



Contribution ID: 4

Type: **Talk in a parallel session**

On the uniqueness of Λ CDM-like evolution for homogeneous and isotropic cosmology in General Relativity

Friday, 12 July 2024 15:50 (20 minutes)

The Λ -ColdDarkMatter model, despite being in well agreement with many observational datasets at the background level, exhibits a growth of perturbations troubled by some inconsistencies: the H_0 and σ_8 tensions. Adopting a theoretical perspective, this opens the question about the possibility of having a cosmological model, based on other than a cosmological constant and a pressureless dark matter degrees of freedom, whose background cosmic history is as in Λ CDM. Tuning the novel degrees of freedom can potentially resolve the issues arising at the perturbation level. Therefore, in my talk I will discuss some models with cosmographic jerk parameter $j=1$ all along their evolutions (as from the statefinder diagnostic, this is enough for reproducing the Λ CDM at the background level, but for very specific models with deceleration parameter $q=1/2$). Our class of models will be based on interactions in the dark sector in which dark energy is accounted for by either a non-ideal fluid or a canonical scalar field, while we maintain the assumptions of general relativity as the gravitational theory, and of homogeneity and isotropy as in the usual Friedman scenario. By applying dynamical system techniques, I will show that coupled fluid-fluid models with non-phantom fluids or coupled quintessence models with power law and exponential potentials can never reproduce a cosmological evolution similar to that of the Λ CDM. Hence, assuming those tensions to be a genuine manifestation of some cosmological effects, we may need to resolve them by invoking some different extensions of the current standard model. My talk will be based on Phys. Lett. B 842 (2023) 137962, 2208.04596 [gr-qc].

Primary authors: MISHRA, B.; GREGORIS, Daniele (Jiangsu University of Science and Technology); CHAKRABORTY, Saikat

Presenter: GREGORIS, Daniele (Jiangsu University of Science and Technology)

Session Classification: Current status of the H_0 and growth tensions: theoretical models and model-independent constraints

Track Classification: Cosmic Microwave Background, Cosmological Tensions (CM): Current Status of the H_0 and growth tensions: theoretical models and model-independent constraints