Abstract Submitted for the MAR09 Meeting of The American Physical Society

Exciton Dynamics in Individual Single-walled Carbon Nanotubes MARAT KHAFIZOV, SHUJING WANG, LISA J. CARLSON, TODD D. KRAUSS, Department of Chemistry, University of Rochester, Rochester, New York 14627, MING ZHANG, DuPont Central Research and Development, Experimental Station, Wilmington, Delaware 19880 — Optical excitation of single-walled carbon nanotubes (SWNTs) results in strongly bound excitons. The dynamics and energetic pathways available to the exciton as it relaxes back to the ground state have recently received significant attention. We have performed transient absorption (TA) experiments on DNA-wrapped (6,5) SWNTs in the extremely low-excitation fluence regime. Excitation was provided by a Ti-sapphire oscillator whose output was focused into a highly nonlinear photonic crystal fiber generating a coherent, femto second white-light source. We found the recovery of the photobleach signal for excitons in the 1st and 2nd excited states $(E_{11} \text{ and } E_{22})$ was governed by power-law dynamics. Interestingly, we also observed an induced absorption feature in the TA spectrum to the blue of the E_{11} exciton that showed the same recovery dynamics as the photobleach signal, suggesting that they share a common origin. We will discuss the physical origins of the observed features in the TA spectrum in the context of current models of exciton states of the SWNT.

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Date submitted: 21 Nov 2008

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