

Abstract Submitted
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Driven dynamics of a qubit tunably coupled to a harmonic oscillator¹ SIMON GUSTAVSSON, JONAS BYLANDER, FEI YAN, POL FORN-DIAZ, Massachusetts Institute of Technology, VLAD BOLKHOVSKY, DANIELLE BRAJE, STEVEN SPECTOR, BEN TUREK, PAUL B. WELANDER, MIT Lincoln Lab, FUMIKI YOSHIHARA, NEC, DAVID. G. CORY, University of Waterloo, YASUNOBU NAKAMURA, NEC, WILLIAM D. OLIVER, Massachusetts Institute of Technology, MIT Lincoln Lab — We have investigated the driven dynamics of a superconducting flux qubit that is tunably coupled to a microwave resonator. We find that the qubit experiences an additional oscillating field mediated by off-resonant driving of the resonator, leading to unanticipated, strong modifications of the qubit Rabi frequency. Low-frequency noise in the coupling parameter translates to an effective noise in the amplitude of the drive field, causing a reduction of the coherence time during driven evolution. The noise can be mitigated with the rotary-echo pulse sequence, which, for driven systems, is analogous to the Hahn-echo sequence.

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