

Stochastic Gravitational Waves from Primordial Black Hole in Dwarf Galaxies

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Content

We investigate the Stochastic Gravitational Wave Background (SGWB) generated by Close Hyperbolic Encounters (CHEs) of Primordial Black Holes (PBHs) within dark matter dominated dwarf galaxies. Building upon our previous work, this study incorporates the full hierarchical merger history of PBHs to evaluate their cumulative contribution to the SGWB. Our framework identifies the conditions under which gravitational waves from CHEs and successive PBH mergers become significant components of the observable SGWB, and allows for a direct comparison with signals from standard PBH mergers. We determine the parameter space in which these signals may be detected by next-generation gravitational wave observatories, including the Einstein Telescope, LISA, Pulsar Timing Arrays (PTAs), and the Square Kilometre Array (SKA). Furthermore, we present numerical criteria that define the validity range of our analytical models. The code used in this analysis is publicly available at HierarchicalCHEs.

Dedicated to Elizabeth América Flores-Frías.

Tipo de presentación

Oral

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