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**Quantitative Characterization of Defect Densities in Single-Walled Carbon Nanotubes** YUWEI FAN, NATHAN EMMOTT, PHILIP G. COLLINS, Department of Physics and Astronomy, University of California Irvine, Irvine, CA 92697-4576 — Carbon nanotubes are often imagined to be pristine, defect-free objects, but different types of synthesis and processing are known to result in materials of different qualities. We have developed a method for the quantitative characterization of nanotube defect densities which can readily be used to compare nanotubes from different batches or processes. The method relies on the enhanced chemical reactivity of defect sites as compared to the graphene lattice. By tailoring the potentials used in electrochemical deposition, we selectively seed the growth of metal particles at reactive defect sites without decorating the bulk of a carbon nanotube. Because the metal particles can subsequently be grown 50 nm in diameter or larger, they are easily counted by low magnification SEM imaging, allowing for good statistics and wafer-scale characterization. We will demonstrate the results of this method on a batch of CVD-grown nanotubes and compare the measured defect density against nanotubes from other sources. This work has been supported by NSF-DMR.

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