

329. Title:Twin-Slot Antenna Coupled NbN Hot Electron Bolometer Mixer at 2.5 THz

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Abstract:We demonstrate a quasi-optical NbN hot electron bolometer (HEB) mixer using a twin-slot antenna on a Si lens to couple terahertz radiation. The mixer shows a receiver noise temperature of 1150 K at 2.5 THz, which is expected based on a model that includes quantum noise. The measured direct response is understood by taking into account the main beam efficiency and the parasitic reactance due to the geometric change between bolometer and transmission line. The measured beam of the mixer is nearly collimated and has a Gaussian beam efficiency of 90% with side-lobes below -16 dB.