



Contribution ID: 132

Type: **not specified**

Unveiling dark fifth forces with linear cosmology and LSS

Thursday 31 August 2023 17:25 (25 minutes)

We investigate the imprints of new long-range forces mediated by a new light scalar acting solely on dark matter. Dark fifth forces in general will modify the background evolution as well as the growth of density fluctuations. At the linear level, constraints are derived from CMB together with a full-shape analysis of the power spectrum as measured by BOSS. At the non-linear level, the presence of fifth forces induces violation of the equivalence principle in cosmological correlators. This is encoded in the breaking of consistency relations at tree level for the bispectrum, which could be directly tested with future galaxy surveys. Combining this information with the full shape power spectrum at one loop leads to an unprecedented sensitivity on dark fifth forces.

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Session Classification: Parallel