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Bimetric gravity from the spectral point of view

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Bimetric gravity models originated from the ghost-free Hassan-Rosen theory are known as a possible extensions of the standard cosmological model. These models are characterized by an action that contains few free coefficients which combinations can be used to define parameters that characterize cosmological scenarios.Since even slight change in these parameters may have a huge impact on the resulting scenario and therefore it is crucial to have an explanation of the origin of these at first sight free parameters. We propose a new method to determine these ambiguous freedom that is originated from the Connes'noncommutative geometry and previously used in the context of Lott's cosmology and also for the Standard Model of Particle Physics. We propose to use the tools of spectral geometry to determine relations between parameters in the bimetric gravity models using the geometric construction of spectral triples and methods of Wodzicki residuum computation for generalized Dirac operators. The main ideas will be presented together with some preliminary results. This is still work in progress, so the presentation will be mostly dedicated to the overview of the method rather than the computational results.

Summary

In this overview we will make a proposal for the possible explanation of the origin of parameters for bimetric gravity models. The main ideas and the methodology will be presented.

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