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Some cosmological solutions in nonlocal gravity

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Abstract. Despite its theoretical beauty and many phenomenological evidences, general relativity is not a complete theory and should be modified. There are many its modifications, which are motivated by quantum gravity, string theory, astrophysics and cosmology. One of very promising directions of research is nonlocal modified gravity and its applications to cosmology. In this contribution we consider model of nonlocal gravity without matter, given by the following action

$$S = \frac{1}{16\pi G}\int \sqrt{R-2\Lambda}\, F(\Box)\sqrt{R-2\Lambda}\sqrt{-g}\, d^4x,$$

where R is Ricci scalar curvature, Λ cosmological constant and $F(\Box) = 1 + \mathcal{F}(\Box) = 1 + \sum_{n=1}^{\infty} f_n \Box^n$. The corresponding Einstein equations of motion are derived and presented. Using ansatze we can solve equations of motion and get some cosmological solutions.

This is joint work with I. Dimitrijevic, B. Dragovich and Z. Rakic.

Keywords: modified gravity; nonlocal gravity; cosmological solutions.