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Nonlocal Gravity Model and its Cosmological Solutions

Thursday, 1 September 2022 15:40 (10 minutes)

A nonlocal gravity model

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

was recently introduced, and two exact cosmological solutions in flat space were presented.

One solution has similar properties to an interplay between the radiation and the dark energy, while the other one is a nonsingular time symmetric bounce. In this talk we investigate other possible exact cosmological solutions and find some new ones in nonflat space. Used nonlocal gravity dynamics can change background topology. To solve the corresponding equations of motion, we first look for a solution of the eigenvalue problem

$\Box x(R - 4\Lambda) = q(R - 4\Lambda)$. We also discuss possible extension of this model with nonlocal operator symmetric under

$$\Box x \longleftrightarrow$$

$\Box x^{-1}$ and its connection with another interesting nonlocal gravity model.

This talk is based on joint work with Branko Dragovich, Zoran Rakić and Jelena Stanković.

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