# Abstracts

## A dual-polarized quasi-optical SIS mixer at 550 GHz

*G. Chattopadhyay, D. Miller, H.G. LeDuc and J. Zmuidzinas. "A dual-polarized quasi-optical SIS mixer at 550 GHz." 2000 Transactions on Microwave Theory and Techniques 48.10 (Oct. 2000 [T-MTT]): 1680-1686.*

In this paper, we describe the design, fabrication, and the performance of a low-noise dual-polarized quasi-optical superconductor-insulator-superconductor (SIS) mixer at 550 GHz. The mixer utilizes a novel cross-slot antenna on a hyperhemispherical substrate lens, two junction tuning circuits, niobium trilayer junctions, and an IF circuit containing a lumped element 180/spl deg/ hybrid. The antenna consists of an orthogonal pair of twin-slot antennas, and has four feed points, two for each polarization. Each feed point is coupled to a two-junction SIS mixer. The 180/spl deg/ IF hybrid is implemented using a lumped element/microstrip circuit located inside the mixer block. Fourier transform spectrometer measurements of the mixer frequency response show good agreement with computer simulations. The measured co-polarized and cross-polarized patterns for both polarizations also agree with the theoretical predictions. The noise performance of the dual-polarized mixer is excellent giving uncorrected receiver noise temperature of better than 115 K (double sideband) at 528 GHz for both the polarizations.

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