

Terahertz heterodyne array based on NbN HEB mixers.

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A 16 pixel heterodyne receiver for 2.5 THz is been developed based on NbN superconducting hot-electron bolometer (HEB) mixers. The receiver uses a quasioptical RF coupling approach where HEB mixers are integrated into double dipole antennas on 1.5 μm thick Si₃N₄/ SiO₂ membranes. Miniature mirrors (one per pixel) and back short for the antenna were used to design the output mixer beam profile. The camera design allows all 16 pixel IF readout in parallel. The gain bandwidth of the HEB mixers on Si₃N₄/ SiO₂ membranes was found to be about 3 GHz, when an MgO buffer layers is applied on the membrane. We will also present the progress in the camera heterodyne tests.

Keywords: HEB mixer, terahertz camera, NbN films, membrane, bolometer.

