

Publication

Quantum effects in amplitude death of coupled anharmonic self-oscillators

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Coupling two or more self-oscillating systems may stabilize their zero-amplitude rest state, therefore quenching their oscillation. This phenomenon is termed "amplitude death." Well known and studied in classical selfoscillators, amplitude death was only recently investigated in quantum self-oscillators [Ishibashi and Kanamoto, Phys. Rev. E 96, 052210 (2017)]. Quantitative differences between the classical and quantum descriptions were found. Here, we demonstrate that for quantum self-oscillators with anharmonicity in their energy spectrum, multiple resonances in the mean phonon number can be observed. This is a result of the discrete energy spectrum of these oscillators, and is not present in the corresponding classical model. Experiments can be realized with current technology and would demonstrate these genuine quantum effects in the amplitude death phenomenon.

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