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Quasi-normal Modes of near-extremal black holes in Generalized spherically symmetric spacetime and Strong Cosmic Censorship Conjecture

A number of near-extremal conditions are utilized to simplify the equation of motion of the neutral scalar perturbations in generalized spherically symmetric black hole background into a differential equation with the Pöschl-Teller potential. An analytic formula for quasinormal frequencies is obtained. The analytic formula is then used to investigate Strong Cosmic Censorship conjectures (SCC) of the generalized black hole spacetime for the smooth initial data. The Christodoulou version of the SCC is found to be violated for certain regions of the black hole parameter space including the black holes in General Relativity while the C¹ version of the SCC is always valid.

Authors: WUTHICHARN, Taum (Chulalongkorn University); BURIKHAM, Piyabut; PONGLERTSAKUL, Supakchai

Presenter: WUTHICHARN, Taum (Chulalongkorn University)

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