Sixteenth Marcel Grossmann Meeting



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Quasinormal modes in the field of a dyon-like dilatonic black hole

Tuesday, 6 July 2021 11:00 (20 minutes)

Quasinormal modes of massless test scalar field in the background of gravitational field for a non-extremal dilatonic dyonic black hole are explored. The dyon-like black hole solution is considered in the gravitational 4d model involving two scalar fields and two 2-forms. It is governed by two 2-dimensional dilatonic coupling vectors $\vec{\lambda}_i$ obeying $\vec{\lambda}_i(\vec{\lambda}_1 + \vec{\lambda}_2) > 0$, i = 1, 2. The first law of black hole thermodynamics is given and the Smarr relation is verified. Quasinormal modes for a massless scalar (test) field in the eikonal approximation are obtained and analysed. These modes depend upon a dimensionless parameter a ($0 < a \leq 2$) which is a function of $\vec{\lambda}_i$. For limiting strong (a = +0) and weak (a = 2) coupling cases, they coincide with the well-known results for the Schwarzschild and Reissner-Nordstr\"om solutions. It is shown that the Hod conjecture, connecting the damping rate and the Hawking temperature, is satisfied for $0 < a \leq 1$ and all allowed values of parameters.

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