A non-Markovian stochastic Schrödinger equation: Theory and applications

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Starting from the influence-functional description of open quantum systems, we have proposed a hierarchical stochastic Schrödinger equation (HSSE)[1], which is a kind of numerically exact wavefunction-based approaches suitable for the quantum dynamics simulation in a relatively large systems coupled to bosonic baths. This talk will outline the general theoretical framework of HSSE and its extensions, especially to the crystal momentum space for the description of carrier relaxation dynamics both in organic and inorganic semiconductors with incorporation of local and nonlocal electron-phonon interactions [2]. The validity of this approach is examined by comparing with numerically exact benchmark results. The possible applications of proposed methods to organic crystals and oxide semiconductors are discussed[3-5].

References:

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