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Hubble-Induced Phase Transitions: Gravitational-Wave Imprint of Ricci Reheating from Lattice Simulations

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Abstract

Gravitational waves offer an unprecedented opportunity to look into the violent high-energy processes happening during the reheating phase of our Universe. We consider a Hubble-induced phase transition scenario as a source of a post-inflationary stochastic background of gravitational waves and analyse the main characteristics of its spectrum for the first time via numerical methods. The output of a large number of fully-fledged classical lattice simulations is condensed in a set of parametric formulas that describe key features of the GW spectrum, such as its peak amplitude and characteristic frequency, and avoid the need for further time-consuming simulations. The signal from such stochastic background is compared to the prospective sensitivity of future gravitational-wave detectors.

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