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Exploring the Significance of Deflection Effects in DES Y3

Sunday, January 22, 2023 8:30 AM (12 minutes)

The goal of this project is to determine whether weak lensing deflection effects on galaxies is negligible, as is the current assumption, using data from the Dark Energy Survey's Year 3 results. We determine this by computationally measuring the three two-point correlation functions for galaxy clustering, galaxy-galaxy lensing, and cosmic shear in gravitationally deflected galaxy positions and comparing them to undeflected galaxy positions within a simulated galaxy catalog. If the effects of deflection are statistically significant, we must correct the assumption and refine our models. The concept of "Precision Cosmology" is relevant here because, although we are dealing with extremely small differences and numbers, these small numbers extrapolate to very large effects when looking back to the early Universe and its evolution over time. So small errors in our cosmological models would ultimately make our models of the Universe erroneous, which is particularly relevant as we move toward working with the more powerful Large Synoptic Survey Telescope and its data.

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Session Classification: Student Research Talks II