

NITheP Webinar

Thursday, 17 December 2020, 14h00

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Markovian approximation of non-Markovian dynamics in all orders of perturbation theory

Abstract: We consider the dynamics of the reduced density matrix for the spin-boson model in the rotating wave approximation with the reservoir at zero temperature. We show that if one considers the perturbation theory with Bogolubov-van Hove scaling, then the dynamics of the perturbative part of the reduced density matrix is described by the Gorini – Kossakowski – Sudarshan – Lindblad equation with constant coefficients. So, it is simpler than the usual time-convolutionless master equation derived by usual perturbation methods. We also show that the initial condition for the exact reduced density matrix and for its perturbative part generally do not coincide. Moreover, under certain resonance conditions the initial condition for the asymptotic equation should be not a density matrix to provide the given asymptotic precision outside the reservoir correlation time. The talk is based on arXiv:2008.02820.

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