

Abstract Submitted  
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**Specific heat of amorphous materials outside of the universal regime: *a*-Si and *a*-Si:H** DANIEL QUEEN, University of California, Berkeley, QI WANG, RICHARD CRANDALL, National Renewable Energy Lab, FRANCES HELLMAN, University of California, Berkeley — We present specific heat measurements for *a*-Si and *a*-Si:H films that are known to lack the broad distribution of tunneling level systems (TLS) as measured by internal friction. Below 1K the TLS model describes the universal behavior seen in specific heat, thermal conductivity, and other measurements. However, this model does not address the universal high temperature features, namely, the plateau in  $k$  and peak in  $C/T^3$  that occur around 10K. Tetrahedrally bonded systems, such as *a*-Si and *a*-Ge, have long been thought to lack TLS due to the over constrained nature of their bonding. These materials prove difficult to quench from a bulk melt but are routinely grown by vapor deposition. We use our MEMS nanocalorimeter for heat capacity measurements between 2-300K on a range of *a*-Si and *a*-Si:H films prepared by e-beam evaporation and Hot-wire CVD. Changes in the high temperature specific heat will be discussed for films that are known to have orders of magnitude lower densities of TLS as measured by internal friction.

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