[Nano device]

Transport and Scanned Probe Investigations of Carbon Nanostructures

Hongkun Park
Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA 02138

In this presentation, transport and scanned probe investigations of individual C60 molecules and single-walled carbon nanotubes will be discussed. First, transport spectroscopy of single-C60 transistors will be discussed that provides evidence for coupling between mechanical oscillations of C60 and single-electron hopping. Secondly, coupled scanned probe and transport measurements on individual single-walled carbon nanotubes will be discussed that show the occurrence of resonant electron scattering from individual structural defects. Finally, transport measurements of nanotube electron waveguides will be described that exhibit Fabry-Perot interference between electron waves traveling along the nanotube. These examples demonstrate the utility of transport and scanned probe investigations in probing the electronic motion in nanostructured materials.