Contribution ID : **63** Type : **not specified**

Scalar-Induced Gravitational Waves: Beyond the Lattice

Content

We study a model in which scalar fields generate gravitational waves through 4-point correlation functions, originating from the scalar power spectrum. The resulting gravitational wave spectrum depends on the couplings of the scalar fields and is predominantly blue-tilted, which automatically satisfies the constraints on CMB scales.

The novelty of our approach lies in computing the gravitational spectrum on super-horizon scales. This regime is particularly interesting, since classical lattice simulations are restricted to sub-horizon scales and, as we show, the super-horizon spectrum is closer to the sensitivity ranges of current and future gravitational wave experiments.

Summary

This contribution discusses the production of scalar-induced gravitational waves from spectator-field perturbations in the early Universe, focusing on super-horizon modes and regimes beyond the reach of classical lattice simulations.

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