

Abstract Submitted  
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**Autoresonant vs. ladder climbing response in a superconducting Josephson phase circuit** NADAV KATZ, YAARA ROFE, YONI SHALIBO, Hebrew University, RADOSLAW BIALCZAK, JOHN MARTINIS, UCSB, IDO BARTH, LAZAR FRIEDLAND, Hebrew University — Anharmonic oscillators exhibit a unique response to a chirped drive, referred to as either autoresonance or ladder climbing. This typically involves a bifurcation of the oscillation amplitude depending both on the strength of the drive and on the system's anharmonicity. In this parameter space, the threshold of bifurcation exhibits a transition between sequential state excitation (quantum ladder climbing) and the population of coherent-like states (classical autoresonance). Previous attempts to experimentally map this transition have only been possible in either classical or quantum conditions. Superconducting Josephson phase circuits enable us to map these two regimes, including the intermediate regime, due to their tunable anharmonicity. We measure the bifurcation phenomena in this system over the relevant parameter space where the transition is observed. We compare to numerical simulations and theoretical analysis.

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