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Title: Full counting statistics of Photons Emitted by Double Quantum Dot strongly coupled to high-Q resonator.

Abstract: A strong coupling between a double quantum dot (DQD) and a microwave field in a high-quality resonator was recently achieved by several experimental groups. When an electric bias is applied to the DQD, the experiments realize an out-of-equilibrium interacting fermion--photon system. I will discuss statistical properties of electron transfer through the DQD and photon emission from the resonator. I will show that statistics of photons has signatures of a Fermi statistics due to photon creation caused by electrons. Under certain conditions, photon emission from the resonator obeys sub-Poissonian statistics and photons exhibit anti-bunching. If the DQD has inelastic relaxation, however, the photon field quickly reaches a thermal state: its intensity correlation function becomes similar to that of a thermal photon source and the photon emission statistics is super-Poissonian. In this talk, I will present a master equation approach to calculate the full counting statistics of emitted photons. Then, I discuss the width of the distribution of photon counts as a function of microscopic parameters of the system. I will also discuss an experimental setup for studying photon emission statistics by counters based on Josephson junctions.

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