



Contribution ID: 183

Type: Talk

Disentangling Modified Gravity and Massive Neutrinos with Intrinsic Shape Alignments of Massive Halos

Monday 8 September 2025 16:30 (30 minutes)

We present a new diagnostics based on the intrinsic shape alignments of group/cluster size dark matter halos to disentangle the effect of $f(R)$ gravity from that of massive neutrinos. Using the snapshot data from a series of the DUSTGRAIN-pathfinder N-body simulations for the Planck Λ CDM cosmology and three $f(R)$ gravity models with massive neutrinos, we first determine the probability density functions of the alignment angles between the shape orientations of massive halos and the minor principal axes of the local tidal fields. The numerically obtained results turn out to agree very well with the analytic formula derived under the assumption that the anisotropic merging along the cosmic web induces the halo shape alignments. The four cosmologies, which several standard diagnostics failed to discriminate, are found to yield significantly different best-fit values of the single parameter that characterizes the analytic formula.

References

Astrophys. J. 945 (2023) 15

Author: LEE, Jounghun

Co-author: BALDI, Marco (Bologna University)

Presenter: LEE, Jounghun

Session Classification: Afternoon session

Track Classification: Fundamental aspects of Cosmology.