Abstract Submitted for the MAR08 Meeting of The American Physical Society

Photon-Correlation Fourier Spectroscopy on CdSe Nanocrystals LISA MARSHALL, Massachusetts Institute of Technology, XAVIER BROKMANN, Capital Fund Management, MOUNGI BAWENDI, Massachusetts Institute of Technology — The emission spectrum of a single emitter can be artificially widened and blurred due to fluctuations in emission energy, i.e. spectral diffusion. This spectral diffusion can be much more rapid than the time required to collect sufficient photons to measure a spectrum. We use a new method, Photon-Correlation Fourier Spectroscopy (PCFS), to "freeze" spectral diffusion and obtain spectral information of single CdSe nanocrystals on timescales comparable to the lifetime of the emit-This method cross-correlates the two outputs of a Michelson interferometer, ter. providing a histogram of frequency shifts between two photons separated by a given We apply PCFS to single nanocrystals in a confocal geomeamount of time. try. We also combine PCFS with Fluorescence Correlation Spectroscopy (FCS) to resolve single nanocrystal linewidths from a solution of nanocrystals diffusing under a microscope objective.

> Lisa Marshall Massachusetts Institute of Technology

Date submitted: 27 Nov 2007

Electronic form version 1.4