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Gravitational wave constraints on burdened primordial black holes

We investigate the implications of memory burden on the gravitational wave (GW) spectrum arising from the Hawking evaporation of light primordial black holes (PBHs). By considering both rotating (Kerr) and non-rotating (Schwarzschild) PBHs, we demonstrate that the overproduction of primordial GWs from burdened PBHs could impose stringent constraints on the parameters governing backreaction effects. These constraints, derived from Δ Neff measurements by Planck and prospective experiments such as CMB-S4 and CMB-HD, offer novel insights into the impact of memory burden on PBH dynamics.

Field of contribution

Phenomenology

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