Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Two-photon absorption in 3-100nm diameter Silicon nanocrystals in solution BRANDON FUREY[1], MICHAEL DOWNER[2], YIXUAN YU[3], BRIAN KORGEL[4], University of Texas at Austin — Silicon nanocrystals (nc-Si) exhibit efficient photoluminescence (PL) that has applications in non-toxic bio-imaging. Two-photon absorption (TPA) is an important process for exciting PL in the tissue transparency spectral window, but absolute TPA coefficients have not been measured as a continuous function of nc size or excitation wavelength. Previous TPA studies have focused on nc-Si embedded in an oxide matrix or on porous Si surfaces at selected discrete wavelengths [1]. However, recently free standing, ligand-stabilized nc-Si with diameters ranging from 3 to 100 nm that are soluble in liquids, including water, and suitable for bio-imaging have become available [3]. We will present calibrated TPA spectra for free standing nc-Si over a wide range of nc diameters, based on measurements with tunable femtosecond laser pulses. We will compare indirect TPA measurements based on collection and detection of PL with direct TPA measurements based on attenuation of the incident beam. [1] P. Zhang, Z. Zhang, K. Chen et al., Nanoscale Res. Lett. 9 (28), 1 (2014) [2] C.M. Hessel, J. Wei, B. Korgel et al., Chem. Mater. 24 (2), 393 (2012)

[1]Department of Physics
[2]Department of Physics
[3]Department of Chemical Engineering
[4]Department of Chemical Engineering

Brandon Furey
University of Texas at Austin

Date submitted: 06 Nov 2015 Electronic form version 1.4