

Abstract Submitted
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Single shot readout in a circuit QED system ANDREW HOUCK, Yale University, ALEXANDRE BLAIS, Universite de Sherbrooke, STEVEN GIRVIN, ROBERT SCHOELKOPF, Yale University — In the dispersive limit of circuit QED, photon transmission can be used for quantum non-demolition measurements of the state of a superconducting qubit. Here, we present an optimization of the measurement of a transmon qubit, including a new understanding of how measurement affects the rate of demolition. Both cavity and qubit parameters were optimized to maximize signal to noise without introducing substantial new channels for decoherence. Single shot readout fidelities of over 70% have been achieved, and greater than 90% fidelity should be possible with presently achievable coherence times. This opens up the possibility of observing quantum jumps in the state of the qubit. Work done in collaboration with the Yale circuit QED team.

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