Abstract Submitted
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Rabi-Vibronic resonance at large number of vibrational quanta[1] MIKHAIL RAIKH, RACHEL GLENN, University of Utah — Rabi oscillations of a resonantly driven two-level system (qubit) which is linearly coupled to a cavity (vibrational mode) with frequency, ω_0, much smaller than the driving frequency, are studied theoretically. We show that, for small coupling constant $\lambda \ll 1$, Rabi oscillations are strongly modified in the vicinity of the *Rabi-vibronic resonance* $\Omega_R = \omega_0$, where Ω_R is the Rabi frequency proportional to the amplitude of the driving field. The width of the resonance is shown to be $(\Omega_R - \omega_0) \sim \lambda^{4/3}\omega_0$, and is much larger than the polaronic frequency shift, $\lambda^2\omega_0$. We show that within the resonant domain of Ω_R the actual frequency of the Rabi oscillations exhibits bistable behavior as a function of Ω_R. Most importantly, within the resonant domain, the oscillator is highly excited, which allows one to treat it classically. Decay of the Rabi oscillations due to losses in the cavity and spontaneous emission of two-level system are also studied.

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