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Title: Work fluctuations in the non-Hermitian dynamics of a superconducting qubit

Abstract: We investigate the behavior of an open quantum system governed by an effective non-Hermitian Hamiltonian in the context of quantum thermodynamics. Our experiment comprises a dissipative superconducting qubit subject to no-quantum-jump evolution, which exhibits quantum evolution described by complex energy eigenvalues. This motivates us to understand how the energetics and dynamics are represented in the eigenvalues of the system. We show that the Jarzynski equality is valid when the qubit's Hamiltonian obeys anti-linear (Parity-Time) symmetry, even though the dynamics are associated with complex eigenenergies. This talk will present the experimental results that explore these effects of dissipation in quantum thermodynamics.