PERLind, a versatile approach to model bath coupling in quantum kinetics

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The position and energy-resolved Lindblad approach (PERLind) [1] is general theoretical approach to study the quantum kinetics in a system coupled to a bath. It is based on a Lindblad master equation containing both the terms of the common secular approximation and further terms, which allow to track coherences between energy eigenstates due to localization at the position of contacts. We show that PERLind is able to interpolate between local and global approaches. Examples are given for a variety of systems including the quantitative simulation of quantum cascade lasers.

[1] G. Kirsanskas, M. Frankie ad A. Wacker, Phys. Rev. B97 (2018) 035432