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Cavity -Quantum Dot interactions and mode coupling in a nanocavity VIJAY KASISOMAYAJULA, ONOFRIO RUSSO, New Jersey Institute of Technology — We describe an approach for realizing effective manipulation of single electron state level transitions for quantum dots mediated by a nano-cavity. The two quantum dots interact with the cavity for the two dot system in the coulomb blockade energy region. Because of the zero dimensional structure of the quantum dots, the system can be implemented to be a characteristic entity for an efficient generator of single photons. This process is emphatically more selective in the coulomb/spin blockade region, where also, the system efficiency of the single photon event is most likely more probable. Whereas, it is clear that the photon efficiency is small, the cavity quantum electrodynamics (CQED) nature suggests an enhancement in the electron energy state being occupied by the second quantum dot. This is more likely with very strong coupling of the quantum dots to the cavity with cavity quality factors larger than perhaps 10^5. Quality factors in excess of 10^5have been demonstrated experimentally[1]. 1. K. Srinivasan, M. Borselli, T. J. Johnson, P. E. Barclay, O. Painter, A. Stintz, and S. Krishna, Appl. Phys. Lett. **86**, 151106 (2005). [ISI]

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