On nonlocal modified gravity with cosmological solutions

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In this talk, we consider nonlocal gravity action without matter in the form

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

where $\mathcal{F}(\Box)$ is an analytic function of the d'Alembertian $\Box$ and $p = +1, -1$. We present a few $a(t)$ nonsingular bounce cosmological solutions for the above two actions using $FLRW$ metric. see references [1-5].

[1] T. Biswas, T. Koivisto, A. Mazumdar, "Towards a resolution of the cosmological singularity in non-local higher derivative theories of gravity", JCAP **1011** (2010) 008 [arXiv:1005.0590v2 [hep-th]]. [2] A. S. Koshelev, S. Yu. Vernov, "On bouncing solutions in non-local gravity", Phys. Part. Nuclei **43**, 666–668 (2012)[arXiv:1202.1289v1 [hep-th]]. [3] T. Biswas, A. S. Koshelev, A. Mazumdar, S. Yu. Vernov, "Stable bounce and inflation in non-local higher derivative cosmology", JCAP **08** (2012) 024, [arXiv:1206.6374v2 [astro-ph.CO]]. [4] I. Dimitrijevic, B. Dragovich, J. Grujic, Z. Rakic, "New cosmological solutions in nonlocal modified gravity", Rom. Journ. Phys. **58** (5-6), 550–559 (2013) [arXiv:1302.2794 [gr-qc]]. [5] I. Dimitrijevic, B. Dragovich, J. Grujic, Z. Rakic, "A new model of nonlocal modified gravity", Publications de l'Institut Mathematique **94** (108), 187–196 (2013).

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