Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Quantum dot dispersion in nematic liquid crystal J. KIRCHHOFF, Florida State University, R.H. INMAN, D.S. CHANDHOK, S. GHOSH, L.S. HIRST, University of California Merced — Optical and electrical properties of quantum dots can be significantly altered by aligning the dots in a linear chain. Dispersing quantum dots in liquid crystals can lead to the formation of linear chains due to the partial ordering of the liquid crystal molecules. Typically, this results in a red shift in the emission spectrum of the dots as the induced order leads to enhanced dipolar interactions, resulting in electronically coupled states. Dispersions of quantum dots are studied as a function of the concentration, size, and shape of the dots in a nematic rod-like liquid crystal material. The quantum dots are seen to aggregate if the concentration of the dots is too high, leading to little correlation between the quantum dot dispersion and liquid crystal texture. In decreasing the quantum dot concentration the aggregates lessen in size and are more uniformly distributed within the liquid crystal. Spherical, rod-like, and disc-like quantum dots with emission peaks ranging from 490 nm to 640 nm were studied using polarized optical microscopy and scanning microscopy photoluminescence measurements.

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Date submitted: 21 Nov 2008 Electronic form version 1.4