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Detection of gravitational lensing of the Cosmic Microwave Background polarization by the POLARBEAR experiment[1] ADRIAN LEE, University of California, Berkeley, POLARBEAR COLLABORATION — We report the direct detection of gravitational lensing of the Cosmic Microwave Background polarization. We present maps of 30 square degrees of the sky measured to a depth of 6 microK*arcminute at 150 GHz. To detect the non-Gaussian signature of gravitational lensing, we measure the 4-point correlation functions EEEB and EBEB where E and B describe E-mode and B-mode maps. We reject the null hypotheses at 4.2 sigma significance, including the contribution of systematic errors, using the combination of these two 4-point correlation functions. Further, we measure a lensing amplitude normalized to LCDM of 1.06 +/-0.47(stat) +0.32/-0.27(sys) consistent with the current standard cosmological model. This result gives a measurement of the amplitude of matter fluctuations in the Universe with 26% error. Measurements of gravitational lensing of the Cosmic Microwave Background have great potential as a probe of structure formation, the behavior of Dark Energy, and the sum of the masses of neutrinos through their role as hot Dark Matter.

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