

Abstract Submitted
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Excited states from variational Monte Carlo simulations with matrix-product states¹ LING WANG, Boston University, YING-JER KAO, National Taiwan University, ANDERS SANDVIK, Boston University — We report a further development [1] of a recently proposed variational Monte Carlo method for matrix-product states (MPS) [2]. Using the frustrated $J_1 - J_2$ Heisenberg chain as a test case, we show how the matrices can be optimized not just for the ground state, but also, simultaneously, for the lowest states in several different lattice and spin symmetry sectors. This is useful in, e.g., studies of quantum phase transitions associated with crossings of excited-state energies.

[1] Y.-J. Kao, L. Wang, and A. W. Sandvik (unpublished)

[2] A. W. Sandvik and G. Vidal, arXiv:0708.2232.

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Ling Wang
Boston University

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