PROCEEDINGS OF SCIENCE

Cosmological parameters from 2nd & 3rd order cosmic shear statistics

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Cosmic shear, the weak gravitational lensing effect caused by the large-scale structure of the matter in the Universe, is a powerful tool to study the matter distribution on very large scales. In the recent past, cosmic shear surveys have been carried out with great success, and interesting constraints on cosmological parameters have been inferred, in particular the matter density Ω_m and the power spectrum normalization σ_8. While until recently, mainly two-point functions of shear have been measured, the inclusion of higher-order statistics will allow one to detect non-Gaussian features in the matter distribution and to break degeneracies between cosmological parameters. In my talk, I show what combined second and third order statistics of cosmic shear can tell us about cosmology. Using ray-tracing simulations, I estimate the expected shear signal. With theoretical models of the power- and bi-spectrum of the large-scale matter fluctuations, I estimate the precision of determining various cosmological parameters and show the level of degeneracies between these parameters.

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