

Abstract Submitted
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Measurement of Optical Stark Effect in Semiconducting Single-Walled Carbon Nanotubes DAOHUA SONG, FENG WANG, GORDANA DUKOVIC, LOUIS E. BRUS, TONY F. HEINZ, Columbia University, New York, NY 10027, M. ZHENG, G.B. ONOA, E.D. SEMKE, DuPont Central Research and Development, Wilmington, DE 19880 — The optical Stark effect in quantum-confined systems, such as quantum wells, has been the subject of active interest for many years. In this paper we present the first measurement of the optical Stark effect in carbon nanotubes. In our experiment we used two-color femtosecond spectroscopy to probe the E_{11} transition in the nanotubes while applying a strong optical pump beam at significantly lower photon energy (the large detuning limit). The sample was an aqueous suspension of (6,5)-enriched single-walled carbon nanotubes. An instantaneous shift in the absorption line by up to 1 meV was observed; the magnitude of the shift scaled linearly with the pump intensity. The nature of the optical Stark effect in the carbon nanotube system, with its strong excitonic transitions, will be discussed.

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