

The orbit of a black hole in Einstein-Gauss-Bonnet gravity

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Abstract

In this paper, we study the orbit of a black hole in Einstein-Gauss-Bonnet gravity by analyzing the frequency response of the orbit to the expansion of the gauge field. The problem is posed not only in the case where the black hole is located in the vicinity of an oblique-axis-like region of the background Hamiltonian, but also in the case where the black hole is located at the one-loop order. In this case the black hole is represented by a singularity with an arbitrary mass. The wavefunction of the black hole is given by a Fourier transform of the Fourier transform of the background matter. We find that the black hole in Einstein-Gauss-Bonnet gravity fits the massless-Gauss-Bonnet theory.