Abstract for an Invited Paper
for the SES09 Meeting of
The American Physical Society

Thermophysical Properties of Nanowires, Nanotubes, and Nanoribbons

DEYU LI, Vanderbilt University

Thermal transport through various kinds of nanowires, nanotubes, and nanoribbons has attracted significant attention over the past a few years because of the intriguing nano-confinement effects on the energy carriers, which can lead to novel thermophysical properties that are promising for practical applications such as thermoelectrics. Compared to measurements performed on ensembles of nanostructures, measurements of thermophysical properties of individual nanostructures can eliminate uncertainties from the morphology variation of the nanostructures. However, measurements of the thermophysical properties of individual nanostructures pose a significant challenge because of the low thermal conductance of individual nanostructures and the fact that there is no thermal insulator. We have successfully developed a suspended microdevice with integrated resistance heaters and thermometers and applied it to study thermophysical properties of various kinds of individual nanowires, nanotubes and nanoribbons. Measurement results indicate interesting confinement effects on the transport of energy carriers in these nanostructures.