

Abstract Submitted
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Thermal Effects in Precision Nano-Electronics Construction

STEPHEN JOHNSON, DOUGLAS STRACHAN, University of Kentucky — The development of high precision nano-electronics requires a detailed understanding of the non-equilibrium thermal effects during their construction and use. To better understand the dynamics of these nano-scale thermal effects, we investigate nanowires and nano-scale junctions of various dimensions with applied electric currents. During the application of current, significant joule heating occurs which induces the structures to evolve through thermo- and electromigration processes. A distinct change in the symmetry of these processes indicates that different mechanisms occur at the various stages of evolution. The results are compared to detailed thermal modeling of our structures and have implications on the development of a wide range of novel nanoscale devices. Supported in part by NSF Award No. DMR-0805136, the Kentucky NSF EPSCoR program, the University of Kentucky Center for Advanced Materials, and the University of Kentucky Center for Nanoscale Science and Engineering.

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