

Late Time Modification of Structure Growth and the S_8 Tension

Wednesday, 8 May 2024 08:40 (10 minutes)

The S_8 tension between low-redshift galaxy surveys and the primary CMB signals a possible breakdown of the Λ CDM model.

Recently differing results have been obtained using low-redshift galaxy surveys and the higher redshifts probed by CMB lensing, motivating a possible time-dependent modification to the growth of structure.

We investigate a simple phenomenological model in which the growth of structure deviates from the Λ CDM prediction at late times, in particular as a simple function of the dark energy density. Fitting to galaxy lensing, CMB lensing, BAO, and Supernovae datasets, we find significant evidence - $2.5 - 3\sigma$, depending on analysis choices - for a non-zero value of the parameter quantifying a deviation from Λ CDM.

The preferred model, which has a slower growth of structure below $z \sim 1$, improves the joint fit to the data over Λ CDM.

While the overall fit is improved, there is weak evidence for galaxy and CMB lensing favoring different changes in the growth of structure.

The upcoming large-scale structure surveys can further test this model.

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Session Classification: Session 9