



Contribution ID: 471

Type: **Talk in a parallel session**

Embedding LTB models in mimetic gravity and exact spherically symmetric solutions

Friday, 12 July 2024 16:10 (20 minutes)

In this talk we present the analysis of a large class of extended mimetic gravity Lagrangians, which allow the embedding of the Lemaître-Tolman-Bondi (LTB) models in spherically symmetric spacetimes. Using the LTB embedding, we are able to completely decouple the dynamics along the radial direction and obtain exact solutions of the modified Friedmann equations. Moreover, we introduce a reconstruction algorithm that allows, for a large class of models, to construct from a given metric in Schwarzschild-like coordinates the corresponding dynamics as a 1+1-dimensional field theory, as well as a corresponding extended mimetic gravity Lagrangian in four dimensions. Such a reconstruction allows us to obtain Lagrangians of extended mimetic gravity models for black hole models with a regular center, e.g. of Bardeen and Hayward, as well as for effective loop quantum gravity inspired models. Moreover, the reconstruction allows us to extend static black hole models to general non-marginally bound inhomogeneous dust collapse solutions of the corresponding theory.

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Session Classification: Black holes in alternative theories of gravity

Track Classification: Black Holes: Classical and Beyond (BH): Black holes in alternative theories of gravity