Abstracts

A 530-GHz balanced mixer

G. Chattopadhyay, F. Rice, D. Miller, H.G. LeDuc and J. Zmuidzinas. "A 530-GHz balanced mixer." 1999 Microwave and Guided Wave Letters 9.11 (Nov. 1999 [MGWL]): 467-469.

We report on the design and performance of a 530-GHz balanced SIS mixer, the first balanced mixer in this frequency range. This quasi-optical balanced mixer utilizes a cross-slot antenna on a hyperhemispherical substrate lens with eight superconductor-insulator-superconductor (SIS) junctions and a 180/spl deg/ lumped element IF hybrid circuit. The local oscillator (LO) and the radio frequency (RF) signal, orthogonal in polarization to each other, are coupled to the mixer using a wire-grid polarizer. The noise performance of the mixer is excellent, giving an uncorrected receiver noise temperature of 105 K (DSB) at 528 GHz.

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