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Fabricating Substrates to Combine Electron Microscopy and Diffraction with Electrical Characterization of Single and Double-Walled Carbon Nanotubes SCOTT PAULSON, LOK-KIN TSUII, JOSEPH HARDCASTLE, James Madison University — Carbon nanotubes based electronics make model systems for pursuing electronic devices at the nanometer scale. They are chemically robust, and have well defined easily predictable electronic structure. However, device integration requires not just an understanding of the nanotube properties, but also the properties of interfaces between neighboring elements. Ideally the structure-property relationship of the interface between two nanotubes would consist of complete electrical characterization coupled with atomic scale structural information. The former is achieved by lithographic patterning of a nanotube into a circuit, the latter through high resolution TEM imaging and diffraction. Unfortunately, typical TEM preparation of nanotubes is not compatible with lithographic processing and vice-versa. In this talk we will present a fabrication process that integrates carbon nanotubes into devices on a TEM compatible substrate. Sample devices will be shown, and preliminary data will be presented.

Scott Paulson
James Madison University

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