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Estimating Evolution Time in Adiabatic Quantum Dynamics of Spin Chains

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The XXZ spin chain model is a relevant benchmark for evaluating the effectiveness of adiabatic time evolution in quantum computers. In this study, we aim to estimate the evolution time required to reach the final ground state in adiabatic quantum dynamics of spin chains through classical matrix product state simulations. We configured the initial Hamiltonian as independent XX or Heisenberg dimers and the final Hamiltonian as XX or Heisenberg chain with open boundary conditions. We employed standard trotterized real-time evolution methods using finite matrix product states.

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