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Testing black hole with electromagnetic perturbations

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It is a well-known fact that light rays do not follow the null geodesics of spacetime, instead, they propagates along the null geodesics of the effective spacetime. In my presentation, we discuss the construction of the effective spacetime by studying the electromagnetic perturbations of black holes in general relativity coupled with nonlinear electrodynamics. Additionally, we explore the possibilities of distinguishing between the types of charge (electric or magnetic) of black holes by studying the motion of photons around generic black holes within the framework of general relativity coupled with nonlinear electrodynamics. Furthermore, we demonstrate the effectiveness of electromagnetic perturbations in testing the accuracy of black hole solutions in general relativity coupled with nonlinear electrodynamics.

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