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Tailoring multi-qubit measurement operators through dynamic cavity states (Part 2)[1] K. CHOU, J. BLUMOFF, Departments of Applied Physics and Physics, Yale University, S. NIGG, Department of Physics, University of Basel, M. REED, HRL Laboratories, B. VLASTAKIS, R. HEERES, L. FRUNZIO, S. GIRVIN, M.H. DEVORET, R.J. SCHOELKOPF, Departments of Applied Physics and Physics, Yale University — Recent improvements in cavity coherence in cQED have allowed high precision manipulation of photonic cavity states, illustrating a powerful toolbox for manipulating and encoding quantum information in either superconducting qubits or cavity states. In order for this architecture to become a viable system for computation, it will be necessary to have the flexibility to probe both global as well as limited properties of a register of qubits. In particular, the ability to tailor measurement operators is a technology that will be required for error correction. Extending the theoretical framework discussed in the previous talk, we will show experimental work toward realizing this goal. Our design consists of a register of qubits coupled to a high Q storage cavity and ancilla qubit enabled fast readout through a low Q cavity.

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