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Quantum Dissipative Threshold and Its Effect on Decay of Metastable State

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Abstract: The coupling between system and reservoir is considered to be linear in the coordinates of the bath but nonlinear in the system's coordinate. A dissipative threshold is observed at finite temperatures due to nonlinear dissipation. The quantum decay rate of a metastable state including higher-order expanded terms of the coupling form function is proposed, which can be strongly decreased at finite temperatures when the quantum dissipative threshold is added to the saddle point of the potential.

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Key words: threshold, decay rate, nonlinear dissipation, quantum correction factor

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