Black Holes, Neutron Stars, and Gravitational Waves @ Black Sea



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Gravitational Perturbations of Noncommutative Kerr Black Holes

We investigate gravitational perturbations of a rotating (Kerr) black hole within a noncommutative geometry framework for quantum gravity. Using a Drinfeld twist that deforms the spacetime symmetries (a semi-Killing twist), we formulate a noncommutative extension of Einstein field equations and derive the effective potential for axial (odd-parity) gravitational perturbations of a noncommutative Kerr black hole. Our analysis assumes a slow-rotation approximation and treats the noncommutativity parameter perturbatively, extending earlier noncommutative Schwarzschild (2409.01402) results to the Kerr case. We then compute the quasinormal mode spectrum of the deformed Kerr black hole.

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