2.5THz multipixel heterodyne receiver based on NbN HEB mixers

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ABSTRACT

A 16 pixel heterodyne receiver for 2.5 THz has 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 1.5μm thick Si_3N_4/ SiO_2 membranes. Spherical mirrors (one per pixel) and backshort distance from the antenna have been used to design the output mixer beam profile. The camera design allows all 16 pixel IF readout in parallel. Measurements of the mixers sensitivity and the input RF band are presented, and compared against calculations.