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On the simulation of dissipative time-dependent systems

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Recently, a DMRG-based algorithm to simulate Hamiltonian dynamics in one dimensional quantum systems has been proposed [G. Vidal, Phys. Rev. Lett. 93, 040502 (2004)]. I will discuss an extension of the algorithm to open system dynamics [M. Zwolak, G. Vidal, Phys. Rev. Lett. 93, 207205 (2004)]. This extension can be used e.g., to compute thermal states or to simulate dissipative dynamics in arbitrary one-dimensional quantum lattices, including systems of bosons and fermions and spin chains.