

Electromagnetic-gravitational perturbations of Kerr-Newman black hole

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The Kerr-Newman spacetime is the most general explicit black hole solution, and represents a stationary rotating charged black hole. Its stability to electromagnetic-gravitational perturbations has eluded a proof since the 80s in the black hole perturbation community, because of "the apparent indissolubility of the coupling between the spin-1 and spin-2 fields in the perturbed spacetime", as put by Chandrasekhar. We will present a derivation of the Teukolsky and Regge-Wheeler equations governing the perturbations of Kerr-Newman in physical space, and use it to obtain a quantitative proof of stability.