Abstract Submitted
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**Stabilizing manifolds of quantum states by reservoir engineering**[1] ZAKI LEGHTAS, INRIA Paris-Rocquencourt, KURTIS GEERLINGS, SHYAM SHANKAR, Applied Physics Dept. Yale University, MAZYAR MIRRAHIMI, INRIA Paris-Rocquencourt, MICHEL DEVORET, Applied Physics Dept. Yale University, QLAB TEAM, SISYPHE TEAM — We consider the problem of stabilizing a manifold of states by reservoir engineering. Qubits are coupled to resonators in the strong dispersive limit for which the dispersive shift is much larger than the cavity decay rate. The resonators are driven by microwave fields. By adequately choosing the frequencies of these fields, we can transfer the entropy of the quantum system into its environment. This stabilization is autonomous and continuous in time, and does not rely on a precise control of the drive field amplitudes. The scheme does not require any knowledge of measurement outcomes thus simplifying its experimental realization. Experimental data on dynamical cooling of a transmon qubit coupled to a compact resonator will be shown. Finally, applications to quantum error correction will be discussed.

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