

Abstract Submitted
for the APR11 Meeting of
The American Physical Society

Design and Calibration of the QUIET CMB Polarimeter IM-MANUEL BUDER, University of Chicago, QUIET COLLABORATION — QUIET is a large-angular-scale Cosmic Microwave Background (CMB) polarimeter designed to measure the B-mode signal from inflation. The design incorporates a new time-stream “double-demodulation” technique, a 1.4-m Mizuguchi–Dragone telescope, natural sky rotation, and frequent boresight rotation to minimize systematic contamination. The levels of contamination in the inflationary signal are below $r = 0.1$, the best yet achieved by any B-mode polarimeter. Moreover, QUIET is unique among B-mode polarimeters in using a large focal-plane array of miniaturized High–Electron-Mobility Transistor (HEMT) based coherent detectors. These detectors take advantage of a breakthrough in microwave-circuit packaging to achieve a field sensitivity of $69 \mu\text{K}\sqrt{\text{s}}$. QUIET has collected $> 10,000$ hours of data and recently released results from the first observing season at Q band (43 GHz). Analysis of W-band (95-GHz) data is ongoing. I will describe the Q-band calibration plan which uses a combination of astronomical and artificial sources to convert the raw data into polarization measurements with small and well-understood calibration errors. I will also give a status report on calibration for the upcoming W-band results.

Immanuel Buder
University of Chicago

Date submitted: 13 Jan 2011

Electronic form version 1.4