

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Thermal conductance and bolometric response of individual single-walled carbon nanotubes**<sup>1</sup> DANIEL SANTAVICCA, JOEL CHUDOW, ANTHONY ANNUNZIATA, LUIGI FRUNZIO, DANIEL PROBER, Dept. of Applied Physics, Yale University, MENINDER PUREWAL, PHILIP KIM, Depts. of Physics and Applied Physics, Columbia University — We describe low temperature electrothermal characterizations of individual single-walled carbon nanotubes on insulating substrates. The increase in differential resistance with increasing dc bias current is attributed to Joule heating. This is confirmed by Johnson noise thermometry, and thus the resistance can be used as a direct probe of the average electron temperature. These measurements enable us to determine the nanotube thermal conductance. We also measure the rf heterodyne response and find that the data agree well with a linear response bolometric model using our experimental value for the thermal conductance. This is the first demonstration of bolometric detection in an individual nanotube.

<sup>1</sup>This work is supported by NSF-CHE-0616875 (Yale) and NSF-DMR-0349232 (Columbia).

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Date submitted: 21 Nov 2008

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