Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

X-ray Radiation Damage Studies of Individual Nanotubes and Nanowires H.D. MO, C. NELSON, C.-C. KAO, NSLS, BNL, M. SFEIR, A. BOLLINGER, I. BOZOVIC, J. MISEWICH, Dept. of Condensed Matter Phys. & Material Sci., BNL, A. STEIN, Instrumentation Division, BNL, W. LIU, P. ZSCHACK, APS, ANL, N. BOZOVIC, Dept. of Mathmatics, San Jose State Univ. — The development of techniques for x-ray studies of individual nanomaterials is motivated by the spectroscopic, structural, and dynamic information that x-rays provide. In combination with other probes (e.g., STM), x-ray techniques promise the complete characterization of nanomaterial properties and functionality, which can be used as feedback for the synthesis of useful nanomaterials. The feasibility of x-ray studies of individual nanomaterials is approaching due to ongoing improvements in x-ray focusing optics and synchrotron radiation sources that together lead to increasing flux densities. However one possible barrier concerns the effects of high intensity x-ray beams on hard nanomaterials, about which little is currently known. Therefore here we report on x-ray damage studies of individual carbon nanotubes and SrRuO3 nanowires. Samples of the two systems were exposed to microfocused x-rays on APS beamline 34-ID for variable amounts of time. Pre-and post-exposure SEM imaging was used to qualitatively study the effects on carbon nanotubes, and real-time monitoring of sample integrity was provided by measuring a current passing through the SrRuO3 nanowires during the exposure. This research is supported by the DOE, under contracts DE-AC02-98CH10886 (BNL) and W-31-109-ENG-38 (ANL).

Haiding Mo
Brookhaven National Laboratory, Upton, NY 11973

Date submitted: 29 Nov 2006 Electronic form version 1.4