

CMB power spectra and parameters from Planck PR4 (NPIPE) with CamSpec

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Introduction

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- Different treatment of 4K-cooler lines and glitches
- Detector-set splits A and B rather than half-missions (HM1, HM2)

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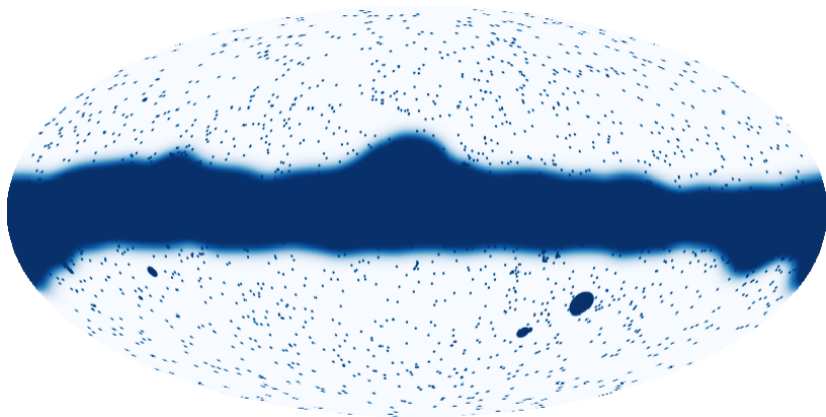
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 - Use 545 GHz as a dust template in temperature, and 353 GHz in polarization
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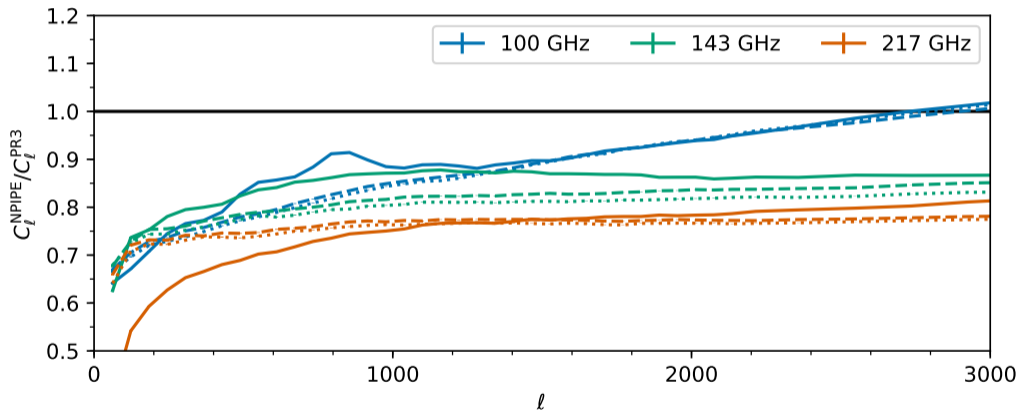
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- Noise estimates from odd-even ring (PR3) and half-ring (PR4) differences

143 GHz T & All Polarization



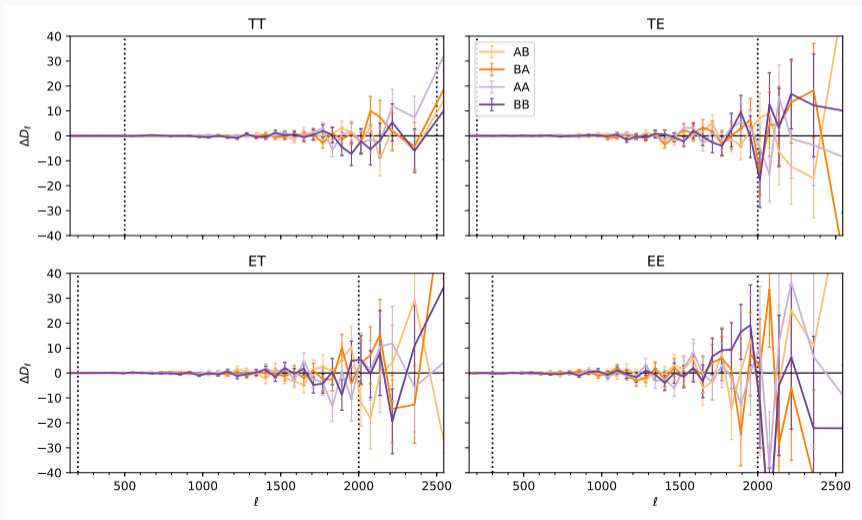
Noise comparison

Noise power spectra from simulations: NPIPE / PR3



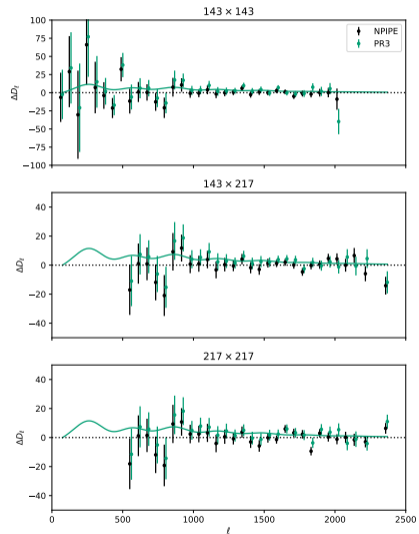
Correlated noise

NPIPE (143hr1-143hr2) × (217hr1-217hr2)

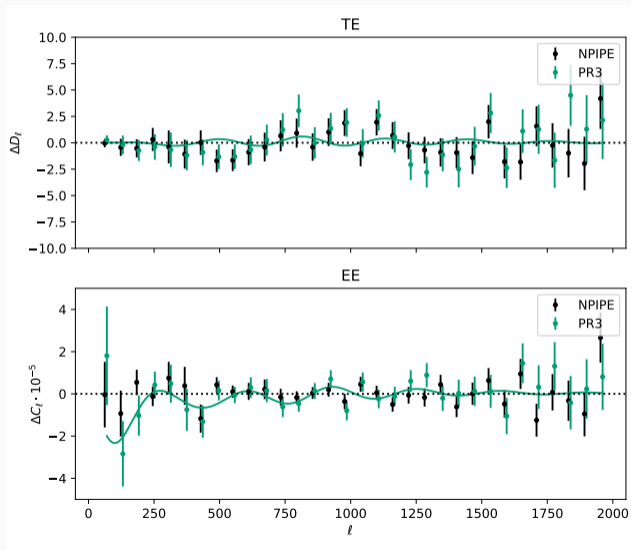


Spectra

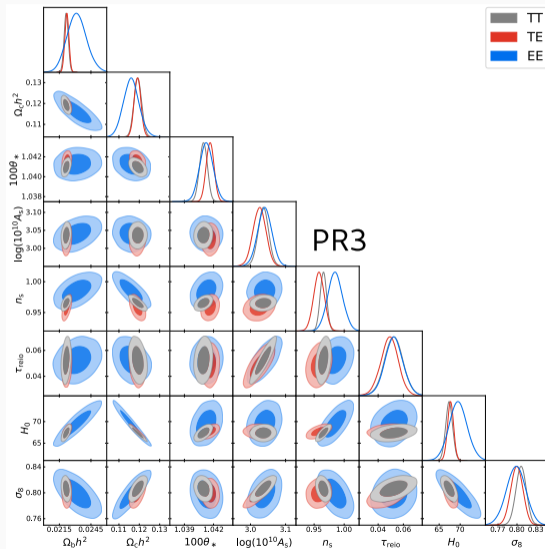
Temperature

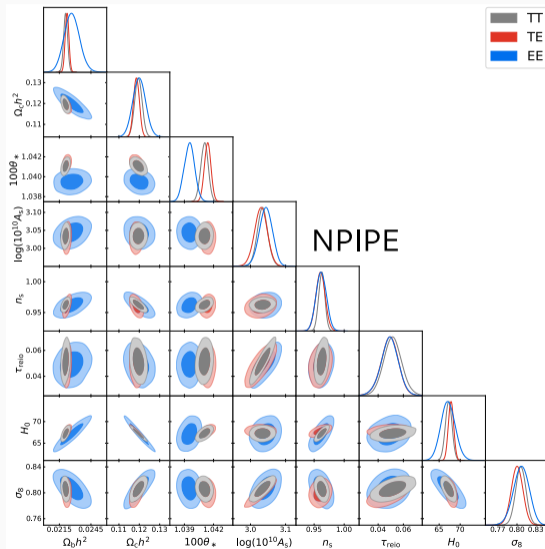


Polarization

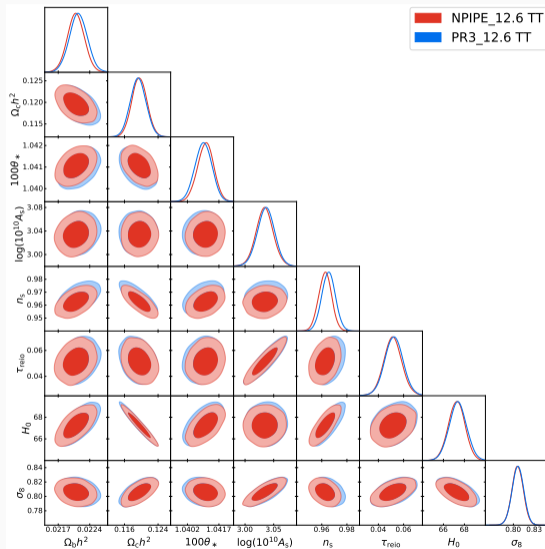


Likelihood and Cosmological Parameters

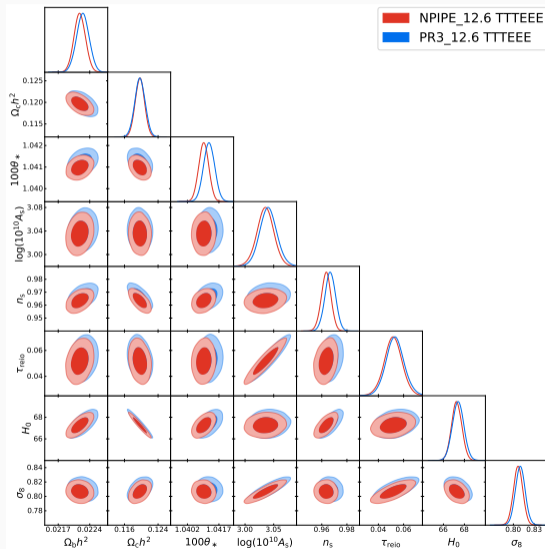




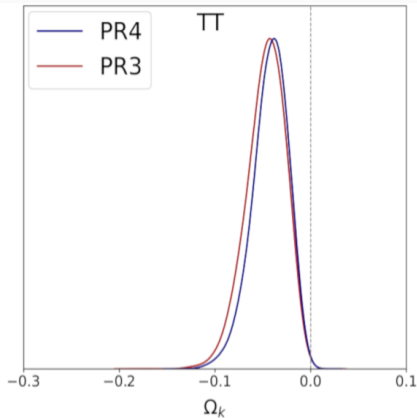
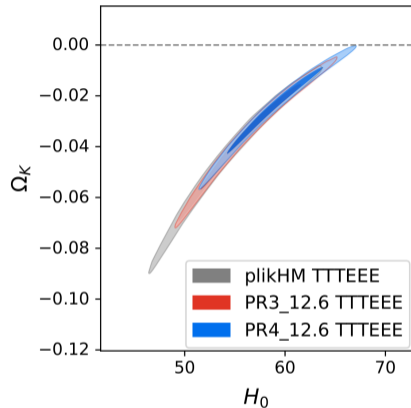
NPIPE vs PR3 Λ CDM TT



NPIPE vs PR3 Λ CDM TTTEEE

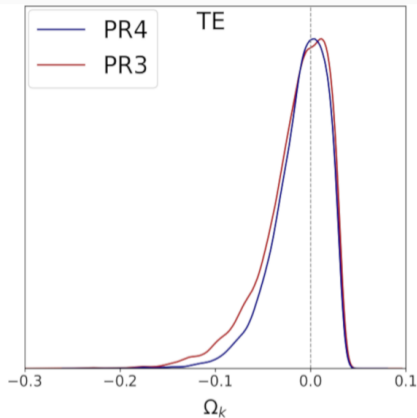
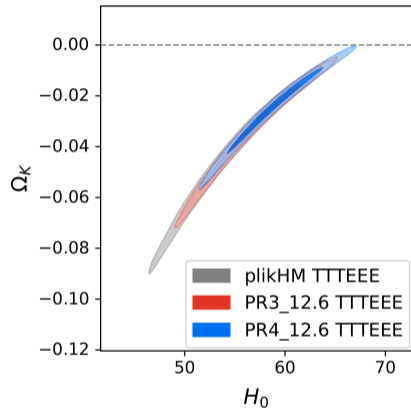


Extended Models: Ω_K



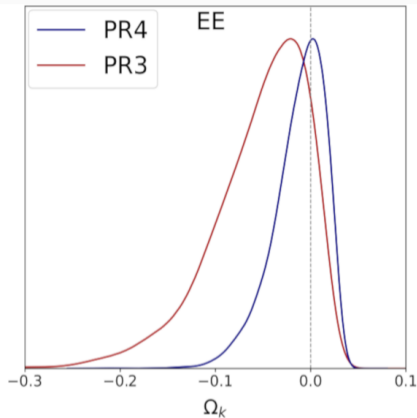
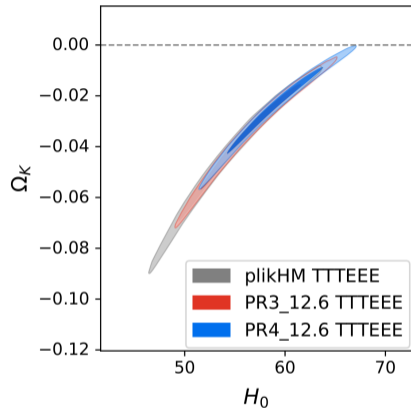
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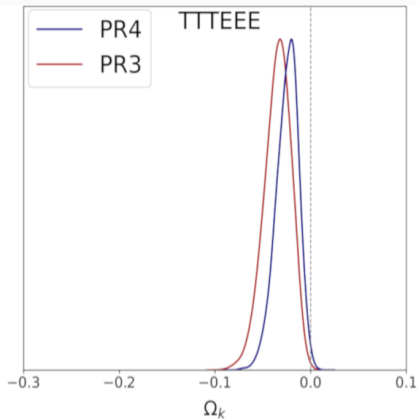
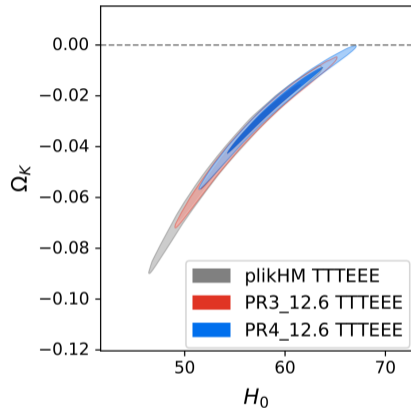
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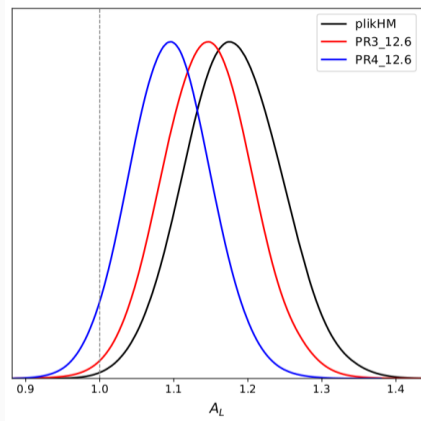
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Extended Models: A_L



- PR3_12.6 TTTEEE: $A_L = 1.146 \pm 0.061$; Best-fit $1.141(2.3\sigma > 1)$
- NPIPE TTTEEE: $A_L = 1.095 \pm 0.056$; Best-fit $1.084(1.5\sigma > 1)$

Conclusions

- Spectra and parameter-level results show a cosmology consistent with *Planck* 2018 and Efstathiou & Gratton 2019 despite different analysis choices
- Differences most significant in polarization (EE) with significantly smaller errors (20-30% on marginalized parameters) and shifts in θ_* and n_s
- 10-30% reduction in noise levels lead to $\sim 10\%$ improvement in marginalized Λ CDM parameter constraints from TTTEEE
- Continuing trend of less preference for $A_L > 1$ or $\Omega_K < 0$ as more data is added

Rosenberg, Gratton & Efstathiou 2022 (arXiv: 2205.10869)