

Abstract Submitted
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Characterizing measurement and feedback processes in superconducting qubit systems¹ N. OFEK, Y. LIU, M. HATRIDGE, S. SHANKAR, M.H. DEVORET, R.J. SCHOELKOPF, Departments of Applied Physics and Physics, Yale University — New strategies for quantum control have been enabled by integrating nearly quantum-limited amplifiers with long-lived superconducting qubits. We now record high fidelity single shot measurements that are also QND. We rely on these properties of our measurement to apply an active feedback on a quantum system. Understanding the degree to which they are QND is desirable. For example, if measurements are perfectly QND yet have finite fidelity, repeated measurements can improve the overall fidelity. In this talk, we present a formalism to quantify a number of important independent measurement parameters including fidelity and the QND degree. We then apply this formalism to characterize and optimize a feedback experiment.

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N. Ofek
Departments of Applied Physics and Physics, Yale University

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