

Abstract for an Invited Paper
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On adaptive time-dependent DMRG based on Runge-Kutta methods

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During the past year, the density matrix renormalization group (DMRG) has experienced an unprecedented evolution. Through a convergence with quantum information ideas, it has become a simulation tool that allows one to calculate time-evolution and spectral properties of quantum systems with exceptional accuracy. We present a new real-time evolution DMRG algorithm which works on ladders and systems with interactions beyond nearest neighbors, in contrast to existing Suzuki-Trotter based approaches. We demonstrate its application on several chain and ladder systems.