Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Quantum-dot thermometry applied to the study of electron-phonon interaction in nanowires ERIC HOFFMANN, JASON MATTHEWS, University of Oregon, Eugene, Oregon, HENRIK NILSSON, LARS SAMUELSON, Lund University, Sweden, HEINER LINKE, University of Oregon, Eugene, Oregon — The thermal properties of mesoscopic devices are greatly influenced by quantum and finite-size effects. For example, the influence of electron-phonon coupling on heat flow through nanowires is different than in bulk materials and has not been studied in detail. One challenging aspect of performing thermal experiments with a mesoscopic device is the application and quantification of a temperature difference across a sub-micron distance. The recently introduced quantum-dot thermometry[1,2] uses a quantum dot to measure the electronic temperature difference across the dot's dimension. We present here experimental results demonstrating quantum-dot thermometry using a quantum dot embedded in an InAs nanowire. In addition, we show result which suggest that quantum-dot thermometry can be used to measure the strength of electron-phonon interaction in a one-dimensional nanowire. 1. Hoffmann, E.A. *et al.*, *Quantum-dot thermometry*, Appl. Phys. Lett. **91**(25), 252114 (2007). 2. Hoffmann, E.A. *et al.*, *Measuring temperature gradients over nanometer length scales*, Submitted to Nano Letters (2008).

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Date submitted: 20 Nov 2008 Electronic form version 1.4