

Laboratory Characterization of the Q & U Bolometric Interferometer for Cosmology (QUBIC)

Tuesday, 1 December 2020 18:35 (25 minutes)

A prototype version of the Q & U Bolometric Interferometer for Cosmology (QUBIC) underwent a campaign of testing in the laboratory at Astroparticle Physics and Cosmology in Paris. Characterization of QUBIC includes the measurement of the synthesized beam, the measurement of interference fringes, and the measurement of polarization performance. A modulated and frequency tunable millimetre-wave source in the telescope far-field is used to simulate a point source. The QUBIC pointing is scanned across the point source to produce beam maps. Polarization modulation is measured using a rotating Half Wave Plate. The measured beam matches well to the theoretical simulations and gives QUBIC the ability to do spectro imaging. The polarization performance is excellent with less than 0.5% cross-polarization rejection. QUBIC has demonstrated the feasibility of Bolometric Interferometry, and verified the applicability of the key advantages to such a system including the minimization of systematic effects using self-calibration, and the possibility to do spectroimaging. This presentation is based on the paper <https://arxiv.org/abs/2008.10056>

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Session Classification: 5. methods: instrumentation 1