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Preparing Schrodinger cat states by parametric pumping ZAKI LEGHTAS, STEVEN TOUZARD, IOAN POP, BRIAN VLASTAKIS, EVAN ZALYS-GELLER, VICTOR V. ALBERT, LIANG JIANG, LUIGI FRUNZIO, ROBERT J. SCHOELKOPF, Department of Applied Physics, Yale University, MAZYAR MIRRAHIMI, INRIA Paris-Rocquencourt, MICHEL H. DEVORET, Department of Applied Physics, Yale University — Maintaining a quantum superposition state of light in a cavity has important applications for quantum error correction. We present an experimental protocol based on parametric pumping and Josephson circuits, which could prepare a Schrodinger cat state in a cavity. This is achieved by engineering a dissipative environment, which exchanges only pairs or quadruples of photons with our cavity mode. The dissipative nature of this preparation would lead to the observation of a dynamical Zeno effect, where the competition between a coherent drive and the dissipation reveals non trivial dynamics. Work supported by: IARPA, ARO, and NSF.

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