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SPTpol Measurement of E and B-mode CMB Polarization TYLER NATOLI, Univ of Chicago, SPTPOL COLLABORATION — The South Pole Telescope Polarimeter (SPTpol) began observations of the cosmic microwave background (CMB) in February 2012. The instrument features dual polarization transition edge sensor bolometers in two bands, 588 pixels (1176 bolometers) at 150 GHz and 180 pixels (360 bolometers) at 95 GHz. During the first year of observations SPTpol covered a 100 square degree patch of sky, which led to the first detection of lensing B modes. This field has now been mapped in polarization to a depth of 9μK-arcmin at 150 GHz and 19μK-arcmin at 95 GHz. Measurements of CMB polarization anisotropy will provide cosmological information that cannot be obtained with temperature measurements alone. Measuring even parity modes, E modes, will lead to tighter parameter constraints and tests of the ΛCDM model. Measuring odd parity modes, B modes, will give us important information on two fronts. At small angular scales lensing B modes will provide powerful constraints on the sum of the neutrino masses, while at larger angular scales B modes produced by gravitational waves may confirm inflation and probe its energy scale. Here we will present the SPTpol E and B mode measurements and the cosmological implications.

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