

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Ultrafast nonlinear spectroscopy characterization of CdSe quantum dots QIGUANG YANG, SEONGMIN MA, BAGHER TABIBI, JAETAEO SEO, Hampton University, WILLIAM YU, Worcester Polytechnic Institute, HAMPTON UNIVERSITY COLLABORATION, WORCESTER POLYTECHNIC INSTITUTE COLLABORATION — Frequency degenerate and nondegenerate two-photon absorption spectra of direct band gap semiconductor quantum dots, such as CdSe and CdTe, have attracted great attention recently because of their potential applications in nonlinear photonic devices. In this work, we used the femtosecond time-resolved photon echo technique to characterize the third-order nonlinear optical properties of CdSe quantum dots in toluene. The quantum dots had an average size of about 3 nm and the lowest absorption peak at 559 nm. A femtosecond laser with 150 fs pulsewidth and 1 KHz repetition rate was used for the measurement. The copolarization hyperpolarizability at 775 nm was found to be about $-1 \times 10^{-43} \text{ m}^6/\text{V}^2$ and the dephase time was shorter than the resolution limitation of our system at room temperature. This work at Hampton University was supported by Army Research Office (W911NF-07-1-0608) and National Science Foundation (HRD-0734635, HRD-0630372, ESI-0426328/002, and EEC-0532472).

JaeTae Seo
Hampton University

Date submitted: 30 Nov 2007

Electronic form version 1.4