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The Quijote PNG simulations - A test bed for higher order statistics and primordial non-Gaussianity

Friday, July 1, 2022 9:00 AM (1 hour)

Constraints on primordial non-Gaussianity (PNG) provide powerful insights into the early universe. To date, the CMB has been the leading source of information and I will briefly overview what more we expect to gain from upcoming experiments. Large scale structure measurements potentially have a wealth of information that could surpass the CMB. However, due to the non-linear nature of structure formation, fully accessing this is challenging. To help address this issue, my collaborators and I present the Quijote-PNG simulations. This is a suite of large scale structure simulations which contain three types of primordial non-Gaussianity. These simulations are designed to complement the existing Quijote simulations, which varied the Λ CDM cosmological parameters, and are a useful test bed for developing new PNG estimators. We present an example of their utility by exploring the information content in measurements of the bispectrum on non-linear scales. As a bonus I will also discuss a new method for improving the estimation of the Fisher information, when you only have access to simulations. This new method provides a test of the stability of numerical Fisher estimates and can also dramatically reduce the number of simulations required to have robust results.

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