

Poster

**Horn Coupled Multichroic Polarimeters for Measurement of the CMB**

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Measurements of the faint polarized signals from the Cosmic Microwave Background (CMB) provide unique opportunities to measure diverse physics including: inflation, dark energy, and the sum of the neutrino masses. These measurements require both exquisite sensitivity and tight control over systematic effects including foregrounds. We present the status of horn coupled multichroic polarimeters optimized to meet these demands. The present generation of these detectors achieves 2.3:1 ratio bandwidth and stringent control of beam and detector polarization angle systematics using ring loaded corrugated feed horns and a broad band planar ortho-mode transducer. These components couple incoming light onto microstrip lines where resonant diplexers separate the signals into frequency bands that are routed to TES bolometers for detection. We have tested detectors incorporating the 90 and 150 GHz CMB bands and are developing a 255 horn (1020 bolometer) array that we plan to deploy in the ACTPol receiver at the end of the year. These detectors will be scaled to lower and higher frequency to characterize synchrotron and dust foregrounds and we are exploring design modifications that achieve ratio bandwidths  $>3.3:1$  with improved coupling efficiency. We present the design and performance of the current generation of horn coupled multichroic polarimeters and provide an overview of our plans for future development.