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Alleviate S8 tension by introducing scale dependence beyond power-law in the primordial power spectrum

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There is an approximately 2-sigma discrepancy between the S8 values measured from CMB and CMB lensing, which probe large scales, and the values measured from the weak lensing survey, which is sensitive to small scales. This discrepancy, known as the "S8 tension", can be regarded as a tension between large and small scales. These results are based on the standard LCDM model, which assumes a simple power-law form for the primordial power spectrum. In this talk, we explore whether introducing more complex scale dependence in the primordial power spectrum, such as allowing the spectral index to vary with scale (known as spectral index running), can help alleviate this tension. We present the joint analysis of Planck CMB, CMB lensing from ACT DR6, and cosmic shear data from HSC-Y3.

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