

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Excess low temperature heat capacity in a-Si:H thin films prepared by hot-wire CVD**<sup>1</sup> DANIEL QUEEN, FRANCES HELLMAN, University of California, Berkeley, RICHARD CRANDALL, QI WANG, National Renewable Energy Lab — Thin films of *a*-Si:H prepared by hot-wire chemical vapor deposition (HWCVD) have previously been found to have orders magnitude lower density of two-level systems (TLS) as measured by internal friction. These TLS are thought to be responsible for the low temperature universality seen in thermodynamic measurements in all amorphous materials. We present heat capacity measurements using our MEMS nanocalorimeter on a range of *a*-Si and *a*-Si:H films prepared by e-beam evaporation and HWCVD. The tunneling model predicts that a reduction in the TLS should result in Debye-like heat capacity. However, we find that the low temperature heat capacity of *a*-Si:H prepared by HWCVD is two orders of magnitude larger than crystalline silicon at 2K.

<sup>1</sup>This research is supported by NSF Grant DMR-0907724.

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Date submitted: 08 Dec 2009

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