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Massively Parallel Imaging and Electrical Characterization of Carbon Nanotube Transistors with Scanning Thermocurrent Microscopy
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— Electrical characterization of individual carbon nanotubes (CNTs) is a painstaking and time-consuming process, requiring a serial study of individual CNT devices. We present a novel method utilizing a laser-based setup[1] to simultaneously image and electrically characterize a multitude of CNTs in a parallel transistor array geometry, foregoing the need to create individual CNT devices in the study of their electronic transport. The diffraction-limited laser spot induces local heating of the CNT and affects overall conductance under applied bias, presenting a spatially-resolved visual image of the CNT in our measurement scheme. Furthermore, this change in conductance displays gate dependence similar to that of overall conductance of the CNT, allowing us to probe the local electronic properties of the CNT simultaneously. Using this technique we are then able to both image with diffraction-limited resolution and electrically characterize up to hundreds of CNTs rapidly in the simplest of device geometries. 1. Y. H. Ahn, A. W. Tsen, B. Kim, Y. W. Park, and J. Park, "Photocurrent Imaging of p-n Junctions in Amibipolar Carbon Nanotube Transistors," *Nano Letters*, vol. 7, no. 11, pp. 3320-3323, 2007.

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