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Higher moments of primordial non-Gaussianity and constraints from X-ray clusters SAROJ ADHIKARI, SARAH SHANDERA, Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA, USA, NEAL DALAL, Department of Astronomy, University of Illinois, 1002 W. Green St., Urbana, IL, USA — We perform cosmological N-body simulations of dark matter structure formation using non-Gaussian initial conditions, with two different scaling of higher order moments (skewness, kurtosis etc). The scalings determine the relative strength of the total non-Gaussianity for a given value of skewness. We show that a current analytic prescription to compute the non-Gaussian mass function (number density of dark matter halos as a function of the halo mass) can describe the simulation results, after some calibration, in a useful parameter space when the strength of non-Gaussianity is small. We use our simulation results to produce semi-analytic fitting functions for the non-Gaussian mass function relative to the Gaussian mass function. These mass function results have already been used to generate constraints on the primordial non-Gaussianity parameter $f_{\rm NL}$ using X-ray cluster measurements. The constraints are consistent with Gaussian initial conditions, and demonstrate the potential of cluster mass function in constraining primordial non-Gaussianity.

Saroj Adhikari
Institute for Gravitation and the Cosmos,
The Pennsylvania State University,
University Park, PA, USA

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