

Contributed Talk

SPTpol: A CMB Polarization Anisotropy Machine

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In early 2012, the 10 m South Pole Telescope (SPT) was equipped with a polarization-sensitive camera, SPTpol, to measure the polarization anisotropies of the cosmic microwave background (CMB). SPTpol is a mm-wave bolometric camera consisting of 180 polarimeters at 90 GHz and 588 polarimeters at 150 GHz. The full set of 150 GHz detectors consists of 7 arrays of 84 ortho-mode transducers coupled, each of which is coupled via striplines to two transition edge sensor (TES) bolometers. Each 90 GHz polarimeter consists of two orthogonal antenna-coupled absorbers each coupled to a TES. The 1536 TES bolometers are read out with a digital frequency-domain multiplexing system. We are currently in the second year of observation. For the full four year survey, our projected constraint on the sum of neutrino masses at $\sigma(m_\nu) = 0.096$ eV and the tensor-to-scalar ratio $\sigma(r) = 0.028$. The patch of sky observed already overlaps with fields measured by the near infrared and far infrared/submm Spitzer-IRAC and Herschel-SPIRE instruments and will soon be studied by the Dark Energy Survey collaboration with the optical DECam. The combination of data will allow for detailed study of galaxy and cluster formation at high redshift.