484. Title:Bolometric and nonbolometric radio frequency detection in a metallic single-walled carbon nanotube

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Abstract:We characterize radio frequency detection in a high-quality metallic single-walled carbon nanotube. At a bath temperature of 77 K, only bolometric (thermal) detection is seen. At a bath temperature of 4.2 K and low bias current, the response is due instead to the electrical nonlinearity of the non-Ohmic contacts. At higher bias currents, the contacts recover Ohmic behavior and the observed response agrees well with the calculated bolometric responsivity. The bolometric response is expected to operate at terahertz frequencies, and we discuss some of the practical issues associated with developing high frequency detectors based on carbon nanotubes.