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Constraining the interactions in the dark sector with cosmological data

Tuesday, 6 July 2021 10:33 (23 minutes)

In this talk I will show up-to-date cosmological constraints on the interactions between dark matter and the component that might be driving the current acceleration of the universe. In particular, I will explain what is the status of two different theoretical models: (i) coupled quintessence, with a fifth force between dark matter particles, mediated by a scalar field that plays the role of dark energy; and (ii) the Ricci running vacuum models, with an energy exchange between the vacuum and dark matter sectors that is highly suppressed during the radiation-dominated era. In this case, the impact of a late-time activation of the interaction will be also discussed. We have constrained the models with the full Planck 2018 CMB data, together with the Pantheon compilation of supernovae of Type Ia, cosmic chronometers, baryon acoustic oscillations and the large-scale structure information obtained by various teams and galaxy surveys. I will of course also comment on the ability of these models to loosen the H_0 and σ_8 tensions. This talk is based on the following two arXiv papers: 2004.00610 and 2102.12758.

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