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# The light burden of memory: constraining primordial black holes with high-energy neutrinos

Primordial Black Holes with a mass lighter than $10^{15}$g are expected to have evaporated by now according to Hawking's semi-classical approximation for black holes evaporation. Recent works have pointed out that quantum effects, known as "memory burden", may slow the evaporation of black holes, potentially allowing a population of light primordial black holes (PBHs) to survive until today and contribute to the dark matter energy density. We investigate PBHs with masses $M_{\rm PBH} \leq 10^9$ g that are currently evaporating and emitting high-energy particles, including neutrinos, in the local Universe. Using recent IceCube data, we place new constraints on the parameter space of PBHs and the memory burden effect. Additionally, we explore the sensitivity of future neutrino observatories such as IceCube-Gen2 and GRAND. Our results highlight the critical role of neutrino observations in probing scenarios with suppressed evaporation and light PBH masses.

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