

Abstract Submitted
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Superradiance Of Quantum Dots MICHAEL SCHEIBNER¹, THOMAS SCHMIDT, LUKAS WORSCHECH, ALFRED FORCHEL, Technical Physics, University Wuerzburg, 97074 Wuerzburg, Germany, GERD BACHER, Werkstaoffe der Elektrotechnik, University Duisburg-Essen, 47057 Duisburg, Germany, THORSTEN PASSOW, DETLEF HOMMEL, Institute of Solid State Physics, University Bremen, 28359 Bremen, Germany — Quantum dots (QDs) may be considered to form a coupled quantum system if they interact with a common radiation field. By its nature the range of this coupling mechanism is on the order of the radiation wavelength and its signature is a modified radiation rate. Here we analyze the decay time of the photoluminescence emitted from a single layer of self assembled CdSe/ZnSe QDs [1]. We find that the decay time depends on the number of QDs. For example, under (quasi-) resonant excitation conditions the decay time increases as QDs are removed from the sample by etching mesas. This indicates that in the as grown sample QDs radiate cooperatively. The range of this interaction is shown to be at least 150 nm. [1] Scheibner, et al. ‘Superradiance of Quantum Dots’, submitted for publication

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