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Superconducting qubit parameter optimization for remote entanglement[1] N. ROCH, M.E. SCHWARTZ, C. MACKLIN, R. VIJAY, I. SIDDIQI, QNL, UC Berkeley — The combination of coherent lifetimes in excess of 100 microseconds and robust operation of low noise parametric amplifiers has enabled experiments in which high fidelity continuous measurement can be performed, opening the door for measurement based quantum feedback. The first experiment realized in this regime aimed at stabilizing a dynamical state of a superconducting qubit using a closed feedback loop [1]. We explore the prospects of extending this unprecedented control to engineered networks comprised of several superconducting qubits and microwave cavities, with the particular goal of stabilizing a central feature of quantum mechanics: the entanglement. We will discuss the optimal choice of hardware—qubit, cavity, and circuitry—as well as measurement protocols for maximizing entanglement.

[1] R. Vijay et al., Nature 490, 77-80 (2012)

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Nicolas Roch
QNL, UC Berkeley

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