

Variational matrix product operators for the steady state of dissipative quantum systems

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<http://arxiv.org/abs/1501.06786> [2]

We present a new variational method, based on the matrix product operator (MPO) ansatz, for finding the steady state of dissipative quantum chains governed by master equations of the Lindblad form. Instead of requiring an accurate representation of the system evolution until the stationary state is attained, the algorithm directly targets the final state, thus allowing for a faster convergence when the steady state is a MPO with small bond dimension. Our numerical simulations for several dissipative spin models over a wide range of parameters illustrate the performance of the method and show that indeed the stationary state is often well described by a MPO of very moderate dimensions.

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