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**Probing the transport property of each individual wall within a multiwall carbon nanotube** X. YAN, J.Y. HUANG, S. CHEN, Z. WANG, Department of Physics, Boston College, Chestnut Hill, MA 02467, G. CHEN, Department of Mechanical Engineering, MIT, Cambridge, MA 02139, M.S. DRESSELHAUS, Department of Physics, Electrical Engineering and Computer Science, MIT, Cambridge, MA 02139, Z.F. REN, Department of Physics, Boston College, Chestnut Hill, MA 02467 — We report the atomic-scale imaging with concurrent transport measurements of the breakdown of individual multiwall carbon nanotubes inside a transmission electron microscope equipped with a piezo manipulator [1]. We found unexpectedly three distinct breakdown sequences, namely, from the outermost wall inward, from the innermost wall outward, and alternatively between the innermost and the outermost walls. Remarkably, a significant amount of current drop was observed when an innermost wall is broken, proving unambiguously that every wall is conducting. Moreover, the breakdown of each wall in any sequence initiates in the middle of the nanotube, not at the contact, proving that the transport is not ballistic. [1] J. Y. Huang et al., Phys. Rev. Lett. 94, 236802 (2005).

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