

Center for Quantum Science and Engineering (CQSE)

Weekly Seminar
Dec. 31, 2010 (Friday)

TIME Dec. 31, 14:30 ~ 15:30
TITLE Non-Markovian dynamical effects and time evolution of the entanglement entropy of a dissipative two-state system
SPEAKER Dr. Zhiguo Lu 呂智國博士
Department of Physics, Shanghai Jiao Tong University
PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

We investigate the dynamical information exchange between a two-state system and its environment which is measured by the von Neumann entropy. It is found that in the underdamping regime, the entropy dynamics exhibits an extremely non-Markovian oscillation hump feature, in which oscillations manifest quantum coherence and a hump of envelop demonstrates temporal memory of bath. It indicates that the process of entropy exchange is bidirectional. When the coupling strength increases up to a certain threshold, the hump along with ripple disappears, which is indicative of the coherent-incoherent dynamical crossover. The long-time limit of entropy evolution reaches the ground-state value which agrees with that of the numerical renormalization group.

References:

1. Zhiguo Lu and H. Zheng, EPL 86 (2009) 60009.

