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Cosmological Results from Sunyaev-Zel'dovich-selected Galaxy Clusters in the 2500-square-degree SPT-SZ Survey LINDSEY BLEEM, University of Chicago, SOUTH POLE TELESCOPE COLLABORATION — The South Pole Telescope (SPT) is a 10-meter millimeter-wavelength telescope located at the geographic South Pole. In Fall 2011 the SPT completed a three band (90, 150, 220 GHz) survey of 2500 deg² of the southern sky. One of the primary objectives of this survey was the compilation of a nearly mass-limited sample of galaxy clusters selected via the Sunyaev-Zel'dovich (SZ) Effect. The final sample consists of ~ 550 galaxy clusters ($> 85\%$ new discoveries) with a median mass of $3 \times 10^{14} M_{\text{solar}}/h$, a median redshift of 0.55, and a maximum spectroscopic redshift to date of 1.47. I will highlight recent cosmological results derived from the cluster sample and discuss on-going efforts to improve the calibration of the mass-SZ observable relation. With improved mass calibration, the full SPT-SZ cluster sample will constrain the dark energy equation of state parameter, w , with a precision of $\sigma_w = 0.05$ when combined with WMAP and $\sigma_w = 0.075$ with galaxy clusters alone. These projected cluster-only constraints are comparable to the best current constraints from geometric measurements of the Universe, and, by measuring the effect of dark energy on the growth of structure, serve as an independent test of the standard dark energy model.

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