



Contribution ID: 59

Type: not specified

Signatures of complex scalar field with chemical potential in primordial non-gaussianities

Non-gaussianity in the primordial fluctuations is a promising sign of new physics beyond minimal inflationary models and is a probe into physics at energies as high as inflationary Hubble scale. Massive particles, through their coupling with inflaton field, can leave characteristic signatures in primordial non-gaussianities containing information about their mass and spin. The signal generally gets rapidly suppressed for masses greater than Hubble scale due to a Boltzman-like suppression factor $\sim e^{-\pi M/H}$. This constrains the regime of observable new physics. In this work, we consider a model of a complex scalar coupled to the inflaton field via a chemical potential like term. We show that the addition of this term has an effect of overcoming the Boltzman-like suppression by boosting particle production during inflation. We also evaluate the trispectrum to show a considerable enhancement in the magnitude of non-gaussianities in primordial fluctuations.

Primary authors: BODAS, Arushi (University of Maryland-College Park); KUMAR, Soubhik (University of Maryland); SUNDRUM, Raman (University of Maryland)

Presenter: BODAS, Arushi (University of Maryland-College Park)