

Abstract Submitted  
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**Distinguishing the mechanisms of transistor-like switching in single-walled carbon nanotubes (SWCNTs)** STEVEN HUNT, BRETT GOLDSMITH, PHILIP G. COLLINS — One of four mechanisms usually dominates the conductance switching of SWCNTs in field effect transistor geometries. In semi-conducting SWCNTs, both the bandstructure and the Schottky barriers present at the SWCNT-electrode interface are sensitive to local electric fields. Disorder, too, leads to field sensitivity through SWCNT-SWCNT junctions and SWCNT defect sites. These four mechanisms can be distinguished by scanning gate microscopy, in which the local gating characteristics of interfaces, defects, and pristine sidewall can each be independently measured. We will demonstrate this separation and, in particular, focus on the gate sensitivity of sidewall defects produced by point functionalization. Scanning gate microscopy of SWCNTs before and after chemical attack allows us to visualize the electronic contributions of localized disorder and rank its contribution to three-terminal device characteristics.

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