

Quantum Mpemba Effects

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Abstract

In the classical thermal Mpemba effect, an initially hot system relaxes faster to the final equilibrium state than a cold one. In this talk, I describe our generalization of the classical theory to the case of open Markovian quantum systems coupled to multiple (fermionic or bosonic) reservoirs [1]. We obtain a classification of possible quantum Mpemba effects in open quantum systems. We illustrate our results for an interacting two-site (“poor man”) Kitaev model and for an Anderson impurity. In both cases, the quantum system is assumed to be coupled to two metallic leads such that one can drive a transport current through the device.

References

- [1] A. Nava and R. Egger, Phys. Rev. Lett. **133**, 136302 (2024)

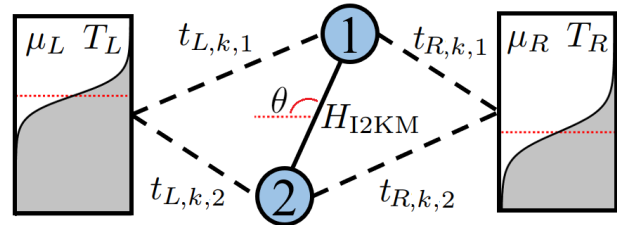


Figure 1: Interacting two-site Kitaev model sandwiched between two metallic leads [1].

Figures