

Gravitational Geometry and Dynamics Group Seminar

Wed., March. 06th, 2024, at 11h00.

Room: 11.2.21 and Zoom ID: 989 6252 0928

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at: gravitation.web.ua.pt



Numerical evolution of well-posed field theories with anisotropic scaling

Dynamical equations exhibiting an anisotropic scaling between space and time admit a dispersive nature, as they contain higher-order spatial derivatives, but remain second order in time. This is the case of a class of Lorentz-violating theories of gravity, and this feature results inconvenient for performing long-time numerical evolutions with standard explicit schemes.

In this talk I will introduce a novel scheme which is implicit, stable and second-order accurate, for sufficiently large time steps. As a proof of concept, we will apply it for evolving the Lifshitz scalar field on top of a spherically symmetric black hole space-time.

Our results indicate that the dispersive terms produce a cascade of modes that accumulate in the region in between the Killing and universal horizons, indicating a possible instability of the latter.