



Contribution ID: 157

Type: **not specified**

Effect of Trans-Planckian Environment on Primordial Spectra and Non-Gaussianity

Tuesday, 12 September 2023 17:10 (20 minutes)

We investigate the impact of stochastic quantum noise due to trans-Planckian effects on the primordial power spectrum for gravity waves during inflation. Given an energy scale Λ , expected to be close to the Planck scale m_{Pl} and larger than the Hubble scale H , this noise is described in terms of a source term in the evolution equation for comoving modes k which changes its amplitude growth from early times as long as the mode physical wavelength is smaller than Λ^{-1} . We model the source term as due to a gas of black holes in the trans-Planckian regime and the corresponding Hawking radiation. In fact, for energy scales larger than, or of the order of Λ , it is expected that trapped surfaces may form due to large energy densities. At later times the evolution then follows the standard sourceless evolution. We find that this mechanism still leads to a scale-invariant power spectrum of tensor perturbations, with an amplitude that depends upon the ratio Λ/m_{Pl} . This result is compatible with recent observations and can allow the slow-roll parameter space to scan a new range of values. Finally, we also discuss, for a more general model, the forecast on the primordial tensor non-gaussianity in the presence of stochastic sources.

Primary authors: Prof. MANGANO, Gianpiero (Università di Napoli Federico II & INFN Sezione di Napoli); Dr FASIELLO, Matteo (IFT - Madrid); CIELO, Mattia (Istituto Nazionale di Fisica Nucleare); Prof. PISANTI, Ofelia (Università di Napoli Federico II & INFN Sezione di Napoli)

Presenter: CIELO, Mattia (Istituto Nazionale di Fisica Nucleare)

Session Classification: COS: Cosmology

Track Classification: Cosmology