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Modeling non-linear galaxy bias in preparation for the LSST[1]
SAMUEL GOLDSTEIN, University of Pennsylvania, ANZE SLOSAR, Brookhaven National Lab, LSST: DARK ENERGY SCIENCE COLLABORATION COLLABORATION — The Large Synoptic Survey Telescope (LSST) will collect photometric data for billions of galaxies, allowing scientists to probe the structure of the universe at levels hitherto inaccessible. One goal of such efforts is to study the relationship between matter and galaxy distributions using power spectra: measures of scale dependent density field correlations in Fourier space. Various models exist to relate the galaxy and matter power spectra; however, at high wave numbers, modeling the non-linear power spectrum becomes difficult. The purpose of this project is to quantify the relationship between matter and galaxy distributions with a variety of models using the Dark Energy Science Collaboration (DESC) data challenge 2 (DC2) data set. Preliminary results using a single parameter bias term model indicate agreement between theory and observation up to $k_\perp \approx 0.1$ Mpc^{-1}. By applying more sophisticated models with multiple bias parameters we are able to effectively predict the galaxy auto and galaxy/matter cross power spectra up to $k_\perp \approx 0.5$ Mpc^{-1}. By constraining the maximum wave number at which we can accurately reconstruct the power spectrum from simulated data, we can better interpret the reliability of future power spectrum measurements

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