

Abstract Submitted
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Analysis of non-adiabatic effects in circuit QED measurement of a transmon ERIC MLINAR, MOSTAFA KHEZRI, University of California, Riverside, JUSTIN DRESSEL, Chapman University, ALEXANDER N. KOROTKOV, University of California, Riverside — In a circuit QED setup with a transmon qubit dispersively coupled to a driven resonator, we investigate whether rapid resonator ringup will cause nonadiabatic effects that disturb the qubit state. We show that only unrealistically fast high-power pulses will produce significant deviations from adiabatic behavior, while typically the qubit-resonator dynamics is well described by coherent evolution in the joint eigenbasis. Nevertheless, even in typical parameter regimes we show that the qubit nonlinearity still produces a dynamical shearing effect that squeezes the state of the resonator field.

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