

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Diagonalization with matrix-product states¹ CHEN LIU, ANDERS SANDVIK, Boston University — We consider matrix-product states (MPSs) combined with diagonalization as a method to study correlated quantum many-body systems. The Hamiltonian matrix is constructed in a non-orthogonal basis of MPSs. Diagonalizing this matrix (a generalized eigenvalue problem) gives the ground state as well as excitations. The accuracy is significantly improved compared to individual optimized MPSs. We discuss several ways to generate the MPS basis states in a suitable way and present results for one- and two-dimensional quantum spin systems.

¹NSF DMR-0803510

Chen Liu
Boston University

Date submitted: 18 Nov 2010

Electronic form version 1.4