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Scanning gate microscopy of electronic inhomogeneities in single-walled carbon nanotube (SWCNT) devices STEVEN R. HUNT, PHILLIP G. COLLINS, Department of Physics and Astronomy, Univ. of California Irvine, Irvine, CA 92697-4576 — The electronic properties of graphitic carbon devices are primarily determined by the contact metal and the carbon band structure. However, inhomogeneities such as substrate imperfections, surface defects, and mobile contaminants also contribute and can lead to transistor-like behaviors. We experimentally investigate this phenomena in the 1-D limit using metallic single-walled carbon nanotubes (SWCNTs) before and after the electrochemical creation of sidewall defects. While scanning gate microscopy readily identifies the defect sites, the energy-dependence of the technique allows quantitative analysis of the defects and discrimination of different defect types. This research is partly supported by the NSF (DMR 08-xxxx).

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