



Contribution ID: 163

Type: **Invited talk in the parallel session**

Double-layer wormholes in quadratic hybrid metric-Palatini gravity

Tuesday, 6 July 2021 11:00 (15 minutes)

In this work, we explore the existence of traversable wormhole solutions supported by double-layer thin-shells and satisfying the Null Energy Condition (NEC) throughout the whole spacetime, in a quadratic form of the generalized hybrid metric-Palatini gravity. We start by showing that for a particular quadratic form of the action, some of the junction conditions of the theory can be discarded without the appearance of undefined distribution terms in the field equations. As a consequence, a double-layer thin-shell arises at the separation hypersurface. We then outline a general method to find traversable wormhole solutions satisfying the NEC at the throat and provide an example. Finally, we use the previously derived junction conditions to match the interior wormhole solution to an exterior vacuum and asymptotic flat solution, thus obtaining a full traversable wormhole solution supported by a double-layer thin-shell and satisfying the NEC. Unlike the wormhole solutions previously obtained in the scalar-tensor representation of this theory, which were scarce and required fine-tuning, the solutions obtained through this method are numerous and exist for a wide variety of metrics and actions.

Primary authors: ROSA, João (University of Tartu); LEMOS, José; ANDRÉ, Rui

Presenter: ROSA, João (University of Tartu)

Session Classification: Wormholes, Energy Conditions and Time Machines

Track Classification: Alternative Theories: Wormholes, Energy Conditions and Time Machines