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Chandra Shekhar Saraf - Cross-Correlation Study between CMB Lensing and Galaxy Surveys

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Cosmic Microwave Background (CMB) is a powerful probe to study the early universe and various cosmological models. Weak gravitational lensing affects the CMB by changing its power spectrum, but meanwhile, it also carries information about the distribution of lensing mass and hence, the large scale structure (LSS) of the universe. When studies of the CMB is combined with the tracers of LSS, one can constrain cosmological models, models of LSS development and astrophysical parameters simultaneously. The main focus of this project is to study the cross-correlations between CMB lensing and the galaxy matter density to constrain the galaxy bias b and the amplitude scaling parameter A, to test the validity of ΛCDM model. We test our approach for simulations of the Planck CMB convergence field and galaxy density field, which mimics the density field of the Herschel-ATLAS (H-Atlas) galaxy survey. We use maximum likelihood method to constrain the parameters.

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