

Beam-Related Systematic Error Suppression for the PIXIE Polarizing Fourier Transform Spectrometer

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The double differential nature of PIXIE's four-port measurement mitigates beam-related systematic errors common to the two-port systems used in most CMB measurements. Systematic errors coupling unpolarized temperature gradients to a false polarized signal cancel to first order for any individual detector. This common-mode cancellation is performed optically, prior to detection, and does not depend on the instrument calibration. Systematic errors coupling temperature to polarization cancel to second order when comparing signals from independent detectors. We describe the polarized beam patterns for PIXIE and assess the systematic error for measurements of CMB polarization.

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