Anisotropic deformations of spatially open cosmology in massive gravity theory

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Abstract

© 2017 IOP Publishing Ltd and Sissa Medialab srl . We combine analytical and numerical methods to study anisotropic deformations of the spatially open homogeneous and isotropic cosmology in the ghost free massive gravity theory with flat reference metric. We find that if the initial perturbations are not too strong then the physical metric relaxes back to the isotropic de Sitter state. However, the dumping of the anisotropies is achieved at the expense of exciting the Stueckelberg fields in such a way that the reference metric changes and does not share anymore with the physical metric the same rotational and translational symmetries. As a result, the universe evolves towards a fixed point which does not coincide with the original solution, but for which the physical metric is still de Sitter. If the initial perturbation is strong, then its evolution generically leads to a singular anisotropic state or, for some parameter values, to a decay into flat spacetime. We also present an infinite dimensional family of new homogeneous and isotropic cosmologies in the theory.

Keywords

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