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Nanoscale Thermal Imaging KAMAL BALOCH, TODD BRINTLINGER, YI QI, University of Maryland College Park, DAVID GOLDHABER-GORDON, Stanford University, JOHN CUMINGS, University of Maryland College Park — We present real time, in-situ, high resolution thermal imaging of metallic nanowires. The nanowires are grown on the front-side of silicon nitride membranes. Resistive heating along the wires produces thermal gradients which melt/freeze 20-200nm diameter indium islands deposited by thermal evaporation on the back-side of the membrane. These transitions can be imaged using a transmission electron microscope operating in dark-field mode such that contrast corresponds to the phase of an individual island. Global changes in temperature can be used to calibrate the melting point of individual islands and to account for the presence of the ∼100nm thick silicon nitride membrane. Thermal modeling confirms the imaged thermal behavior. This technique could be generally employed for thermal imaging of nanowires and nanotubes, wherein the nanoscale systems are imaged in-situ and under electrical bias. Results of local resistive heating in a carbon nanotube device will also be shown

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