

## Decoherence of a Quantum Nonlinear Oscillator Under a Non-zero Temperature Thermal Bath

HAN Li-Ping, ZHOU Ling, and SONG He-Shan

Department of Physics, Dalian University of Technology, Dalian 116023, China  
(Received: 2005-7-25; Revised: )

Abstract: The characteristic time  $\tau_D$  for decoherence process of a quantum nonlinear oscillator system under a non-zero temperature thermal bath is studied by expanding the linear entropy. By numerical analysis, it is shown that at a non-zero temperature, the quantum coherence decays much faster than at zero temperature. Moreover, the non-zero temperature thermal bath will bring a crucial suppression to the quantum effects of the observables, which causes these quantum effects to become unable to persist up to the Ehrenfest time but is insufficient to destroy the quantum-classical transition.

PACS: 42.50.Dv, 03.65.-w

Key words: quantum nonlinear oscillator, linear entropy, decoherence timescale

[\[Full text: PDF\]](#)

Close