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Hawking radiation of non-standard black holes

Black Holes of primordial origin (PBHs) can constitute a large fraction of dark matter (DM) in the Universe. If light enough, they can emit a sizeable amount of Hawking radiation, which may be detected by dark matter experiments and be used to set constraints on the fraction of PBHs as DM components. Lately, these constraints have been extended to spinning PBHs, and it is very important to extend such analyses to other black hole metrics, in particular in the perspective of a signal detection. Recent work on black solutions to the Einstein equations have resulted in metrics that are regular at the black hole center, solving the singularity problem. We will present a generalization of the existing formalism to the generic class of spherically symmetric and static black holes, determining the short-range potentials for the Teukolsky equations for these metrics. Using the public code BlackHawk, we will show how the Hawking radiation is modified for such black holes, and we will in particular focus on the case of polymerized black holes, which are black hole solutions arising from loop quantum gravity.

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Collaboration / Activity

Theory

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