7th IDPASC/LIP PhD Students Workshop



Contribution ID: 15

Type: not specified

Generalizing models with variations of the fine-structure constant driven by scalar fields: extended Bekenstein model coupled to the dark sector

Thursday, 7 July 2022 14:25 (10 minutes)

Seeking for the variation of fundamental constants is a crucial step in our quest to go beyond our standard models of fundamental physics. Implementing such variations in a self-consistent way can be achieved by coupling a scalar field to the theory. In the generalized Bekenstein model the field is coupled to both dark matter and the cosmological constant, leading to variations of the fine-structure constant and subsequent EP violations. In this work we constrain this model by treating the full cosmological evolution of the field using a synergy between astrophysical, cosmological, and local measurements. We show that couplings of order unity are excluded, imposing strong restrictions on theoretical frameworks aiming to deal with variations of the fundamental constants.

Primary author: DIAS, João (Centro de Astrofísica da Universidade do Porto)
Presenter: DIAS, João (Centro de Astrofísica da Universidade do Porto)
Session Classification: Scientific session