

Abstract Submitted
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Photon-number-dependent Purcell relaxation rate¹ EYOB A. SETE, University of California, Riverside, JAY M. GAMBETTA, IBM T.J. Watson Research Center, ALEXANDER N. KOROTKOV, University of California, Riverside — We analyze the Purcell relaxation rate of a superconducting qubit coupled to a resonator, which is coupled to a transmission line and pumped by an external microwave drive. Considering the typical regime of the qubit measurement, we focus on the case when the qubit frequency is significantly detuned from the resonator frequency. Surprisingly, the Purcell rate decreases when the strength of the microwave drive is increased. This suppression becomes significant in the nonlinear regime. The microwave drive also causes excitation of the qubit; however, the excitation rate is much smaller than the relaxation rate. Our analysis also applies to a more general case of a two-level quantum system coupled to a cavity.

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