

A flashing beacon in axion inflation: recurring bursts of gravitational waves in the strong backreaction regime

Tuesday, 13 June 2023 14:20 (20 minutes)

The coupling between a pseudo-scalar inflaton and a gauge field leads to an amount of additional density perturbations and gravitational waves (GWs) that is strongly sensitive to the inflaton speed. This naturally results in enhanced GWs at (relatively) small scales that exited the horizon well after the CMB ones, and that can be probed by a variety of GW observatories (from pulsar timing arrays, to astrometry, to space-borne and ground-based interferometers). This production occurs in a regime in which the gauge field significantly backreacts on the inflaton motion. Contrary to earlier assumptions, it has been recently shown that this regime is characterized by an oscillatory behavior of the inflaton speed, with a period of $\sim \mathcal{O}(5)$ e-folds. Bursts of GWs are produced at the maxima of the speed, imprinting nearly periodic bumps in the frequency-dependent spectrum of GWs produced during inflation. This can potentially generate correlated peaks appearing in the same or in different GWs experiments.

Secondary category for the parallel session (optional)

Gravitational Waves

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Session Classification: Parallel: Cosmology 2

Track Classification: Parallel Sessions: Cosmology