Contribution ID: **28** Type: **not specified**

Shuntaro Aoki "Inflationary Correlators with Dynamical Mass,"

Thursday, 9 November 2023 15:10 (25 minutes)

Massive fields can leave an imprint on primordial correlation functions or inflationary correlators with specific oscillatory features, which is dubbed the cosmological collider sig- nal. In this work, we analytically investigate effects of a time-dependent mass of a scalar field on inflationary correlators, extending previous numerical studies and implementing techniques developed in the cosmological bootstrap program. The time-dependent mass is in general induced by couplings to the slow-roll inflaton background and gives sizable effects especially in the case with non-derivative couplings. Approximating the time- dependence at the linear order, we obtain an analytic expression for mode functions of the massive scalar, based on which we derive analytic formulae for two-, three-, and four-point correlators with the tree-level exchange of the massive scalar. The obtained formulae are used to discuss phenomenological impacts on the power spectrum and bispectrum. In particular, we find that the scaling behavior of the bispectrum in the squeezed configu- ration, i.e., the cosmological collider signal, is modified by a time-dependent Bolzmann suppression and couplings between inflaton and the massive particle can be distinguished in principle by investigating the scaling behavior in detail.

Session Classification: Short talks