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Joint power spectrum-bispectrum covariance and the squeezed configurations

Thursday, June 30, 2022 11:00 AM (1 hour)

Predictions from single-field inflation are consistent with CMB observations. Large-scale structure observations will improve our knowledge of the early universe. In particular, we can learn much about the inflationary era by testing for primordial non-Gaussianity (PNG). The upcoming galaxy surveys promise to improve such constraints by mapping the 3-dimensional distribution of matter and galaxies in the universe to scales of the order of the Hubble horizon. Then, to extract infor- mation about the early universe, we need to compute observables with the same precision as the observations, for example, the galaxy Power Spectrum and Bispectrum. A precise estimation for the covariance is a relevant ingredient in determining the information content of a given observable. The main goal of the talk is to study how the modelling of the joint power spectrum-bispectrum covariance is improved by including non-Gaussian terms that agree with N-body simulations at a 20% level. We will see that the non-Gaussian terms in the covariance are significant for observables evaluated at the squeezed limit, as in the case of the local PNG factor. Then, by doing a Fisher analysis on the constraining power of PNG, it is confirmed that non-Gaussian terms have to be taken into account, as they degrade the constraint by more than a factor of 2. Finally, I will talk about a work in progress where we want to include shot noise contribution and use the theoreti- cal covariance to estimate the uncertainty in measuring PNG from the power spectrum response function.

Presenter: CASTIBLANCO, Lina