CHARACTERIZATION OF A HEB DETECTOR FOR THz RADIATION

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We have begun to characterize the response of an antenna coupled niobium hot electron bolometer (HEB) at 4.2K. Specifically, the responsivity was measured to be 1 x $10^4$ V/W at 4.2 K. Such technology couples the excellent responsivity of thermal bolometers with $< 10$ nanosecond response times and with the ability to function while observing a room temperature background without becoming saturated. The detector is both faster and more sensitive than any known commercially available detector. We plan to use the devices as both direct detectors for THz radiation as well as heterodyne front ends for our proposed Fourier Transform THz Spectrometer. This research is motivated by the impending data from Herschel and SOFIA and the lack of laboratory spectra for many of the complex molecules that are expected to have intense torsional modes in the THz region of the spectrum.