

Adiabatically steered open quantum systems: Master equation and optimal phase

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Phys. Rev. A 82, 062112 (2010)

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<http://link.aps.org/doi/10.1103/PhysRevA.82.062112> [2]

We introduce an alternative way to derive the generalized form of the master equation recently presented by J. P. Pekola et al. Phys. Rev. Lett. 105 030401 (2010) for an adiabatically steered two-level quantum system interacting with a Markovian environment. The original derivation employed the effective Hamiltonian in the adiabatic basis with the standard interaction picture approach but without the usual secular approximation. Our approach is based on utilizing a master equation for a nonsteered system in the first superadiabatic basis. It is potentially efficient in obtaining higher-order equations. Furthermore, we show how to select the phases of the adiabatic eigenstates to minimize the local adiabatic parameter and how this selection leads to states which are invariant under a local gauge change. We also discuss the effects of the adiabatic noncyclic geometric phase on the master equation.

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