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Generating entanglement via measurement between two remote superconducting qubits[1] N. ROCH, M.E. SCHWARZT, QNL, University of California, Berkeley, F. MOTZOI, Department of Chemistry, University of California, Berkeley, C. MACKLIN, QNL, University of California, Berkeley, R. VIJAY, Tata Institute of Fundamental Research, Mumbai 400005, India, A.W. EDDINS, QNL, University of California, Berkeley, A.N. KOROTKOV, Department of Electrical Engineering, UC Riverside, B. WHALEY, Department of Chemistry, University of California, Berkeley, M. SAROVAR, Sandia National Laboratories, Livermore, I. SIDDIQI, QNL, University of California, Berkeley — Measurement has traditionally been viewed as a mechanism for restoring classical behavior: a quantum superposition, once observed, transforms into a single classical state. However, for some quantum systems it is possible to design a measurement that probabilistically projects onto an entangled state, thereby purifying, rather than destroying, quantum correlations. We use a joint dispersive readout to entangle two superconducting qubits, in individual cavities, separated by more than a meter of coaxial cable. We obtain a concurrence of 0.35, which is consistent with transmission losses and detector efficiency. The intensity of the readout pulse can be continuously varied, enabling us to monitor the dynamics of entanglement generation. The data agree with both a Bayesian model and a full master equation treatment.

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