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Measurements of Relaxation in Superconducting Flux Qubits¹ P.A. REICHARDT, T. HIME, B.L.T. PLOURDE, T.L. ROBERTSON, C.-E. WU, JOHN CLARKE, University of California, Berkeley — The exchange of energy between a qubit and its environment leads to the decay of an excited state, characterized by the inelastic relaxation time. This relaxation is determined by the noise in the qubit environment at the level splitting frequency. We have measured the relaxation time in a superconducting flux qubit by exciting the qubit with a resonant microwave pulse, and varying the time following the excitation before the qubit is read out with a Superconducting QUantum Interference Device (SQUID). We present the variation of the relaxation time with various parameters, such as the qubit level splitting, the readout SQUID operating point, measurement repetition time, and temperature. We compare our results with expected levels of noise in the qubit environment and discuss possible sources of the qubit relaxation.

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