

Searching Stochastic Gravitational Wave Background Landscape From Inflated String-Wall Network Across Frequency Bands

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Gravitational wave (GW) astrophysics is entering a multi-band era with upcoming GW detectors, enabling detailed mapping of the stochastic GW background across vast frequencies. We highlight this potential via a new physics scenario: hybrid topological defects from a two-step phase transition separated by inflation. We develop a general pipeline to analyze experimental exclusions and apply it to this model. The model offers a possible explanation of the NANOGrav signal at low frequencies, and future experiments (LISA/Cosmic Explorer/Einstein Telescope) will confirm or rule it out via the higher-frequency probes, showcasing the power of multi-band constraints.

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