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Title

A Technology Demonstrator for 1.6-2.0 THz Waveguide HEB Receiver with a Novel Mixer Layout

Source

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Abstract

In this paper, we present our studies on a technology demonstrator for a balanced waveguide hot-electron bolometer (HEB) mixer operating in the 1.6-2.0 THz band. The design employs a novel layout for the HEB mixer combining several key technologies: all-metal THz waveguide micromachining, ultra-thin NbN film deposition and a micromachining of a silicon-on-insulator (SOI) substrate to manufacture the HEB mixer. In this paper, we present a novel mixer layout that greatly facilitates handling and mounting of the mixer chip via self-aligning as well as provides easy electrical interfacing. In our opinion, this opens up a real prospective for building multi-pixel waveguide THz receivers. Such receivers could be of interest for SOFIA, possible follow up of the Herschel HIFI, and even for ground based telescopes yet over limited periods of time with extremely dry weather (PWV less than 0.1 mm). (37 References).