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Perfect squeezing by damping modulation in circuit quantum electrodynamics[1]

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Dissipation-driven quantum state engineering uses the environment to steer the state of quantum systems and preserve quantum coherence in the steady state. We theoretically show that modulating the damping rate of a microwave resonator generates a new squeezing mechanism that creates a vacuum squeezed state of arbitrary squeezing strength, thereby allowing perfect squeezing. Given the recent experimental realizations in circuit QED of a microwave resonator with a tunable damping rate, superconducting circuits are an ideal playground to implement this technique. By dispersively coupling a qubit to the microwave resonator, it is possible to obtain qubit-state dependent squeezing. Moreover, when two qubits are coupled to the resonator, damping modulation can be used to produce entanglement between the qubits. Preprint: arXiv:1307.5311.

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