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Fracture Strength of Multi-wall Carbon Nanotubes WEIQIANG DING, LORENZO CALABRI, XINQI CHEN, KEVIN KOHLHAAS, RODNEY S. RUOFF*, NORTHWESTERN UNIVERSITY TEAM[1], NICOLA PUGNO, POLITECNICO DI TORINO COLLABORATION[2] — Arc-grown MWCNTs were studied with tensile loading experiments inside an SEM with a home-built nanomanipulator. A newly developed and rapid electron beam induced deposition method was used to make the clamps. HR-SEM images were acquired at each loading step, and two independent methods of analysis of each image were used to obtain the corresponding tensile load. The MWCNT diameters were measured by TEM after the tests. The stress *vs.* strain, Young's modulus, and tensile strength of the MWCNTs were obtained through data analysis. The measurements strongly suggest the presence of defects in the tested nanotubes. Assuming defects like clusters of adjacent vacancies (e.g., atomistic blunt cracks) the experimental evidence is rationalized by applying Quantized Fracture Mechanics. *We gratefully acknowledge the grant support from the NSF (#020079; #030450); ONR #N000140210870 (support for W. Ding), and NASA BIMat URETI # NCC-1-02037(support for X. Chen).*

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