyr                               | $13.801^{+0.083}_{-0.086}$      | $\sigma_8(0.61)$            | $0.590^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $z_*$                                 | $1090.0^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | $0.2974^{+0.0060}_{-0.0053}$ |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.32}_{-0.31}$          | $r_*$                                 | $144.59^{+0.63}_{-0.64}$        | $\sigma_8(2.33)$            | $0.3065^{+0.0065}_{-0.0058}$ |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$                         | $1.04108^{+0.00069}_{-0.00068}$ | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0031}$    | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.889^{+0.060}_{-0.061}$      | $f_{2000}^{217}$            | $107.0^{+5.0}_{-5.1}$        |
| $c_{TE}$                                 | $0.997^{+0.011}_{-0.010}$       | $z_{\mathrm{drag}}$                   | $1059.8^{+1.9}_{-1.9}$          | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$               |
| $c_{EE}$                                 | $0.992^{+0.013}_{-0.013}$       | $r_{\mathrm{drag}}$                   | $147.28^{+0.65}_{-0.67}$        | $\chi_{\mathrm{simall}}^2$  | $396.8 (\nu: 1.5)$           |
| $H_0$                                    | $67.5^{+1.5}_{-1.5}$            | $k_{\mathrm{D}}$                      | $0.1406^{+0.0011}_{-0.0012}$    | $\chi_{\mathrm{lowl}}^2$    | $23.2 (\nu: 1.0)$            |
| $\Omega_{\Lambda}$                       | $0.687^{+0.019}_{-0.020}$       | $100\theta_{\mathrm{D}}$              | $0.1609^{+0.0014}_{-0.0013}$    | $\chi_{\mathrm{CamSpec}}^2$ | $11515.2 (\nu: 16.9)$        |
| $\Omega_{\mathrm{m}}$                    | $0.313^{+0.020}_{-0.019}$       | $z_{\mathrm{eq}}$                     | $3390^{+63}_{-62}$              | $\chi_{\mathrm{prior}}^2$   | $7.9 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1425^{+0.0026}_{-0.0026}$    | $k_{\mathrm{eq}}$                     | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{\mathrm{CMB}}^2$     | $11935.1 (\nu: 16.8)$        |
| $\Omega_{\mathrm{m}} h^3$                | $0.0961^{+0.0012}_{-0.0012}$    | $100\theta_{\mathrm{eq}}$             | $0.815^{+0.012}_{-0.012}$       |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11943.03; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.84; R - 1 = 0.01121$$



16.15 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02237^{+0.00036}_{-0.00036}$ | $S_8$                       | $0.820^{+0.025}_{-0.025}$       | $D_M(0.15)$                 | $639.6^{+8.9}_{-9.2}$        |
| $\Omega_c h^2$              | $0.1189^{+0.0020}_{-0.0021}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.449^{+0.014}_{-0.014}$       | $H(0.38)$                   | $83.13^{+0.77}_{-0.72}$      |
| $100\theta_{MC}$            | $1.0411^{+0.0013}_{-0.0012}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.014}_{-0.013}$       | $D_M(0.38)$                 | $1526^{+18}_{-19}$           |
| $\tau$                      | $0.055^{+0.013}_{-0.012}$       | $\sigma_8/h^{0.5}$          | $0.982^{+0.021}_{-0.019}$       | $H(0.51)$                   | $89.82^{+0.68}_{-0.62}$      |
| $Y_P$                       | $0.250^{+0.032}_{-0.032}$       | $r_{drag}h$                 | $99.9^{+1.7}_{-1.6}$            | $D_M(0.51)$                 | $1977^{+22}_{-23}$           |
| $\ln(10^{10} A_s)$          | $3.043^{+0.030}_{-0.028}$       | $\langle d^2 \rangle^{1/2}$ | $2.424^{+0.051}_{-0.049}$       | $H(0.61)$                   | $95.42^{+0.61}_{-0.56}$      |
| $n_s$                       | $0.969^{+0.015}_{-0.014}$       | $z_{re}$                    | $< 8.95$                        | $D_M(0.61)$                 | $2301^{+24}_{-25}$           |
| $y_{cal}$                   | $1.0005^{+0.0048}_{-0.0048}$    | $10^9 A_s$                  | $2.097^{+0.064}_{-0.059}$       | $H(2.33)$                   | $235.9^{+1.3}_{-1.3}$        |
| $A_{100}^{PS}$              | $242^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.026}_{-0.025}$       | $D_M(2.33)$                 | $5758^{+30}_{-31}$           |
| $A_{143}^{PS}$              | $40^{+20}_{-20}$                | $D_{40}$                    | $1220^{+31}_{-32}$              | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.013}$    |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{220}$                   | $5720^{+75}_{-75}$              | $\sigma_8(0.15)$            | $0.747^{+0.014}_{-0.013}$    |
| $A_{217}^{CIB}$             | $40^{+20}_{-10}$                | $D_{810}$                   | $2535^{+27}_{-26}$              | $f\sigma_8(0.38)$           | $0.473^{+0.011}_{-0.011}$    |
| $A_{143}^{tSZ}$             | $< 7.33$                        | $D_{1420}$                  | $815.5^{+9.7}_{-10}$            | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.26}$          | $D_{2000}$                  | $229.9^{+4.4}_{-4.4}$           | $f\sigma_8(0.51)$           | $0.472^{+0.011}_{-0.0099}$   |
| $r_{143 \times 217}^{CIB}$  | —                               | $n_{s,0.002}$               | $0.969^{+0.015}_{-0.014}$       | $\sigma_8(0.51)$            | $0.620^{+0.012}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $Y_P$                       | $0.250^{+0.032}_{-0.032}$       | $f\sigma_8(0.61)$           | $0.467^{+0.010}_{-0.0093}$   |
| $A^{kSZ}$                   | —                               | $Y_P^{BBN}$                 | $0.251^{+0.032}_{-0.032}$       | $\sigma_8(0.61)$            | $0.590^{+0.011}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.39}$          | Age/Gyr                     | $13.786^{+0.069}_{-0.071}$      | $f\sigma_8(2.33)$           | $0.2978^{+0.0057}_{-0.0054}$ |
| $A_{143}^{dust}$            | $0.97^{+0.35}_{-0.34}$          | $z_*$                       | $1090.0^{+1.2}_{-1.1}$          | $\sigma_8(2.33)$            | $0.3071^{+0.0061}_{-0.0058}$ |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.69^{+0.57}_{-0.58}$        | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.32}_{-0.31}$          | $100\theta_*$               | $1.04118^{+0.00062}_{-0.00063}$ | $f_{2000}^{217}$            | $107.3^{+4.9}_{-5.0}$        |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.897^{+0.056}_{-0.057}$      | $f_{2000}^{143 \times 217}$ | $33^{+5}_{-6}$               |
| $c_{217}$                   | $1.0012^{+0.0031}_{-0.0030}$    | $z_{drag}$                  | $1060.0^{+1.7}_{-1.7}$          | $\chi_{simall}^2$           | $396.9 (\nu: 1.7)$           |
| $c_{TE}$                    | $0.997^{+0.011}_{-0.010}$       | $r_{drag}$                  | $147.36^{+0.62}_{-0.63}$        | $\chi_{lowl}^2$             | $22.7 (\nu: 0.7)$            |
| $c_{EE}$                    | $0.994^{+0.013}_{-0.012}$       | $k_D$                       | $0.14039^{+0.00098}_{-0.00099}$ | $\chi_{CamSpec}^2$          | $11515.3 (\nu: 16.2)$        |
| $H_0$                       | $67.8^{+1.1}_{-1.0}$            | $100\theta_D$               | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6DF}^2$              | $0.043 (\nu: 0.0)$           |
| $\Omega_\Lambda$            | $0.691^{+0.013}_{-0.013}$       | $z_{eq}$                    | $3376^{+46}_{-48}$              | $\chi_{MGS}^2$              | $1.43 (\nu: 0.1)$            |
| $\Omega_m$                  | $0.309^{+0.013}_{-0.013}$       | $k_{eq}$                    | $0.01030^{+0.00014}_{-0.00015}$ | $\chi_{DR12BAO}^2$          | $4.5 (\nu: 0.8)$             |
| $\Omega_m h^2$              | $0.1419^{+0.0019}_{-0.0020}$    | $100\theta_{eq}$            | $0.8181^{+0.0090}_{-0.0084}$    | $\chi_{prior}^2$            | $7.9 (\nu: 5.9)$             |
| $\Omega_m h^3$              | $0.0962^{+0.0011}_{-0.0011}$    | $100\theta_{s,eq}$          | $0.4519^{+0.0046}_{-0.0043}$    | $\chi_{BAO}^2$              | $5.95 (\nu: 0.5)$            |
| $\sigma_8$                  | $0.808^{+0.016}_{-0.014}$       | $H(0.15)$                   | $73.06^{+0.96}_{-0.91}$         | $\chi_{CMB}^2$              | $11934.9 (\nu: 16.0)$        |

$$\bar{\chi}_{eff}^2 = 11948.72; \Delta\bar{\chi}_{eff}^2 = 0.73; R - 1 = 0.01724$$



16.16 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_lensing\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02229^{+0.00040}_{-0.00040}$ | $\sigma_8$                  | $0.810^{+0.014}_{-0.013}$       | $100\theta_{s,eq}$          | $0.4503^{+0.0053}_{-0.0052}$ |
| $\Omega_c h^2$              | $0.1196^{+0.0024}_{-0.0024}$    | $S_8$                       | $0.828^{+0.026}_{-0.025}$       | $H(0.15)$                   | $72.7^{+1.2}_{-1.2}$         |
| $100\theta_{MC}$            | $1.0408^{+0.0014}_{-0.0014}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.014}$       | $D_M(0.15)$                 | $643^{+12}_{-12}$            |
| $\tau$                      | $0.055^{+0.013}_{-0.012}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.013}_{-0.013}$       | $H(0.38)$                   | $82.86^{+0.95}_{-0.90}$      |
| $Y_P$                       | $0.244^{+0.034}_{-0.034}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.018}$       | $D_M(0.38)$                 | $1533^{+24}_{-24}$           |
| $\ln(10^{10} A_s)$          | $3.043^{+0.028}_{-0.026}$       | $r_{drag} h$                | $99.3^{+2.1}_{-2.1}$            | $H(0.51)$                   | $89.60^{+0.81}_{-0.77}$      |
| $n_s$                       | $0.965^{+0.017}_{-0.015}$       | $\langle d^2 \rangle^{1/2}$ | $2.440^{+0.047}_{-0.048}$       | $D_M(0.51)$                 | $1986^{+28}_{-29}$           |
| $y_{cal}$                   | $1.0005^{+0.0048}_{-0.0047}$    | $z_{re}$                    | $< 8.89$                        | $H(0.61)$                   | $95.23^{+0.71}_{-0.67}$      |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $10^9 A_s$                  | $2.096^{+0.059}_{-0.055}$       | $D_M(0.61)$                 | $2310^{+31}_{-32}$           |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.879^{+0.025}_{-0.024}$       | $H(2.33)$                   | $236.2^{+1.4}_{-1.4}$        |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1228^{+31}_{-32}$              | $D_M(2.33)$                 | $5767^{+35}_{-36}$           |
| $A_{217}^{CIB}$             | $40^{+20}_{-10}$                | $D_{220}$                   | $5721^{+75}_{-77}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{143}^{tSZ}$             | $< 7.43$                        | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.012}_{-0.012}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.26}$          | $D_{1420}$                  | $815.8^{+9.8}_{-9.7}$           | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.4^{+4.4}_{-4.4}$           | $\sigma_8(0.38)$            | $0.663^{+0.011}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.965^{+0.017}_{-0.015}$       | $f\sigma_8(0.51)$           | $0.4741^{+0.0091}_{-0.0091}$ |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.244^{+0.034}_{-0.034}$       | $\sigma_8(0.51)$            | $0.620^{+0.011}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.39}$          | $Y_P^{BBN}$                 | $0.246^{+0.034}_{-0.034}$       | $f\sigma_8(0.61)$           | $0.4689^{+0.0085}_{-0.0084}$ |
| $A_{143}^{dust}$            | $0.96^{+0.35}_{-0.34}$          | Age/Gyr                     | $13.806^{+0.080}_{-0.082}$      | $\sigma_8(0.61)$            | $0.590^{+0.011}_{-0.010}$    |
| $A_{217}^{dust}$            | $0.98^{+0.20}_{-0.20}$          | $z_*$                       | $1090.0^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | $0.2974^{+0.0060}_{-0.0052}$ |
| $A_{143 \times 217}^{dust}$ | $1.02^{+0.32}_{-0.31}$          | $r_*$                       | $144.59^{+0.58}_{-0.58}$        | $\sigma_8(2.33)$            | $0.3065^{+0.0066}_{-0.0057}$ |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0021}$    | $100\theta_*$               | $1.04105^{+0.00065}_{-0.00067}$ | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0030}$    | $D_M(z_*)/\text{Gpc}$       | $13.889^{+0.055}_{-0.056}$      | $f_{2000}^{217}$            | $106.8^{+5.0}_{-5.1}$        |
| $c_{TE}$                    | $0.996^{+0.011}_{-0.010}$       | $z_{drag}$                  | $1059.7^{+1.8}_{-1.8}$          | $f_{2000}^{143 \times 217}$ | $32^{+6}_{-6}$               |
| $c_{EE}$                    | $0.992^{+0.013}_{-0.013}$       | $r_{drag}$                  | $147.28^{+0.61}_{-0.63}$        | $\chi_{lensing}^2$          | $9.26 (\nu: 0.2)$            |
| $H_0$                       | $67.4^{+1.4}_{-1.3}$            | $k_D$                       | $0.1406^{+0.0011}_{-0.0011}$    | $\chi_{simall}^2$           | $396.9 (\nu: 1.4)$           |
| $\Omega_\Lambda$            | $0.686^{+0.016}_{-0.017}$       | $100\theta_D$               | $0.1608^{+0.0014}_{-0.0013}$    | $\chi_{lowl}^2$             | $23.4 (\nu: 0.9)$            |
| $\Omega_m$                  | $0.314^{+0.017}_{-0.016}$       | $z_{eq}$                    | $3392^{+54}_{-53}$              | $\chi_{CamSpec}^2$          | $11514.6 (\nu: 15.9)$        |
| $\Omega_m h^2$              | $0.1426^{+0.0022}_{-0.0022}$    | $k_{eq}$                    | $0.01035^{+0.00016}_{-0.00016}$ | $\chi_{prior}^2$            | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^3$              | $0.0961^{+0.0012}_{-0.0012}$    | $100\theta_{eq}$            | $0.815^{+0.011}_{-0.010}$       | $\chi_{CMB}^2$              | $11944.1 (\nu: 16.7)$        |

$$\bar{\chi}_{eff}^2 = 11951.89; \Delta\bar{\chi}_{eff}^2 = 0.64; R - 1 = 0.01571$$



16.17 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_BAO\_lensing\_zre6p5

| Parameter                                | 95% limits                      | Parameter                            | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|--------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}}h^2$                 | $0.02236^{+0.00035}_{-0.00036}$ | $\sigma_8\Omega_{\mathrm{m}}^{0.5}$  | $0.451^{+0.011}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$      | $1527^{+17}_{-19}$           |
| $\Omega_{\mathrm{c}}h^2$                 | $0.1191^{+0.0018}_{-0.0019}$    | $\sigma_8\Omega_{\mathrm{m}}^{0.25}$ | $0.604^{+0.012}_{-0.011}$       | $H(0.51)$                   | $89.77^{+0.65}_{-0.60}$      |
| $100\theta_{\mathrm{MC}}$                | $1.0411^{+0.0013}_{-0.0012}$    | $\sigma_8/h^{0.5}$                   | $0.984^{+0.017}_{-0.017}$       | $D_{\mathrm{M}}(0.51)$      | $1979^{+21}_{-22}$           |
| $\tau$                                   | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}}h$                 | $99.8^{+1.6}_{-1.5}$            | $H(0.61)$                   | $95.38^{+0.58}_{-0.55}$      |
| $Y_{\mathrm{P}}$                         | $0.248^{+0.032}_{-0.032}$       | $\langle d^2 \rangle^{1/2}$          | $2.431^{+0.042}_{-0.042}$       | $D_{\mathrm{M}}(0.61)$      | $2303^{+23}_{-25}$           |
| $\ln(10^{10}A_{\mathrm{s}})$             | $3.045^{+0.028}_{-0.027}$       | $z_{\mathrm{re}}$                    | $7.8^{+1.2}_{-1.3}$             | $H(2.33)$                   | $235.9^{+1.2}_{-1.2}$        |
| $n_{\mathrm{s}}$                         | $0.968^{+0.015}_{-0.013}$       | $10^9 A_{\mathrm{s}}$                | $2.102^{+0.060}_{-0.056}$       | $D_{\mathrm{M}}(2.33)$      | $5760^{+29}_{-30}$           |
| $y_{\mathrm{cal}}$                       | $1.0007^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}}e^{-2\tau}$      | $1.879^{+0.025}_{-0.024}$       | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $241^{+50}_{-50}$               | $D_{40}$                             | $1224^{+30}_{-30}$              | $\sigma_8(0.15)$            | $0.748^{+0.013}_{-0.012}$    |
| $A_{143}^{\mathrm{PS}}$                  | $40^{+20}_{-20}$                | $D_{220}$                            | $5725^{+74}_{-75}$              | $f\sigma_8(0.38)$           | $0.4740^{+0.0095}_{-0.0092}$ |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                            | $2536^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.663^{+0.012}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+20}_{-10}$                | $D_{1420}$                           | $815.9^{+9.7}_{-9.8}$           | $f\sigma_8(0.51)$           | $0.4728^{+0.0088}_{-0.0085}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.39$                        | $D_{2000}$                           | $230.2^{+4.3}_{-4.4}$           | $\sigma_8(0.51)$            | $0.621^{+0.012}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.25}_{-0.25}$          | $n_{\mathrm{s},0.002}$               | $0.968^{+0.015}_{-0.013}$       | $f\sigma_8(0.61)$           | $0.4680^{+0.0084}_{-0.0082}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                     | $0.248^{+0.032}_{-0.032}$       | $\sigma_8(0.61)$            | $0.591^{+0.011}_{-0.0097}$   |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$      | $0.250^{+0.032}_{-0.032}$       | $f\sigma_8(2.33)$           | $0.2980^{+0.0058}_{-0.0051}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                              | $13.790^{+0.068}_{-0.069}$      | $\sigma_8(2.33)$            | $0.3073^{+0.0059}_{-0.0057}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.01^{+0.38}_{-0.39}$          | $z_*$                                | $1090.0^{+1.1}_{-1.1}$          | $f_{2000}^{143}$            | $30^{+7}_{-7}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.35}_{-0.34}$          | $r_*$                                | $144.67^{+0.53}_{-0.54}$        | $f_{2000}^{217}$            | $107.1^{+4.9}_{-5.1}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.20}$          | $100\theta_*$                        | $1.04116^{+0.00061}_{-0.00062}$ | $f_{2000}^{143 \times 217}$ | $32^{+5}_{-6}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.02^{+0.31}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$   | $13.895^{+0.053}_{-0.054}$      | $\chi_{\mathrm{lensing}}^2$ | $9.28 (\nu: 0.3)$            |
| $c_{100}$                                | $0.9976^{+0.0020}_{-0.0020}$    | $z_{\mathrm{drag}}$                  | $1060.0^{+1.7}_{-1.7}$          | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.7)$           |
| $c_{217}$                                | $1.0012^{+0.0031}_{-0.0030}$    | $r_{\mathrm{drag}}$                  | $147.34^{+0.59}_{-0.60}$        | $\chi_{\mathrm{lowl}}^2$    | $22.9 (\nu: 0.7)$            |
| $c_{TE}$                                 | $0.997^{+0.011}_{-0.010}$       | $k_{\mathrm{D}}$                     | $0.14046^{+0.00095}_{-0.00098}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.8 (\nu: 15.7)$        |
| $c_{EE}$                                 | $0.993^{+0.013}_{-0.012}$       | $100\theta_{\mathrm{D}}$             | $0.1610^{+0.0013}_{-0.0013}$    | $\chi_{6\mathrm{DF}}^2$     | $0.046 (\nu: 0.0)$           |
| $H_0$                                    | $67.7^{+1.0}_{-0.97}$           | $z_{\mathrm{eq}}$                    | $3379^{+42}_{-42}$              | $\chi_{\mathrm{MGS}}^2$     | $1.35 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                    | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$            | $0.8175^{+0.0081}_{-0.0077}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 6.0)$             |
| $\Omega_{\mathrm{m}}h^2$                 | $0.1421^{+0.0018}_{-0.0017}$    | $100\theta_{\mathrm{s,eq}}$          | $0.4516^{+0.0041}_{-0.0040}$    | $\chi_{\mathrm{CMB}}^2$     | $11944.0 (\nu: 16.2)$        |
| $\Omega_{\mathrm{m}}h^3$                 | $0.0962^{+0.0011}_{-0.0011}$    | $H(0.15)$                            | $72.99^{+0.93}_{-0.86}$         | $\chi_{\mathrm{BAO}}^2$     | $6.00 (\nu: 0.5)$            |
| $\sigma_8$                               | $0.810^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$               | $640.3^{+8.4}_{-8.9}$           |                             |                              |
| $S_8$                                    | $0.823^{+0.021}_{-0.021}$       | $H(0.38)$                            | $83.07^{+0.75}_{-0.69}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11957.86; \Delta\bar{\chi}_{\mathrm{eff}}^2 = 0.60; R - 1 = 0.02091$$



16.18 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_post\_Riess18\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02256^{+0.00042}_{-0.00041}$ | $\sigma_8$                  | $0.808^{+0.016}_{-0.015}$       | $100\theta_{s,eq}$          | $0.4546^{+0.0057}_{-0.0059}$ |
| $\Omega_c h^2$              | $0.1177^{+0.0027}_{-0.0025}$    | $S_8$                       | $0.808^{+0.030}_{-0.030}$       | $H(0.15)$                   | $73.7^{+1.2}_{-1.2}$         |
| $100\theta_{MC}$            | $1.0417^{+0.0013}_{-0.0013}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.442^{+0.016}_{-0.016}$       | $D_M(0.15)$                 | $633^{+12}_{-11}$            |
| $\tau$                      | $0.057^{+0.014}_{-0.013}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.598^{+0.016}_{-0.016}$       | $H(0.38)$                   | $83.65^{+0.94}_{-0.96}$      |
| $Y_P$                       | $0.261^{+0.031}_{-0.033}$       | $\sigma_8/h^{0.5}$          | $0.975^{+0.022}_{-0.023}$       | $D_M(0.38)$                 | $1513^{+24}_{-23}$           |
| $\ln(10^{10} A_s)$          | $3.046^{+0.031}_{-0.029}$       | $r_{drag} h$                | $101.1^{+2.2}_{-2.2}$           | $H(0.51)$                   | $90.25^{+0.80}_{-0.81}$      |
| $n_s$                       | $0.976^{+0.015}_{-0.016}$       | $\langle d^2 \rangle^{1/2}$ | $2.400^{+0.060}_{-0.056}$       | $D_M(0.51)$                 | $1962^{+29}_{-27}$           |
| $y_{cal}$                   | $1.0006^{+0.0046}_{-0.0047}$    | $z_{re}$                    | $< 9.16$                        | $H(0.61)$                   | $95.79^{+0.73}_{-0.71}$      |
| $A_{100}^{PS}$              | $244^{+50}_{-50}$               | $10^9 A_s$                  | $2.104^{+0.066}_{-0.061}$       | $D_M(0.61)$                 | $2284^{+32}_{-30}$           |
| $A_{143}^{PS}$              | $42^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.025}_{-0.024}$       | $H(2.33)$                   | $235.3^{+1.6}_{-1.5}$        |
| $A_{217}^{PS}$              | $101^{+30}_{-30}$               | $D_{40}$                    | $1208^{+32}_{-31}$              | $D_M(2.33)$                 | $5741^{+35}_{-35}$           |
| $A_{217}^{CIB}$             | $41^{+10}_{-10}$                | $D_{220}$                   | $5727^{+67}_{-74}$              | $f\sigma_8(0.15)$           | $0.448^{+0.015}_{-0.016}$    |
| $A_{143}^{tSZ}$             | $< 7.24$                        | $D_{810}$                   | $2537^{+25}_{-26}$              | $\sigma_8(0.15)$            | $0.748^{+0.015}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | $0.65^{+0.24}_{-0.25}$          | $D_{1420}$                  | $815.4^{+9.5}_{-9.9}$           | $f\sigma_8(0.38)$           | $0.469^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $229.3^{+4.6}_{-4.3}$           | $\sigma_8(0.38)$            | $0.664^{+0.013}_{-0.012}$    |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.976^{+0.015}_{-0.016}$       | $f\sigma_8(0.51)$           | $0.469^{+0.011}_{-0.012}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.261^{+0.031}_{-0.033}$       | $\sigma_8(0.51)$            | $0.622^{+0.012}_{-0.011}$    |
| $A_{100}^{dust}$            | $1.01^{+0.39}_{-0.39}$          | $Y_P^{BBN}$                 | $0.262^{+0.032}_{-0.033}$       | $f\sigma_8(0.61)$           | $0.465^{+0.011}_{-0.010}$    |
| $A_{143}^{dust}$            | $0.97^{+0.32}_{-0.34}$          | Age/Gyr                     | $13.747^{+0.080}_{-0.077}$      | $\sigma_8(0.61)$            | $0.592^{+0.012}_{-0.010}$    |
| $A_{217}^{dust}$            | $0.97^{+0.19}_{-0.19}$          | $z_*$                       | $1090.1^{+1.1}_{-1.1}$          | $f\sigma_8(2.33)$           | $0.2990^{+0.0060}_{-0.0054}$ |
| $A_{143 \times 217}^{dust}$ | $1.04^{+0.32}_{-0.30}$          | $r_*$                       | $144.82^{+0.61}_{-0.62}$        | $\sigma_8(2.33)$            | $0.3088^{+0.0064}_{-0.0059}$ |
| $c_{100}$                   | $0.9975^{+0.0020}_{-0.0020}$    | $100\theta_*$               | $1.04140^{+0.00065}_{-0.00066}$ | $f_{2000}^{143}$            | $31^{+7}_{-7}$               |
| $c_{217}$                   | $1.0013^{+0.0030}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.907^{+0.056}_{-0.059}$      | $f_{2000}^{217}$            | $108.1^{+5.0}_{-5.1}$        |
| $c_{TE}$                    | $0.999^{+0.011}_{-0.011}$       | $z_{drag}$                  | $1060.7^{+1.8}_{-1.8}$          | $f_{2000}^{143 \times 217}$ | $34^{+5}_{-5}$               |
| $c_{EE}$                    | $0.996^{+0.012}_{-0.013}$       | $r_{drag}$                  | $147.44^{+0.65}_{-0.64}$        | $\chi_{simall}^2$           | $397.1 (\nu: 2.1)$           |
| $H_0$                       | $68.6^{+1.3}_{-1.4}$            | $k_D$                       | $0.1400^{+0.0011}_{-0.0010}$    | $\chi_{lowl}^2$             | $21.8 (\nu: 0.6)$            |
| $\Omega_\Lambda$            | $0.700^{+0.016}_{-0.017}$       | $100\theta_D$               | $0.1614^{+0.0012}_{-0.0014}$    | $\chi_{CamSpec}^2$          | $11518.1 (\nu: 20.3)$        |
| $\Omega_m$                  | $0.300^{+0.017}_{-0.016}$       | $z_{eq}$                    | $3352^{+60}_{-57}$              | $\chi_{H073p45}^2$          | $8.9 (\nu: 3.3)$             |
| $\Omega_m h^2$              | $0.1409^{+0.0025}_{-0.0024}$    | $k_{eq}$                    | $0.01023^{+0.00018}_{-0.00017}$ | $\chi_{prior}^2$            | $7.9 (\nu: 6.2)$             |
| $\Omega_m h^3$              | $0.0966^{+0.0012}_{-0.0011}$    | $100\theta_{eq}$            | $0.823^{+0.011}_{-0.012}$       | $\chi_{CMB}^2$              | $11937.0 (\nu: 18.7)$        |

$$\bar{\chi}_{eff}^2 = 11953.75; \Delta\bar{\chi}_{eff}^2 = -0.26; R - 1 = 0.05858$$



# 16.19 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15

| Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                      | Parameter                   | Best fit | 95% limits                   |
|-----------------------------|----------|---------------------------------|-----------------------------|----------|---------------------------------|-----------------------------|----------|------------------------------|
| $\Omega_b h^2$              | 0.022378 | $0.02228^{+0.00032}_{-0.00032}$ | $\sigma_8$                  | 0.8229   | $0.808^{+0.015}_{-0.015}$       | $100\theta_{s,eq}$          | 0.4516   | $0.4503^{+0.0061}_{-0.0060}$ |
| $\Omega_c h^2$              | 0.11902  | $0.1196^{+0.0027}_{-0.0027}$    | $S_8$                       | 0.8360   | $0.826^{+0.032}_{-0.032}$       | $H(0.15)$                   | 72.99    | $72.7^{+1.1}_{-1.0}$         |
| $100\theta_{MC}$            | 1.04099  | $1.04081^{+0.00068}_{-0.00068}$ | $\sigma_8 \Omega_m^{0.5}$   | 0.4579   | $0.453^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | 640.2    | $643^{+11}_{-11}$            |
| $\tau$                      | 0.0706   | $0.053^{+0.016}_{-0.016}$       | $\sigma_8 \Omega_m^{0.25}$  | 0.6138   | $0.605^{+0.016}_{-0.016}$       | $H(0.38)$                   | 83.07    | $82.84^{+0.79}_{-0.75}$      |
| $Y_P$                       | 0.2447   | $0.2438^{+0.0075}_{-0.0075}$    | $\sigma_8/h^{0.5}$          | 0.9999   | $0.984^{+0.023}_{-0.023}$       | $D_M(0.38)$                 | 1527.4   | $1534^{+21}_{-21}$           |
| $\ln(10^{10} A_s)$          | 3.0785   | $3.038^{+0.032}_{-0.033}$       | $r_{drag} h$                | 99.79    | $99.2^{+2.2}_{-2.1}$            | $H(0.51)$                   | 89.77    | $89.58^{+0.63}_{-0.60}$      |
| $n_s$                       | 0.9681   | $0.9651^{+0.0095}_{-0.0095}$    | $\langle d^2 \rangle^{1/2}$ | 2.471    | $2.434^{+0.056}_{-0.056}$       | $D_M(0.51)$                 | 1978.9   | $1986^{+25}_{-25}$           |
| $y_{cal}$                   | 1.00295  | $1.0004^{+0.0049}_{-0.0049}$    | $z_{re}$                    | 9.24     | $7.5^{+1.5}_{-1.7}$             | $H(0.61)$                   | 95.38    | $95.21^{+0.51}_{-0.49}$      |
| $A_{100}^{PS}$              | 234.5    | $240^{+50}_{-50}$               | $10^9 A_s$                  | 2.173    | $2.086^{+0.069}_{-0.067}$       | $D_M(0.61)$                 | 2302.9   | $2311^{+26}_{-27}$           |
| $A_{143}^{PS}$              | 42.8     | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | 1.8866   | $1.877^{+0.023}_{-0.023}$       | $H(2.33)$                   | 235.93   | $236.2^{+1.6}_{-1.6}$        |
| $A_{217}^{PS}$              | 105.0    | $102^{+30}_{-30}$               | $D_{40}$                    | 1234.2   | $1227^{+27}_{-26}$              | $D_M(2.33)$                 | 5760.1   | $5768^{+23}_{-24}$           |
| $A_{217}^{CIB}$             | 40.7     | $40^{+10}_{-10}$                | $D_{220}$                   | 5753     | $5717^{+77}_{-78}$              | $f\sigma_8(0.15)$           | 0.4627   | $0.457^{+0.016}_{-0.016}$    |
| $A_{143}^{tSZ}$             | 5.24     | $< 7.58$                        | $D_{810}$                   | 2548.6   | $2534^{+26}_{-26}$              | $\sigma_8(0.15)$            | 0.7605   | $0.746^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{PS}$   | 0.674    | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | 821.0    | $815.5^{+9.3}_{-9.4}$           | $f\sigma_8(0.38)$           | 0.4818   | $0.475^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | 0.73     | —                               | $D_{2000}$                  | 232.37   | $230.3^{+3.2}_{-3.3}$           | $\sigma_8(0.38)$            | 0.6744   | $0.661^{+0.011}_{-0.011}$    |
| $\xi^{tSZ \times CIB}$      | 0.54     | —                               | $n_{s,0.002}$               | 0.9681   | $0.9651^{+0.0095}_{-0.0095}$    | $f\sigma_8(0.51)$           | 0.4806   | $0.473^{+0.012}_{-0.012}$    |
| $A^{kSZ}$                   | 1.7      | —                               | $Y_P$                       | 0.2447   | $0.2438^{+0.0075}_{-0.0075}$    | $\sigma_8(0.51)$            | 0.6312   | $0.618^{+0.010}_{-0.010}$    |
| $A_{100}^{dust}$            | 1.009    | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | 0.2460   | $0.2451^{+0.0075}_{-0.0075}$    | $f\sigma_8(0.61)$           | 0.4756   | $0.468^{+0.011}_{-0.011}$    |
| $A_{143}^{dust}$            | 0.953    | $0.96^{+0.34}_{-0.35}$          | Age/Gyr                     | 13.791   | $13.808^{+0.052}_{-0.053}$      | $\sigma_8(0.61)$            | 0.6006   | $0.5884^{+0.0099}_{-0.0099}$ |
| $A_{217}^{dust}$            | 0.981    | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | 1089.80  | $1089.94^{+0.61}_{-0.58}$       | $f\sigma_8(2.33)$           | 0.3029   | $0.2966^{+0.0050}_{-0.0049}$ |
| $A_{143 \times 217}^{dust}$ | 0.997    | $1.03^{+0.33}_{-0.31}$          | $r_*$                       | 144.68   | $144.61^{+0.63}_{-0.62}$        | $\sigma_8(2.33)$            | 0.3124   | $0.3056^{+0.0053}_{-0.0052}$ |
| $c_{100}$                   | 0.99773  | $0.9975^{+0.0021}_{-0.0021}$    | $100\theta_*$               | 1.04119  | $1.04105^{+0.00061}_{-0.00061}$ | $f_{2000}^{143}$            | 28.8     | $30^{+6}_{-6}$               |
| $c_{217}$                   | 1.00116  | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | 13.896   | $13.890^{+0.058}_{-0.058}$      | $f_{2000}^{217}$            | 106.37   | $106.8^{+3.8}_{-3.8}$        |
| $c_{TE}$                    | 0.9951   | $0.9965^{+0.0096}_{-0.0097}$    | $z_{drag}$                  | 1059.86  | $1059.64^{+0.75}_{-0.78}$       | $f_{2000}^{143 \times 217}$ | 31.21    | $32^{+4}_{-4}$               |
| $c_{EE}$                    | 0.9916   | $0.992^{+0.010}_{-0.0097}$      | $r_{drag}$                  | 147.34   | $147.30^{+0.62}_{-0.63}$        | $\chi_{small}^2$            | 402.51   | $396.9 (\nu: 1.4)$           |
| $H_0$                       | 67.73    | $67.4^{+1.2}_{-1.2}$            | $k_D$                       | 0.14064  | $0.14064^{+0.00071}_{-0.00072}$ | $\chi_{lowl}^2$             | 23.31    | $23.3 (\nu: 0.5)$            |
| $\Omega_\Lambda$            | 0.6903   | $0.686^{+0.017}_{-0.017}$       | $100\theta_D$               | 0.160759 | $0.16082^{+0.00048}_{-0.00046}$ | $\chi_{CamSpec}^2$          | 11498.1  | $11514.6 (\nu: 15.7)$        |
| $\Omega_m$                  | 0.3097   | $0.314^{+0.017}_{-0.017}$       | $z_{eq}$                    | 3379     | $3391^{+62}_{-62}$              | $\chi_{Aver15}^2$           | 0.08     | $0.9 (\nu: 0.8)$             |
| $\Omega_m h^2$              | 0.14204  | $0.1425^{+0.0026}_{-0.0026}$    | $k_{eq}$                    | 0.010313 | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{prior}^2$            | 3.4      | $7.8 (\nu: 5.7)$             |
| $\Omega_m h^3$              | 0.09620  | $0.09604^{+0.00067}_{-0.00065}$ | $100\theta_{eq}$            | 0.8175   | $0.815^{+0.012}_{-0.012}$       | $\chi_{CMB}^2$              | 11923.9  | $11934.8 (\nu: 16.1)$        |

Best-fit  $\chi_{eff}^2 = 11927.35$ ;  $\bar{\chi}_{eff}^2 = 11943.52$ ;  $R - 1 = 0.01118$

$\chi_{eff}^2$ : Abund - Yp\_Aver2015: 0.08 CMB - simall\_100x143\_offlike5\_EE\_Aplanck\_B: 402.51 commander\_dx12\_v3.2\_29: 23.31 CamSpec like\_10.7HM\_1400\_unified: 11498.08



## 16.20 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02232^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.448^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+16}_{-16}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1189^{+0.0020}_{-0.0020}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.601^{+0.014}_{-0.013}$       | $H(0.51)$                   | $89.73^{+0.48}_{-0.46}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00063}_{-0.00064}$ | $\sigma_8/h^{0.5}$                    | $0.979^{+0.021}_{-0.020}$       | $D_{\mathrm{M}}(0.51)$      | $1980^{+18}_{-18}$           |
| $\tau$                                   | $0.053^{+0.016}_{-0.015}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.6}_{-1.5}$            | $H(0.61)$                   | $95.33^{+0.41}_{-0.39}$      |
| $Y_{\mathrm{P}}$                         | $0.2439^{+0.0073}_{-0.0075}$    | $\langle d^2 \rangle^{1/2}$           | $2.424^{+0.051}_{-0.047}$       | $D_{\mathrm{M}}(0.61)$      | $2304^{+20}_{-20}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.038^{+0.033}_{-0.032}$       | $z_{\mathrm{re}}$                     | $7.6^{+1.6}_{-1.6}$             | $H(2.33)$                   | $235.8^{+1.2}_{-1.2}$        |
| $n_{\mathrm{s}}$                         | $0.9668^{+0.0081}_{-0.0082}$    | $10^9 A_{\mathrm{s}}$                 | $2.087^{+0.069}_{-0.065}$       | $D_{\mathrm{M}}(2.33)$      | $5763^{+18}_{-19}$           |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.875^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$           | $0.453^{+0.013}_{-0.013}$    |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{40}$                              | $1224^{+24}_{-25}$              | $\sigma_8(0.15)$            | $0.745^{+0.013}_{-0.013}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5721^{+77}_{-78}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.660^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $816.0^{+9.1}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.471^{+0.010}_{-0.0098}$   |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.53$                        | $D_{2000}$                            | $230.4^{+3.1}_{-3.2}$           | $\sigma_8(0.51)$            | $0.618^{+0.010}_{-0.010}$    |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9668^{+0.0081}_{-0.0082}$    | $f\sigma_8(0.61)$           | $0.4657^{+0.0096}_{-0.0092}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2439^{+0.0073}_{-0.0075}$    | $\sigma_8(0.61)$            | $0.588^{+0.010}_{-0.0096}$   |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2453^{+0.0074}_{-0.0075}$    | $f\sigma_8(2.33)$           | $0.2966^{+0.0051}_{-0.0048}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.798^{+0.042}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3059^{+0.0053}_{-0.0050}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.38}_{-0.39}$          | $z_*$                                 | $1089.83^{+0.51}_{-0.50}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.35}$          | $r_*$                                 | $144.75^{+0.50}_{-0.49}$        | $f_{2000}^{217}$            | $106.6^{+3.9}_{-3.9}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$                         | $1.04113^{+0.00057}_{-0.00058}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.33}_{-0.30}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.903^{+0.047}_{-0.047}$      | $\chi_{\mathrm{simall}}^2$  | $397.0 (\nu: 1.5)$           |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.70^{+0.73}_{-0.72}$       | $\chi_{\mathrm{lowl}}^2$    | $22.93 (\nu: 0.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.44^{+0.52}_{-0.52}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.7 (\nu: 15.9)$        |
| $c_{TE}$                                 | $0.9966^{+0.0096}_{-0.0099}$    | $k_{\mathrm{D}}$                      | $0.14053^{+0.00064}_{-0.00067}$ | $\chi_{\mathrm{Aver15}}^2$  | $0.9 (\nu: 0.8)$             |
| $c_{EE}$                                 | $0.9922^{+0.010}_{-0.0099}$     | $100\theta_{\mathrm{D}}$              | $0.16080^{+0.00047}_{-0.00045}$ | $\chi_{6\mathrm{DF}}^2$     | $0.046 (\nu: 0.0)$           |
| $H_0$                                    | $67.69^{+0.91}_{-0.89}$         | $z_{\mathrm{eq}}$                     | $3375^{+46}_{-45}$              | $\chi_{\mathrm{MGS}}^2$     | $1.36 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.8180^{+0.0088}_{-0.0085}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1419^{+0.0019}_{-0.0019}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4519^{+0.0045}_{-0.0044}$    | $\chi_{\mathrm{BAO}}^2$     | $6.0 (\nu: 0.5)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.09604^{+0.00068}_{-0.00064}$ | $H(0.15)$                             | $72.95^{+0.79}_{-0.77}$         | $\chi_{\mathrm{CMB}}^2$     | $11934.6 (\nu: 15.8)$        |
| $\sigma_8$                               | $0.806^{+0.015}_{-0.014}$       | $D_{\mathrm{M}}(0.15)$                | $640.6^{+7.7}_{-7.8}$           |                             |                              |
| $S_8$                                    | $0.819^{+0.026}_{-0.024}$       | $H(0.38)$                             | $83.03^{+0.60}_{-0.57}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.33; R - 1 = 0.01547$$



## 16.21 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02228^{+0.00032}_{-0.00031}$ | $S_8$                       | $0.828^{+0.025}_{-0.026}$       | $D_M(0.15)$                 | $643.6^{+9.4}_{-9.5}$        |
| $\Omega_c h^2$                       | $0.1197^{+0.0024}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.014}$       | $H(0.38)$                   | $82.81^{+0.71}_{-0.67}$      |
| $100\theta_{MC}$                     | $1.04080^{+0.00067}_{-0.00067}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.013}_{-0.013}$       | $D_M(0.38)$                 | $1534^{+19}_{-19}$           |
| $\tau$                               | $0.053^{+0.015}_{-0.015}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.018}$       | $H(0.51)$                   | $89.56^{+0.58}_{-0.55}$      |
| $Y_P$                                | $0.2437^{+0.0074}_{-0.0074}$    | $r_{\text{drag}} h$         | $99.2^{+1.9}_{-1.8}$            | $D_M(0.51)$                 | $1987^{+22}_{-23}$           |
| $\ln(10^{10} A_s)$                   | $3.040^{+0.029}_{-0.029}$       | $\langle d^2 \rangle^{1/2}$ | $2.439^{+0.043}_{-0.044}$       | $H(0.61)$                   | $95.20^{+0.48}_{-0.45}$      |
| $n_s$                                | $0.9646^{+0.0088}_{-0.0091}$    | $z_{\text{re}}$             | $7.6^{+1.4}_{-1.6}$             | $D_M(0.61)$                 | $2312^{+23}_{-24}$           |
| $y_{\text{cal}}$                     | $1.0005^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | $2.091^{+0.061}_{-0.060}$       | $H(2.33)$                   | $236.3^{+1.5}_{-1.5}$        |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.022}_{-0.021}$       | $D_M(2.33)$                 | $5769^{+22}_{-23}$           |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1229^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                   | $5720^{+78}_{-78}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                   | $2535^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                  | $815.6^{+9.4}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6618^{+0.0095}_{-0.0095}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $D_{2000}$                  | $230.3^{+3.2}_{-3.3}$           | $f\sigma_8(0.51)$           | $0.4737^{+0.0091}_{-0.0092}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9646^{+0.0088}_{-0.0091}$    | $\sigma_8(0.51)$            | $0.6192^{+0.0089}_{-0.0089}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2437^{+0.0074}_{-0.0074}$    | $f\sigma_8(0.61)$           | $0.4685^{+0.0083}_{-0.0085}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2450^{+0.0074}_{-0.0075}$    | $\sigma_8(0.61)$            | $0.5891^{+0.0086}_{-0.0086}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | Age/Gyr                     | $13.809^{+0.049}_{-0.050}$      | $f\sigma_8(2.33)$           | $0.2969^{+0.0046}_{-0.0045}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_*$                       | $1089.95^{+0.57}_{-0.54}$       | $\sigma_8(2.33)$            | $0.3059^{+0.0049}_{-0.0049}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.58^{+0.55}_{-0.55}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.30}$          | $100\theta_*$               | $1.04103^{+0.00061}_{-0.00060}$ | $f_{2000}^{217}$            | $106.8^{+3.8}_{-3.9}$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $D_M(z_*)/\text{Gpc}$       | $13.888^{+0.051}_{-0.052}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.64^{+0.75}_{-0.78}$       | $\chi_{\text{lensing}}^2$   | $9.28 (\nu: 0.2)$            |
| $c_{TE}$                             | $0.9964^{+0.0097}_{-0.0098}$    | $r_{\text{drag}}$           | $147.27^{+0.56}_{-0.56}$        | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.3)$           |
| $c_{EE}$                             | $0.9918^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.14067^{+0.00066}_{-0.00068}$ | $\chi_{\text{lowl}}^2$      | $23.40 (\nu: 0.4)$           |
| $H_0$                                | $67.3^{+1.1}_{-1.1}$            | $100\theta_D$               | $0.16081^{+0.00047}_{-0.00045}$ | $\chi_{\text{CamSpec}}^2$   | $11514.0 (\nu: 14.8)$        |
| $\Omega_\Lambda$                     | $0.685^{+0.015}_{-0.015}$       | $z_{\text{eq}}$             | $3393^{+55}_{-55}$              | $\chi_{\text{Aver15}}^2$    | $0.9 (\nu: 0.8)$             |
| $\Omega_m$                           | $0.315^{+0.015}_{-0.015}$       | $k_{\text{eq}}$             | $0.01036^{+0.00017}_{-0.00017}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.7)$             |
| $\Omega_m h^2$                       | $0.1426^{+0.0023}_{-0.0023}$    | $100\theta_{\text{eq}}$     | $0.815^{+0.010}_{-0.010}$       | $\chi_{\text{CMB}}^2$       | $11943.6 (\nu: 16.1)$        |
| $\Omega_m h^3$                       | $0.09605^{+0.00067}_{-0.00064}$ | $100\theta_{s,\text{eq}}$   | $0.4501^{+0.0054}_{-0.0052}$    |                             |                              |
| $\sigma_8$                           | $0.809^{+0.012}_{-0.012}$       | $H(0.15)$                   | $72.65^{+0.96}_{-0.92}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11952.40; R - 1 = 0.01479$$



## 16.22 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_lensing

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02232^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.450^{+0.012}_{-0.011}$       | $D_M(0.38)$                 | $1529^{+15}_{-15}$           |
| $\Omega_c h^2$                       | $0.1191^{+0.0019}_{-0.0019}$    | $\sigma_8 \Omega_m^{0.25}$  | $0.603^{+0.011}_{-0.011}$       | $H(0.51)$                   | $89.70^{+0.46}_{-0.44}$      |
| $100\theta_{MC}$                     | $1.04089^{+0.00064}_{-0.00064}$ | $\sigma_8/h^{0.5}$          | $0.982^{+0.017}_{-0.016}$       | $D_M(0.51)$                 | $1981^{+17}_{-18}$           |
| $\tau$                               | $0.055^{+0.015}_{-0.014}$       | $r_{\text{drag}} h$         | $99.7^{+1.5}_{-1.4}$            | $H(0.61)$                   | $95.31^{+0.40}_{-0.38}$      |
| $Y_P$                                | $0.2439^{+0.0073}_{-0.0075}$    | $\langle d^2 \rangle^{1/2}$ | $2.432^{+0.041}_{-0.040}$       | $D_M(0.61)$                 | $2305^{+19}_{-19}$           |
| $\ln(10^{10} A_s)$                   | $3.042^{+0.029}_{-0.028}$       | $z_{\text{re}}$             | $7.7^{+1.4}_{-1.5}$             | $H(2.33)$                   | $235.9^{+1.2}_{-1.2}$        |
| $n_s$                                | $0.9663^{+0.0081}_{-0.0081}$    | $10^9 A_s$                  | $2.096^{+0.061}_{-0.059}$       | $D_M(2.33)$                 | $5764^{+18}_{-19}$           |
| $y_{\text{cal}}$                     | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_s e^{-2\tau}$       | $1.876^{+0.021}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{100}^{\text{PS}}$                | $239^{+50}_{-50}$               | $D_{40}$                    | $1226^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.011}$    |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{220}$                   | $5725^{+77}_{-77}$              | $f\sigma_8(0.38)$           | $0.4733^{+0.0091}_{-0.0092}$ |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{810}$                   | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.6619^{+0.0096}_{-0.0094}$ |
| $A_{217}^{\text{CIB}}$               | $39^{+10}_{-10}$                | $D_{1420}$                  | $816.2^{+9.1}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.4720^{+0.0083}_{-0.0083}$ |
| $A_{143}^{\text{tSZ}}$               | $< 7.51$                        | $D_{2000}$                  | $230.5^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | $0.6195^{+0.0090}_{-0.0088}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $n_{s,0.002}$               | $0.9663^{+0.0081}_{-0.0081}$    | $f\sigma_8(0.61)$           | $0.4672^{+0.0077}_{-0.0077}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $Y_P$                       | $0.2439^{+0.0073}_{-0.0075}$    | $\sigma_8(0.61)$            | $0.5895^{+0.0087}_{-0.0084}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P^{\text{BBN}}$          | $0.2452^{+0.0074}_{-0.0075}$    | $f\sigma_8(2.33)$           | $0.2973^{+0.0046}_{-0.0043}$ |
| $A^{\text{kSZ}}$                     | —                               | Age/Gyr                     | $13.799^{+0.042}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3065^{+0.0048}_{-0.0046}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | $z_*$                       | $1089.84^{+0.50}_{-0.48}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $r_*$                       | $144.71^{+0.46}_{-0.45}$        | $f_{2000}^{217}$            | $106.6^{+3.8}_{-3.9}$        |
| $A_{217}^{\text{dust}}$              | $0.98^{+0.20}_{-0.21}$          | $100\theta_*$               | $1.04112^{+0.00058}_{-0.00057}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.30}$          | $D_M(z_*)/\text{Gpc}$       | $13.900^{+0.043}_{-0.044}$      | $\chi_{\text{lensing}}^2$   | $9.29 (\nu: 0.3)$            |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\text{drag}}$           | $1059.71^{+0.76}_{-0.73}$       | $\chi_{\text{simall}}^2$    | $397.1 (\nu: 1.6)$           |
| $c_{217}$                            | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\text{drag}}$           | $147.40^{+0.48}_{-0.49}$        | $\chi_{\text{lowl}}^2$      | $23.11 (\nu: 0.3)$           |
| $c_{TE}$                             | $0.9965^{+0.0097}_{-0.0098}$    | $k_D$                       | $0.14057^{+0.00062}_{-0.00064}$ | $\chi_{\text{CamSpec}}^2$   | $11514.1 (\nu: 15.0)$        |
| $c_{EE}$                             | $0.9921^{+0.0099}_{-0.0099}$    | $100\theta_D$               | $0.16079^{+0.00047}_{-0.00044}$ | $\chi_{\text{Aver15}}^2$    | $0.9 (\nu: 0.8)$             |
| $H_0$                                | $67.63^{+0.87}_{-0.85}$         | $z_{\text{eq}}$             | $3379^{+43}_{-43}$              | $\chi_{6\text{DF}}^2$       | $0.050 (\nu: 0.0)$           |
| $\Omega_\Lambda$                     | $0.689^{+0.011}_{-0.011}$       | $k_{\text{eq}}$             | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\text{MGS}}^2$       | $1.29 (\nu: 0.1)$            |
| $\Omega_m$                           | $0.311^{+0.011}_{-0.011}$       | $100\theta_{\text{eq}}$     | $0.8174^{+0.0081}_{-0.0079}$    | $\chi_{\text{DR12BAO}}^2$   | $4.7 (\nu: 0.8)$             |
| $\Omega_m h^2$                       | $0.1420^{+0.0018}_{-0.0018}$    | $100\theta_{s,\text{eq}}$   | $0.4515^{+0.0042}_{-0.0041}$    | $\chi_{\text{prior}}^2$     | $7.8 (\nu: 5.8)$             |
| $\Omega_m h^3$                       | $0.09606^{+0.00067}_{-0.00064}$ | $H(0.15)$                   | $72.90^{+0.76}_{-0.73}$         | $\chi_{\text{CMB}}^2$       | $11943.5 (\nu: 15.9)$        |
| $\sigma_8$                           | $0.808^{+0.012}_{-0.012}$       | $D_M(0.15)$                 | $641.1^{+7.3}_{-7.4}$           | $\chi_{\text{BAO}}^2$       | $6.1 (\nu: 0.5)$             |
| $S_8$                                | $0.822^{+0.021}_{-0.021}$       | $H(0.38)$                   | $83.00^{+0.57}_{-0.54}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11958.34; R - 1 = 0.01579$$



### 16.23 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_zre6p5

| Parameter                   | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|-----------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$              | $0.02228^{+0.00032}_{-0.00032}$ | $\sigma_8$                  | $0.809^{+0.014}_{-0.013}$       | $100\theta_{s,eq}$          | $0.4505^{+0.0061}_{-0.0059}$ |
| $\Omega_c h^2$              | $0.1196^{+0.0027}_{-0.0027}$    | $S_8$                       | $0.827^{+0.031}_{-0.032}$       | $H(0.15)$                   | $72.7^{+1.1}_{-1.0}$         |
| $100\theta_{MC}$            | $1.04082^{+0.00069}_{-0.00068}$ | $\sigma_8 \Omega_m^{0.5}$   | $0.453^{+0.017}_{-0.017}$       | $D_M(0.15)$                 | $643^{+10}_{-11}$            |
| $\tau$                      | $0.054^{+0.013}_{-0.011}$       | $\sigma_8 \Omega_m^{0.25}$  | $0.605^{+0.016}_{-0.016}$       | $H(0.38)$                   | $82.85^{+0.79}_{-0.74}$      |
| $Y_P$                       | $0.2438^{+0.0075}_{-0.0075}$    | $\sigma_8/h^{0.5}$          | $0.985^{+0.023}_{-0.022}$       | $D_M(0.38)$                 | $1533^{+21}_{-21}$           |
| $\ln(10^{10} A_s)$          | $3.041^{+0.028}_{-0.026}$       | $r_{drag} h$                | $99.3^{+2.2}_{-2.1}$            | $H(0.51)$                   | $89.59^{+0.63}_{-0.59}$      |
| $n_s$                       | $0.9653^{+0.0094}_{-0.0094}$    | $\langle d^2 \rangle^{1/2}$ | $2.437^{+0.055}_{-0.055}$       | $D_M(0.51)$                 | $1986^{+24}_{-25}$           |
| $y_{cal}$                   | $1.0004^{+0.0049}_{-0.0048}$    | $z_{re}$                    | $< 8.84$                        | $H(0.61)$                   | $95.23^{+0.52}_{-0.48}$      |
| $A_{100}^{PS}$              | $240^{+50}_{-50}$               | $10^9 A_s$                  | $2.092^{+0.058}_{-0.054}$       | $D_M(0.61)$                 | $2310^{+26}_{-27}$           |
| $A_{143}^{PS}$              | $39^{+20}_{-20}$                | $10^9 A_s e^{-2\tau}$       | $1.877^{+0.023}_{-0.023}$       | $H(2.33)$                   | $236.2^{+1.6}_{-1.6}$        |
| $A_{217}^{PS}$              | $102^{+30}_{-30}$               | $D_{40}$                    | $1227^{+27}_{-26}$              | $D_M(2.33)$                 | $5768^{+23}_{-23}$           |
| $A_{217}^{CIB}$             | $40^{+10}_{-10}$                | $D_{220}$                   | $5717^{+78}_{-78}$              | $f\sigma_8(0.15)$           | $0.457^{+0.016}_{-0.016}$    |
| $A_{143}^{tSZ}$             | $< 7.58$                        | $D_{810}$                   | $2534^{+26}_{-26}$              | $\sigma_8(0.15)$            | $0.747^{+0.012}_{-0.011}$    |
| $r_{143 \times 217}^{PS}$   | $0.66^{+0.25}_{-0.25}$          | $D_{1420}$                  | $815.5^{+9.3}_{-9.4}$           | $f\sigma_8(0.38)$           | $0.475^{+0.013}_{-0.013}$    |
| $r_{143 \times 217}^{CIB}$  | —                               | $D_{2000}$                  | $230.3^{+3.2}_{-3.2}$           | $\sigma_8(0.38)$            | $0.662^{+0.010}_{-0.0096}$   |
| $\xi^{tSZ \times CIB}$      | —                               | $n_{s,0.002}$               | $0.9653^{+0.0094}_{-0.0094}$    | $f\sigma_8(0.51)$           | $0.473^{+0.011}_{-0.012}$    |
| $A^{kSZ}$                   | —                               | $Y_P$                       | $0.2438^{+0.0075}_{-0.0075}$    | $\sigma_8(0.51)$            | $0.6194^{+0.0092}_{-0.0088}$ |
| $A_{100}^{dust}$            | $1.01^{+0.38}_{-0.38}$          | $Y_P^{BBN}$                 | $0.2451^{+0.0076}_{-0.0075}$    | $f\sigma_8(0.61)$           | $0.468^{+0.010}_{-0.010}$    |
| $A_{143}^{dust}$            | $0.96^{+0.34}_{-0.35}$          | Age/Gyr                     | $13.807^{+0.051}_{-0.052}$      | $\sigma_8(0.61)$            | $0.5893^{+0.0087}_{-0.0082}$ |
| $A_{217}^{dust}$            | $0.97^{+0.20}_{-0.20}$          | $z_*$                       | $1089.93^{+0.60}_{-0.58}$       | $f\sigma_8(2.33)$           | $0.2970^{+0.0043}_{-0.0040}$ |
| $A_{143 \times 217}^{dust}$ | $1.03^{+0.33}_{-0.31}$          | $r_*$                       | $144.62^{+0.62}_{-0.62}$        | $\sigma_8(2.33)$            | $0.3061^{+0.0046}_{-0.0042}$ |
| $c_{100}$                   | $0.9975^{+0.0021}_{-0.0020}$    | $100\theta_*$               | $1.04105^{+0.00062}_{-0.00061}$ | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $c_{217}$                   | $1.0011^{+0.0031}_{-0.0031}$    | $D_M(z_*)/\text{Gpc}$       | $13.891^{+0.058}_{-0.057}$      | $f_{2000}^{217}$            | $106.7^{+3.8}_{-3.8}$        |
| $c_{TE}$                    | $0.9964^{+0.0096}_{-0.0097}$    | $z_{drag}$                  | $1059.65^{+0.78}_{-0.75}$       | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{EE}$                    | $0.9918^{+0.010}_{-0.0097}$     | $r_{drag}$                  | $147.31^{+0.62}_{-0.63}$        | $\chi_{simall}^2$           | $396.8 (\nu: 1.4)$           |
| $H_0$                       | $67.4^{+1.3}_{-1.2}$            | $k_D$                       | $0.14063^{+0.00071}_{-0.00073}$ | $\chi_{lowl}^2$             | $23.3 (\nu: 0.5)$            |
| $\Omega_\Lambda$            | $0.686^{+0.017}_{-0.017}$       | $100\theta_D$               | $0.16081^{+0.00047}_{-0.00046}$ | $\chi_{CamSpec}^2$          | $11514.4 (\nu: 15.6)$        |
| $\Omega_m$                  | $0.314^{+0.017}_{-0.017}$       | $z_{eq}$                    | $3390^{+61}_{-62}$              | $\chi_{Aver15}^2$           | $0.9 (\nu: 0.8)$             |
| $\Omega_m h^2$              | $0.1425^{+0.0026}_{-0.0026}$    | $k_{eq}$                    | $0.01035^{+0.00019}_{-0.00019}$ | $\chi_{prior}^2$            | $7.8 (\nu: 5.6)$             |
| $\Omega_m h^3$              | $0.09604^{+0.00067}_{-0.00066}$ | $100\theta_{eq}$            | $0.815^{+0.012}_{-0.011}$       | $\chi_{CMB}^2$              | $11934.5 (\nu: 15.7)$        |

$$\bar{\chi}_{eff}^2 = 11943.23; R - 1 = 0.01041$$



16.24 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_zre6p5

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00030}_{-0.00030}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.449^{+0.014}_{-0.013}$       | $D_{\mathrm{M}}(0.38)$      | $1528^{+16}_{-16}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1189^{+0.0020}_{-0.0020}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.602^{+0.014}_{-0.013}$       | $H(0.51)$                   | $89.73^{+0.48}_{-0.46}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04091^{+0.00064}_{-0.00064}$ | $\sigma_8/h^{0.5}$                    | $0.980^{+0.020}_{-0.018}$       | $D_{\mathrm{M}}(0.51)$      | $1980^{+18}_{-18}$           |
| $\tau$                                   | $0.055^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $99.8^{+1.6}_{-1.5}$            | $H(0.61)$                   | $95.33^{+0.41}_{-0.39}$      |
| $Y_{\mathrm{P}}$                         | $0.2440^{+0.0074}_{-0.0075}$    | $\langle d^2 \rangle^{1/2}$           | $2.427^{+0.049}_{-0.046}$       | $D_{\mathrm{M}}(0.61)$      | $2304^{+20}_{-20}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.041^{+0.028}_{-0.026}$       | $z_{\mathrm{re}}$                     | $< 8.89$                        | $H(2.33)$                   | $235.8^{+1.2}_{-1.2}$        |
| $n_{\mathrm{s}}$                         | $0.9670^{+0.0081}_{-0.0082}$    | $10^9 A_{\mathrm{s}}$                 | $2.092^{+0.059}_{-0.055}$       | $D_{\mathrm{M}}(2.33)$      | $5763^{+19}_{-19}$           |
| $y_{\mathrm{cal}}$                       | $1.0004^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.874^{+0.022}_{-0.022}$       | $f\sigma_8(0.15)$           | $0.454^{+0.013}_{-0.013}$    |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{40}$                              | $1224^{+25}_{-25}$              | $\sigma_8(0.15)$            | $0.746^{+0.012}_{-0.011}$    |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5721^{+78}_{-78}$              | $f\sigma_8(0.38)$           | $0.472^{+0.011}_{-0.011}$    |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2534^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.661^{+0.010}_{-0.0096}$   |
| $A_{217}^{\mathrm{CIB}}$                 | $40^{+10}_{-10}$                | $D_{1420}$                            | $815.9^{+9.2}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.4711^{+0.0099}_{-0.0095}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.52$                        | $D_{2000}$                            | $230.4^{+3.2}_{-3.2}$           | $\sigma_8(0.51)$            | $0.6189^{+0.0094}_{-0.0088}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.26}$          | $n_{\mathrm{s},0.002}$                | $0.9670^{+0.0081}_{-0.0082}$    | $f\sigma_8(0.61)$           | $0.4663^{+0.0092}_{-0.0086}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2440^{+0.0074}_{-0.0075}$    | $\sigma_8(0.61)$            | $0.5889^{+0.0089}_{-0.0083}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2453^{+0.0074}_{-0.0075}$    | $f\sigma_8(2.33)$           | $0.2970^{+0.0044}_{-0.0041}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.797^{+0.042}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3063^{+0.0046}_{-0.0043}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.38}_{-0.38}$          | $z_*$                                 | $1089.82^{+0.51}_{-0.50}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.97^{+0.35}_{-0.35}$          | $r_*$                                 | $144.76^{+0.50}_{-0.49}$        | $f_{2000}^{217}$            | $106.6^{+3.9}_{-3.9}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$                         | $1.04113^{+0.00058}_{-0.00058}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.33}_{-0.31}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.904^{+0.047}_{-0.047}$      | $\chi_{\mathrm{simall}}^2$  | $396.9 (\nu: 1.5)$           |
| $c_{100}$                                | $0.9975^{+0.0020}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.71^{+0.76}_{-0.73}$       | $\chi_{\mathrm{lowl}}^2$    | $22.95 (\nu: 0.4)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.44^{+0.52}_{-0.52}$        | $\chi_{\mathrm{CamSpec}}^2$ | $11514.5 (\nu: 15.8)$        |
| $c_{TE}$                                 | $0.9965^{+0.0095}_{-0.0099}$    | $k_{\mathrm{D}}$                      | $0.14052^{+0.00064}_{-0.00067}$ | $\chi_{\mathrm{Aver15}}^2$  | $0.9 (\nu: 0.8)$             |
| $c_{EE}$                                 | $0.9922^{+0.0099}_{-0.0099}$    | $100\theta_{\mathrm{D}}$              | $0.16079^{+0.00047}_{-0.00045}$ | $\chi_{6\mathrm{DF}}^2$     | $0.044 (\nu: 0.0)$           |
| $H_0$                                    | $67.71^{+0.91}_{-0.90}$         | $z_{\mathrm{eq}}$                     | $3375^{+46}_{-45}$              | $\chi_{\mathrm{MGS}}^2$     | $1.37 (\nu: 0.1)$            |
| $\Omega_{\Lambda}$                       | $0.690^{+0.012}_{-0.012}$       | $k_{\mathrm{eq}}$                     | $0.01030^{+0.00014}_{-0.00014}$ | $\chi_{\mathrm{DR12BAO}}^2$ | $4.6 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.012}_{-0.012}$       | $100\theta_{\mathrm{eq}}$             | $0.8182^{+0.0089}_{-0.0085}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1419^{+0.0019}_{-0.0019}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4520^{+0.0046}_{-0.0044}$    | $\chi_{\mathrm{BAO}}^2$     | $5.97 (\nu: 0.5)$            |
| $\Omega_{\mathrm{m}} h^3$                | $0.09605^{+0.00068}_{-0.00064}$ | $H(0.15)$                             | $72.97^{+0.79}_{-0.77}$         | $\chi_{\mathrm{CMB}}^2$     | $11934.4 (\nu: 15.6)$        |
| $\sigma_8$                               | $0.807^{+0.013}_{-0.013}$       | $D_{\mathrm{M}}(0.15)$                | $640.5^{+7.7}_{-7.7}$           |                             |                              |
| $S_8$                                    | $0.819^{+0.025}_{-0.024}$       | $H(0.38)$                             | $83.04^{+0.60}_{-0.57}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11949.07; R - 1 = 0.01536$$



16.25 base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_lensing\_zre6p5

| Parameter                            | 95% limits                      | Parameter                   | 95% limits                      | Parameter                   | 95% limits                   |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_b h^2$                       | $0.02228^{+0.00032}_{-0.00031}$ | $S_8$                       | $0.828^{+0.025}_{-0.026}$       | $D_M(0.15)$                 | $643.3^{+8.8}_{-9.3}$        |
| $\Omega_c h^2$                       | $0.1196^{+0.0023}_{-0.0024}$    | $\sigma_8 \Omega_m^{0.5}$   | $0.454^{+0.014}_{-0.014}$       | $H(0.38)$                   | $82.83^{+0.71}_{-0.65}$      |
| $100\theta_{MC}$                     | $1.04081^{+0.00068}_{-0.00066}$ | $\sigma_8 \Omega_m^{0.25}$  | $0.606^{+0.013}_{-0.013}$       | $D_M(0.38)$                 | $1534^{+18}_{-19}$           |
| $\tau$                               | $0.055^{+0.013}_{-0.011}$       | $\sigma_8/h^{0.5}$          | $0.986^{+0.018}_{-0.018}$       | $H(0.51)$                   | $89.58^{+0.57}_{-0.52}$      |
| $Y_P$                                | $0.2437^{+0.0074}_{-0.0074}$    | $r_{\text{drag}} h$         | $99.2^{+1.9}_{-1.8}$            | $D_M(0.51)$                 | $1986^{+21}_{-22}$           |
| $\ln(10^{10} A_s)$                   | $3.042^{+0.026}_{-0.024}$       | $\langle d^2 \rangle^{1/2}$ | $2.441^{+0.043}_{-0.043}$       | $H(0.61)$                   | $95.21^{+0.47}_{-0.44}$      |
| $n_s$                                | $0.9649^{+0.0088}_{-0.0087}$    | $z_{\text{re}}$             | $< 8.86$                        | $D_M(0.61)$                 | $2311^{+22}_{-24}$           |
| $y_{\text{cal}}$                     | $1.0004^{+0.0048}_{-0.0049}$    | $10^9 A_s$                  | $2.095^{+0.054}_{-0.050}$       | $H(2.33)$                   | $236.2^{+1.4}_{-1.4}$        |
| $A_{100}^{\text{PS}}$                | $240^{+50}_{-50}$               | $10^9 A_s e^{-2\tau}$       | $1.878^{+0.021}_{-0.021}$       | $D_M(2.33)$                 | $5768^{+21}_{-22}$           |
| $A_{143}^{\text{PS}}$                | $39^{+20}_{-20}$                | $D_{40}$                    | $1229^{+25}_{-24}$              | $f\sigma_8(0.15)$           | $0.458^{+0.013}_{-0.013}$    |
| $A_{217}^{\text{PS}}$                | $102^{+30}_{-30}$               | $D_{220}$                   | $5720^{+78}_{-78}$              | $\sigma_8(0.15)$            | $0.748^{+0.010}_{-0.0096}$   |
| $A_{217}^{\text{CIB}}$               | $40^{+10}_{-10}$                | $D_{810}$                   | $2534^{+26}_{-26}$              | $f\sigma_8(0.38)$           | $0.476^{+0.010}_{-0.010}$    |
| $A_{143}^{\text{tSZ}}$               | $< 7.52$                        | $D_{1420}$                  | $815.6^{+9.3}_{-9.5}$           | $\sigma_8(0.38)$            | $0.6624^{+0.0090}_{-0.0081}$ |
| $r_{143 \times 217}^{\text{PS}}$     | $0.66^{+0.26}_{-0.25}$          | $D_{2000}$                  | $230.3^{+3.2}_{-3.3}$           | $f\sigma_8(0.51)$           | $0.4740^{+0.0090}_{-0.0090}$ |
| $r_{143 \times 217}^{\text{CIB}}$    | —                               | $n_{s,0.002}$               | $0.9649^{+0.0088}_{-0.0087}$    | $\sigma_8(0.51)$            | $0.6198^{+0.0081}_{-0.0079}$ |
| $\xi^{\text{tSZ} \times \text{CIB}}$ | —                               | $Y_P$                       | $0.2437^{+0.0074}_{-0.0074}$    | $f\sigma_8(0.61)$           | $0.4688^{+0.0081}_{-0.0082}$ |
| $A^{\text{kSZ}}$                     | —                               | $Y_P^{\text{BBN}}$          | $0.2450^{+0.0074}_{-0.0074}$    | $\sigma_8(0.61)$            | $0.5897^{+0.0078}_{-0.0075}$ |
| $A_{100}^{\text{dust}}$              | $1.00^{+0.38}_{-0.39}$          | Age/Gyr                     | $13.808^{+0.048}_{-0.050}$      | $f\sigma_8(2.33)$           | $0.2972^{+0.0040}_{-0.0038}$ |
| $A_{143}^{\text{dust}}$              | $0.96^{+0.34}_{-0.35}$          | $z_*$                       | $1089.93^{+0.56}_{-0.54}$       | $\sigma_8(2.33)$            | $0.3063^{+0.0044}_{-0.0041}$ |
| $A_{217}^{\text{dust}}$              | $0.97^{+0.20}_{-0.20}$          | $r_*$                       | $144.60^{+0.53}_{-0.53}$        | $f_{2000}^{143}$            | $30^{+6}_{-6}$               |
| $A_{143 \times 217}^{\text{dust}}$   | $1.03^{+0.33}_{-0.30}$          | $100\theta_*$               | $1.04104^{+0.00061}_{-0.00059}$ | $f_{2000}^{217}$            | $106.7^{+3.7}_{-3.8}$        |
| $c_{100}$                            | $0.9975^{+0.0021}_{-0.0020}$    | $D_M(z_*)/\text{Gpc}$       | $13.890^{+0.050}_{-0.050}$      | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $c_{217}$                            | $1.0011^{+0.0032}_{-0.0031}$    | $z_{\text{drag}}$           | $1059.65^{+0.78}_{-0.75}$       | $\chi_{\text{lensing}}^2$   | $9.23 (\nu: 0.2)$            |
| $c_{TE}$                             | $0.9964^{+0.0096}_{-0.0097}$    | $r_{\text{drag}}$           | $147.29^{+0.55}_{-0.54}$        | $\chi_{\text{simall}}^2$    | $396.9 (\nu: 1.4)$           |
| $c_{EE}$                             | $0.9918^{+0.0098}_{-0.0098}$    | $k_D$                       | $0.14066^{+0.00066}_{-0.00068}$ | $\chi_{\text{lowl}}^2$      | $23.38 (\nu: 0.4)$           |
| $H_0$                                | $67.4^{+1.1}_{-1.0}$            | $100\theta_D$               | $0.16081^{+0.00047}_{-0.00045}$ | $\chi_{\text{CamSpec}}^2$   | $11513.9 (\nu: 14.7)$        |
| $\Omega_\Lambda$                     | $0.686^{+0.015}_{-0.014}$       | $z_{\text{eq}}$             | $3392^{+53}_{-54}$              | $\chi_{\text{Aver15}}^2$    | $0.9 (\nu: 0.8)$             |
| $\Omega_m$                           | $0.314^{+0.014}_{-0.015}$       | $k_{\text{eq}}$             | $0.01035^{+0.00016}_{-0.00016}$ | $\chi_{\text{prior}}^2$     | $7.9 (\nu: 5.7)$             |
| $\Omega_m h^2$                       | $0.1426^{+0.0022}_{-0.0023}$    | $100\theta_{\text{eq}}$     | $0.815^{+0.010}_{-0.0098}$      | $\chi_{\text{CMB}}^2$       | $11943.4 (\nu: 15.7)$        |
| $\Omega_m h^3$                       | $0.09605^{+0.00067}_{-0.00064}$ | $100\theta_{s,\text{eq}}$   | $0.4503^{+0.0053}_{-0.0051}$    |                             |                              |
| $\sigma_8$                           | $0.809^{+0.011}_{-0.011}$       | $H(0.15)$                   | $72.68^{+0.95}_{-0.88}$         |                             |                              |

$$\bar{\chi}_{\text{eff}}^2 = 11952.14; R - 1 = 0.01491$$



**16.26**    **base\_yhe\_CamSpecHM\_TTTEEE\_lowl\_lowE\_Aver15\_post\_BAO\_lensing\_zre6p5**

| Parameter                                | 95% limits                      | Parameter                             | 95% limits                      | Parameter                   | 95% limits                   |
|--|---------------------------------|---------------------------------------|---------------------------------|-----------------------------|------------------------------|
| $\Omega_{\mathrm{b}} h^2$                | $0.02233^{+0.00030}_{-0.00029}$ | $\sigma_8 \Omega_{\mathrm{m}}^{0.5}$  | $0.450^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.38)$      | $1529^{+15}_{-15}$           |
| $\Omega_{\mathrm{c}} h^2$                | $0.1190^{+0.0019}_{-0.0018}$    | $\sigma_8 \Omega_{\mathrm{m}}^{0.25}$ | $0.603^{+0.011}_{-0.011}$       | $H(0.51)$                   | $89.71^{+0.46}_{-0.44}$      |
| $100\theta_{\mathrm{MC}}$                | $1.04089^{+0.00064}_{-0.00064}$ | $\sigma_8/h^{0.5}$                    | $0.983^{+0.016}_{-0.016}$       | $D_{\mathrm{M}}(0.51)$      | $1981^{+17}_{-18}$           |
| $\tau$                                   | $0.056^{+0.013}_{-0.012}$       | $r_{\mathrm{drag}} h$                 | $99.7^{+1.5}_{-1.4}$            | $H(0.61)$                   | $95.32^{+0.40}_{-0.38}$      |
| $Y_{\mathrm{P}}$                         | $0.2439^{+0.0074}_{-0.0074}$    | $\langle d^2 \rangle^{1/2}$           | $2.433^{+0.040}_{-0.039}$       | $D_{\mathrm{M}}(0.61)$      | $2305^{+18}_{-19}$           |
| $\ln(10^{10} A_{\mathrm{s}})$            | $3.044^{+0.026}_{-0.025}$       | $z_{\mathrm{re}}$                     | $7.8^{+1.2}_{-1.3}$             | $H(2.33)$                   | $235.9^{+1.1}_{-1.2}$        |
| $n_{\mathrm{s}}$                         | $0.9664^{+0.0080}_{-0.0080}$    | $10^9 A_{\mathrm{s}}$                 | $2.099^{+0.055}_{-0.052}$       | $D_{\mathrm{M}}(2.33)$      | $5764^{+18}_{-19}$           |
| $y_{\mathrm{cal}}$                       | $1.0006^{+0.0048}_{-0.0048}$    | $10^9 A_{\mathrm{s}} e^{-2\tau}$      | $1.876^{+0.021}_{-0.020}$       | $f\sigma_8(0.15)$           | $0.455^{+0.011}_{-0.011}$    |
| $A_{100}^{\mathrm{PS}}$                  | $239^{+50}_{-50}$               | $D_{40}$                              | $1226^{+23}_{-23}$              | $\sigma_8(0.15)$            | $0.747^{+0.011}_{-0.0098}$   |
| $A_{143}^{\mathrm{PS}}$                  | $39^{+20}_{-20}$                | $D_{220}$                             | $5725^{+77}_{-77}$              | $f\sigma_8(0.38)$           | $0.4735^{+0.0090}_{-0.0090}$ |
| $A_{217}^{\mathrm{PS}}$                  | $102^{+30}_{-30}$               | $D_{810}$                             | $2535^{+26}_{-26}$              | $\sigma_8(0.38)$            | $0.6623^{+0.0089}_{-0.0088}$ |
| $A_{217}^{\mathrm{CIB}}$                 | $39^{+10}_{-10}$                | $D_{1420}$                            | $816.2^{+9.2}_{-9.4}$           | $f\sigma_8(0.51)$           | $0.4723^{+0.0081}_{-0.0081}$ |
| $A_{143}^{\mathrm{tSZ}}$                 | $< 7.51$                        | $D_{2000}$                            | $230.5^{+3.1}_{-3.1}$           | $\sigma_8(0.51)$            | $0.6199^{+0.0084}_{-0.0082}$ |
| $r_{143 \times 217}^{\mathrm{PS}}$       | $0.66^{+0.26}_{-0.25}$          | $n_{\mathrm{s},0.002}$                | $0.9664^{+0.0080}_{-0.0080}$    | $f\sigma_8(0.61)$           | $0.4674^{+0.0076}_{-0.0075}$ |
| $r_{143 \times 217}^{\mathrm{CIB}}$      | —                               | $Y_{\mathrm{P}}$                      | $0.2439^{+0.0074}_{-0.0074}$    | $\sigma_8(0.61)$            | $0.5899^{+0.0080}_{-0.0078}$ |
| $\xi^{\mathrm{tSZ} \times \mathrm{CIB}}$ | —                               | $Y_{\mathrm{P}}^{\mathrm{BBN}}$       | $0.2452^{+0.0074}_{-0.0075}$    | $f\sigma_8(2.33)$           | $0.2975^{+0.0041}_{-0.0040}$ |
| $A^{\mathrm{kSZ}}$                       | —                               | Age/Gyr                               | $13.799^{+0.042}_{-0.044}$      | $\sigma_8(2.33)$            | $0.3067^{+0.0044}_{-0.0042}$ |
| $A_{100}^{\mathrm{dust}}$                | $1.00^{+0.38}_{-0.39}$          | $z_*$                                 | $1089.84^{+0.50}_{-0.47}$       | $f_{2000}^{143}$            | $29^{+6}_{-6}$               |
| $A_{143}^{\mathrm{dust}}$                | $0.96^{+0.34}_{-0.35}$          | $r_*$                                 | $144.72^{+0.45}_{-0.45}$        | $f_{2000}^{217}$            | $106.6^{+3.8}_{-3.9}$        |
| $A_{217}^{\mathrm{dust}}$                | $0.97^{+0.20}_{-0.21}$          | $100\theta_*$                         | $1.04112^{+0.00058}_{-0.00058}$ | $f_{2000}^{143 \times 217}$ | $32^{+4}_{-4}$               |
| $A_{143 \times 217}^{\mathrm{dust}}$     | $1.03^{+0.33}_{-0.30}$          | $D_{\mathrm{M}}(z_*)/\mathrm{Gpc}$    | $13.900^{+0.042}_{-0.044}$      | $\chi_{\mathrm{lensing}}^2$ | $9.23 (\nu: 0.2)$            |
| $c_{100}$                                | $0.9975^{+0.0021}_{-0.0021}$    | $z_{\mathrm{drag}}$                   | $1059.71^{+0.75}_{-0.74}$       | $\chi_{\mathrm{simall}}^2$  | $397.1 (\nu: 1.6)$           |
| $c_{217}$                                | $1.0011^{+0.0031}_{-0.0031}$    | $r_{\mathrm{drag}}$                   | $147.40^{+0.48}_{-0.49}$        | $\chi_{\mathrm{lowl}}^2$    | $23.11 (\nu: 0.3)$           |
| $c_{TE}$                                 | $0.9964^{+0.0096}_{-0.0097}$    | $k_{\mathrm{D}}$                      | $0.14056^{+0.00062}_{-0.00065}$ | $\chi_{\mathrm{CamSpec}}^2$ | $11514.0 (\nu: 14.9)$        |
| $c_{EE}$                                 | $0.9921^{+0.0099}_{-0.0099}$    | $100\theta_{\mathrm{D}}$              | $0.16079^{+0.00047}_{-0.00044}$ | $\chi_{\mathrm{Aver15}}^2$  | $0.9 (\nu: 0.8)$             |
| $H_0$                                    | $67.65^{+0.88}_{-0.84}$         | $z_{\mathrm{eq}}$                     | $3378^{+42}_{-42}$              | $\chi_{6\mathrm{DF}}^2$     | $0.048 (\nu: 0.0)$           |
| $\Omega_{\Lambda}$                       | $0.690^{+0.011}_{-0.011}$       | $k_{\mathrm{eq}}$                     | $0.01031^{+0.00013}_{-0.00013}$ | $\chi_{\mathrm{MGS}}^2$     | $1.30 (\nu: 0.1)$            |
| $\Omega_{\mathrm{m}}$                    | $0.310^{+0.011}_{-0.011}$       | $100\theta_{\mathrm{eq}}$             | $0.8175^{+0.0080}_{-0.0078}$    | $\chi_{\mathrm{DR12BAO}}^2$ | $4.7 (\nu: 0.8)$             |
| $\Omega_{\mathrm{m}} h^2$                | $0.1420^{+0.0018}_{-0.0018}$    | $100\theta_{\mathrm{s,eq}}$           | $0.4516^{+0.0041}_{-0.0040}$    | $\chi_{\mathrm{prior}}^2$   | $7.8 (\nu: 5.8)$             |
| $\Omega_{\mathrm{m}} h^3$                | $0.09606^{+0.00067}_{-0.00064}$ | $H(0.15)$                             | $72.91^{+0.76}_{-0.73}$         | $\chi_{\mathrm{CMB}}^2$     | $11943.4 (\nu: 15.6)$        |
| $\sigma_8$                               | $0.808^{+0.012}_{-0.011}$       | $D_{\mathrm{M}}(0.15)$                | $641.0^{+7.3}_{-7.4}$           | $\chi_{\mathrm{BAO}}^2$     | $6.02 (\nu: 0.5)$            |
| $S_8$                                    | $0.822^{+0.021}_{-0.021}$       | $H(0.38)$                             | $83.00^{+0.57}_{-0.54}$         |                             |                              |

$$\bar{\chi}_{\mathrm{eff}}^2 = 11958.15; R - 1 = 0.01663$$