

Abstract Submitted
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Measurement of the separation dependence of the resonant energy transfer between CdSe nanocrystals FARBOD SHAFIEI, RICARDO S. DECCA, Department of Physics, Indiana University Purdue University Indianapolis — An apparatus has been developed to study the separation dependence of interaction between two resonant groups of CdSe/ZnS quantum dots. A near-field scanning optical microscope (NSOM) is used to bring a group of mono-disperse 5.5 nm dots close (near-field range) to an 8.5 nm group of dots which are deposited on a solid immersion lens. The size of the small and large nanocrystals dots have been selected to make the excitonic ground state of the small dots coincide with the excited state of the large dots, as determined by photoluminescence and photoluminescence excitation experiments. Combination of spectral and positional filtering allows us to measure the interaction between a few quantum dots (with the ultimate goal of identifying the interaction between individual dots). The analysis of the separation-dependent photoluminescence signal from the two groups of quantum dots, yields the dipole-dipole and higher order (dipole-quadrupole) interaction terms. We expect that our results will improve the knowledge of the quantum states and decoherence processes in quantum dots.

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