# Fast room temperature THz microbolometers.

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***Abstract*—We will present experimental and theoretical investigation of room temperature high speed THz detectors based on thin $YBa_2Cu_3O_7$ films. These films have TCR of 0.35%/K, and can sustain large bias current densities. With a resistivity of 100-200 μΩ×cm for a film thickness of 50nm, it is very straightforward to impedance match such bolometers with planar antennas. The responsivity is a function of the bolometer planar dimensions and the films thickness. The currently achieved responsivity is 30V/W and Johnson noise limited NEP is 70pW/Hz$^{0.5}$. The bolometer bandwidth is limited by the antenna bandwidth and spans from microwaves to over a few THz. Experimenatl investigation is done from 100GHz to 2.5THz. The measured response time is 2ns. We will also present results of the bolometer performance as their dimensions reduce to sub-μm.**