Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Tailoring Multiqubit Measurement Operators Through Dynamic Cavity States (Part 1)[1] J. BLUMOFF, K. CHOU, Departments of Physics and Applied Physics, Yale University, S. NIGG, University of Basel, M. REED, HRL, B. VLASTAKIS, R. HEERES, L. FRUNZIO, S. GIRVIN, M.H. DEVORET, R.J. SCHOELKOPF, Departments of Physics and Applied Physics, Yale University — Recent improvements in resonator coherence times in the field of superconducting qubits have allowed access to a rich new toolbox which takes advantage of their large and long-lived Hilbert space. In this talk, I introduce several techniques utilizing the cavity state and protocols built from these techniques. We condition the evolution of a cavity state via dispersive interactions with multiple qubits, and manipulate the system to implement quantum erasure, selectively reducing the space of the resulting entanglement. This can be tailored to create a spectrum of measurement operators including measurements on a selectable subset of the system. This ability is a prerequisite for most approaches to quantum error correction. The following talk will cover the experimental implementation.

[1]Work supported by IARPA and ARO

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Date submitted: 12 Nov 2013 Electronic form version 1.4