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**Predictions on Higher-Order Statistics with Weak Gravitational Lensing** SANAZ VAFAEI, UBC — Weak gravitational lensing by large-scale structure is now routinely measured at the two-points statistics level. When using the second order statistics only, weak gravitational lensing enables us to set cosmological constraints on the combination of the amplitude of the matter power spectrum and the matter density parameter. The existing degeneracy between the two parameters can be broken by third-order statistics measurements, namely the skewness statistic. Since this effect is weak, we must invest in an optimal survey design for the future surveys to detect and better measure the skewness. We demonstrate the power of including the third-order statistics in weak lensing analysis. We present the promising predictions for the measurement of the third-order statistics on the complete CFHTLS wide survey, based on an extensive set of cosmological ray-tracing lensing simulations with realistic noise estimates. We also investigate the type of survey that is optimal to detect the higher-order cosmic shear statistics.

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