Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Superconducting Qubit Readout Using Capture-Disperse-Release of Microwave Field ERIC MLINAR, University of California, Riverside — We analyze a measurement scheme for superconducting qubits via controlled capture, dispersion, and release of a microwave field. The Purcell effect is circumvented by using a tunable coupler to decouple the microwave resonator from the transmission line during dispersive interaction with the qubit. We show that fast and high-fidelity qubit readout can be achieved for nonlinear dispersive qubit-resonator interaction and for sufficiently adiabatic tuning of the qubit frequency. The Jaynes-Cummings nonlinearity results in self-developing quadrature squeezing of the resonator field below the standard quantum limit, leading to a significant decrease in measurement error.

Abstract APS
University of California, Riverside

Date submitted: 26 Mar 2013 Electronic form version 1.4