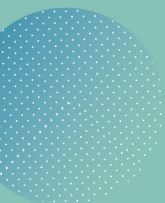




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Nonlocal Gravity, Restricted CPL Dynamics and DESI Constraints

by L. Amendola, et al., (including J. Rubio)

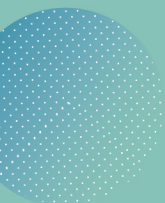
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Abstract

Nonlocal modifications of gravity provide a theoretically motivated framework in which cosmic acceleration can emerge dynamically without introducing a fundamental cosmological constant. We revisit the cosmological predictions of the Maggiore--Mancarella nonlocal $R \square - 2R$ model, with particular emphasis on its background dynamics and observational viability in light of recent DESI baryon acoustic oscillation measurements. A key feature of the theory is its predictive character: for fixed standard cosmological parameters, each value of the nonlocal parameter determines a specific effective pair (w_0, w_a) , so that the model traces a restricted trajectory in the Chevallier--Polarski-Linder plane rather than spanning the full phenomenological parameter space. We construct this mapping explicitly and confront the model with observations by implementing its cosmological dynamics in a Boltzmann solver and performing a Markov chain Monte Carlo analysis using Cosmic Microwave Background, supernova, and DESI BAO data. We find that current datasets constrain the nonlocal parameter close to the Λ CDM limit, with no statistically significant preference for nonlocal deviations.

