

Abstract Submitted
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CMB Lensing Tomography with the Dark Energy Survey Science Verification galaxies ROSS CAWTHON, Univ of Chicago, TOMMASO GIANNANTONIO, Univ of Cambridge, PABLO FOSALBA, Institut de Ciencies de l'Espai, FRANZ ELSNER, BORIS LEISTEDT, AURELIEN BENOIT-LEVY, DONNACHA KIRK, Univ College London, MARTIN CROCCE, Institut de Ciencies de l'Espai, SCOTT DODELSON, Univ of Chicago, GIL HOLDER, YUUKI OMORI, McGill Univ, DARK ENERGY SURVEY COLLABORATION, SOUTH POLE TELESCOPE COLLABORATION — We present a detection of the cross-correlation between galaxies in the Dark Energy Survey (DES) Science Verification data and the lensing of the CMB as reconstructed by the Planck satellite and the South Pole Telescope (SPT). When considering the DES main galaxy sample, the significance of the detection is at the level of > 5 and $> 2\sigma$ for SPT and Planck respectively. Given the high significance recovered for the SPT correlation, we perform for the first time a tomographic analysis of the redshift evolution of the CMB lensing signal, by dividing the DES galaxies in five photometric redshift bins. We find that the signal evolves in redshift as expected in the fiducial cosmology, recovering significant ($> 2\sigma$) detections in most bins. We further extend our analysis to a smaller Luminous Red Galaxy sample to test the correlation in the high-mass range, also finding a positive $\sim 3\sigma$ signal in agreement with the fiducial model. We perform an extended test of the possible systematics that could affect our result, finding no evidence for them. We finally demonstrate how these measurements can be used to constrain the growth of structure across cosmic time.

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