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Membrane paradigm for slowly spinning compact objects

Searches for exotic compact objects (ECOs) from gravitational wave data require a thorough understanding of their signatures during the inspiral and the ringdown. ECOs are motivated by quantum gravity extensions of general relativity and are characterized by the absence of a horizon and partial reflectivity. In the ringdown, which can serve as a fingerprint of an ECO, it is essential to incorporate the effect of spin in post-merger remnants.

The membrane paradigm is a useful framework to model generic compact objects and study the relationship between different observables, such as the reflectivity and the quasi-normal modes (QNMs). The membrane paradigm was used to model black holes and non-spinning ECOs. In this talk, I will describe our extension of the membrane paradigm to slowly spinning compact objects and the derivation of their reflectivity and characteristic QNMs. Finally, I will discuss the implications of these results regarding the stability of spinning horizonless objects.

Email

msaketh@aei.mpg.de

Affiliation

Max Planck institute for gravitational physics, Potsam, Germany

Authors: SAKETH, M. V. S. (Max Planck institute for gravitational physics, Potsdam (Albert Einstein Institute)); Dr MAGGIO, Elisa (Max Planck institute for gravitational physics, Potsdam (Albert Einstein Institute))

Presenter: SAKETH, M. V. S. (Max Planck institute for gravitational physics, Potsdam (Albert Einstein Institute))

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