Contribution ID: **44** Type: **Talk/seminar**

Observational constraints on cosmological solutions of f(Q) theories

Friday 10 September 2021 12:30 (20 minutes)

Over the last years some interest has been gathered by f(Q) theories, which are new candidates to replace Einstein's prescription for gravity. The nonmetricity tensor Q allows to put forward the assumption of a free torsionless connection and, consequently, new degrees of freedom in the action are taken into account. This work focuses on a class of f(Q) theories, characterized by the presence of a general power-law term which adds up to the standard (linear in) Q term in the action, and on new cosmological scenarios arising from them. Using the Markov chain Monte Carlo method, we carry out statistical tests relying upon background data such as Type Ia supernovae luminosities and direct Hubble data (from cosmic clocks), along with cosmic microwave background shift and baryon acoustic oscillations data. This allows us to perform a multifaceted comparison between these new cosmologies and the (concordance) ΛCDM setup. We conclude that, at the current precision level, the best fits of our f(Q) models correspond to values of their specific parameters which make them hardly distinguishable from our general relativity "échantillon,"that is, ΛCDM.

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Session Classification: Regular Sessions