



Contribution ID: 442

Type: **Invited talk in the parallel session**

BD- Λ CDM and running vacuum models: theoretical background and current observational status

Wednesday, 7 July 2021 10:55 (22 minutes)

We study Brans-Dicke gravity with a cosmological constant and cold dark matter (BD- Λ CDM hereafter). This theory is the first historical attempt to extend Einstein's General Relativity by promoting the Newtonian coupling constant G_N to a dynamical one $G(t)$. We present the background and the perturbation equations, which allows us to test the theoretical predictions with a complete and updated data string, formed by: CMB+BAO+LSS+ $H(z)$ +SNIa. Additionally, we contemplate the possibility of including alternative data in order to cover a wide variety of different scenarios. The BD- Λ CDM turns out to be observationally favored as compared to the concordance model (GR- Λ CDM). We pay special attention to the ability of the BD- Λ CDM model to smooth out not only the H_0 -tension but also the σ_8 one. An exhaustive study can be found in arXiv:2006.04273. Due to the possible connection with the running vacuum models (RVM's) (see arXiv:2102.12758 and references therein), where a time-evolving vacuum energy density in the context of QFT is considered, we deem it is worthwhile to also present the background and the perturbation equations, as well as, the performance, of this kind of models, when they are put in the light of the observational data.

Primary author: DE CRUZ PÉREZ, Javier (University of Barcelona)

Presenter: DE CRUZ PÉREZ, Javier (University of Barcelona)

Session Classification: Status of the H_0 and Σ_8 Tensions: Theoretical Models and Model-Independent Constraints

Track Classification: Cosmic Microwave Background: Status of the H_0 and σ_8 tensions: theoretical models and model-independent constraints