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Some observational aspects of black holes in degenerate Einstein Gauss-Bonnet gravity

In this study, we analyse the quasinormal modes of black holes occurring within the framework of degenerate gravity. We investigate the properties of the asymptotically flat spacetimes introduced recently in [JCAP 02(2022)02] which are solutions to the degenerate Einstein Gauss-Bonnet(dEGB) action and belong to a much larger class of solutions which include cosmological constant. These solutions can be classified into two distinct branches akin to Einstein Gauss-Bonnet(EBG) gravity. However, unlike the EBG solutions, both the branches of dEGB are well-defined asymptotically. The negative branches from both theories can be identified for the asymptotically flat case. We observe black holes for specific ranges of the Gauss-Bonnet coupling parameter and perform a stability analysis by calculating the quasinormal modes (QNMs) under scalar wave propagation. Finally, the ringdown spectrums of our black holes are compared with their GR counterparts.

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