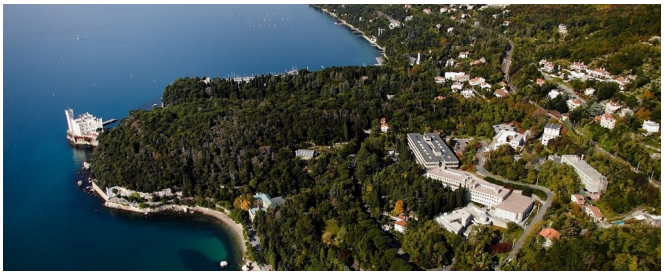

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f(R) gravity with broken Weyl gauge symmetry and its effects on cosmological evolution

Friday 1 September 2023 21:50 (5 minutes)

We propose a new class of f(R) theory where its Weyl gauge symmetry is broken in the primordial era of the universe. Due to the geometrical nature of the symmetry, the symmetry breaking induces an additional non-minimal coupling of the scalar field corresponding to the f(R) model. This cannot be expected in the standard f (R) theories. We explain how this affects the evolution of the universe at cosmological scales in two parts: cosmological backreaction and CMB spectra. first, for some specific f(R) dark energy models, the effective values of the Planck constant and the cosmological constant may shift through time even though there is no change in the background evolution. This can be regarded as a genuine exemplification of the cosmological backreaction. Moreover, we prove that for f(R) inflationary models, the amplitude of the primordial gravitational waves affects the evolution of scalar perturbation, which turns out to affect the low-l multipoles of the CMB temperature anisotropy.

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