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No scalar-induced GW signal from PBH evaporation

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We discuss the scalar-induced-gravitational-wave (SIGW) signal from primordial black hole (PBH) evaporation. In the monochromatic scenario, a significant signal is generated by the poltergeist mechanism as a result of a sudden transition from matter to radiation dominance. Non-trivial mass distributions affect this mechanism by prolonging the transition period. We show that for realistic mass distributions, commonly assumed from superhorizon formation, no signal can be expected in any part of the PBH parameter space in any of the upcoming GW experiments. We pay particular attention to the validity of the linearity of the perturbation theory, the cutoff of the curvature power spectrum due to diffusion damping, and curvature sources from adiabatic and isocurvature initial conditions.

Primary authors: LEISTER, Nicholas (Johannes Gutenberg-Universität Mainz); SCHWALLER, Pedro; GOUT-TENOIRE, Yann

Presenter: LEISTER, Nicholas (Johannes Gutenberg-Universität Mainz)

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