Suspended Tunnel Junction Bolometers for THz Imaging

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Implementation of high resolution passive THz cameras operated at cryogenic temperatures of a few Kelvin benefits from large number of pixels. At present, building a cryogenic multiplexed read-out circuit represents a challenging task. Here we propose and demonstrate broadband niobium-based tunnel junction bolometers operating in equilibrium regime at 4 K to meet the requirements for a single pixel in a multiplexed array read out with a room temperature amplifier. We present electrical and preliminary optical measurements of the detectors. We propose that they are potentially more practical for multiplexing in contrast to the hot-spot bolometers where two-stage thermal circuits are suggested to overcome the issue of limited power gain bandwidth.