

Nonequilibrium Phase transition – Lindblad mesoreservoir approach –

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Recently, the method of meso-reservoirs was introduced by some of the authors [1]. The model has a system which coupled to several meso-reservoirs. The meso-reservoirs have finite degrees of freedom, and are enforced to nearly equilibrium state with the aids of the Lindblad dissipator. This model enables us to numerically efficiently discuss dynamics of a system coupled to several reservoirs. Using the meso-reservoir method, we study two types of phase transition.

The first is the quantum phase transition of XY chain at nonequilibrium steady state.

The second is the charge ordering of the 1-D extended Hubbard model. In this study, we study the dynamics of the model within the Born approximation.

[1] S. Ajisaka, F. Barra, C. Mejia-Monasterio, and T. Prosen, Phys. Rev. B **86**, 125111 (2012).