Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Full Counting Statistics of Photons Emitted by a Double Quantum Dot[1] CANRAN XU, MAXIM VAVILOV, University of Wisconsin — We analyze the full counting statistics of photons emitted by a double quantum dot (DQD) to a high-quality microwave resonator due to the dipole coupling. We show that at the frequency matching condition $\omega_0 = \Delta E/\hbar$ for the energy splitting ΔE of the DQD and the resonator frequency ω_0, photon statistics exhibits both a sub-Poissonian distribution and anti-bunching. In the ideal case, when the system decoherence stems only from photo-detection process, the photon noise is reduced to nearly one-half of the noise for the Poisson distribution. The photon distribution remains sub-Poissonian even at moderate decoherence in the DQD, but eventually become super-Poissonian in the regime of strong decoherence of the DQD.

[1]Supported by NSF-DMR grants 0955500 and 1105178.

Canran Xu
University of Wisconsin

Date submitted: 08 Nov 2012 Electronic form version 1.4