

Scalar perturbations from inflationary magnetogenesis

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Primordial non-Gaussianities, though yet unobserved, remain an important observable since they can help differentiate various models of inflation. This necessitates a deep understanding of the various processes that could contribute to these non-Gaussianities, with inflationary magnetogenesis being one of them. Often, the spectrum and the bispectrum of the perturbations produced during inflation are studied under the assumption that the metric perturbations can be neglected and that all the relevant physics resides in the coupling of the inflaton and the gauge fields. Here, we present a full set of equations self-consistently accounting for the perturbations of the inflaton and the gauge field along with the scalar perturbations of the metric. In this talk, I will specifically consider the case of axion inflation with purely axial coupling of the inflation to the gauge fields. I will compare the scalar power spectrum and bispectrum derived from our equations to those reported in earlier literature. In particular, by comparing the amplitude of the scalar bispectrum with modern observational constraints for primordial non-Gaussianity, I will reconcile the existing constraints for the axion-vector coupling during inflation.

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