

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

A new warm-up procedure for the density-matrix renormalization group MASAKI TEZUKA, Department of Physics, University of Tokyo — A density-matrix renormalization group (DMRG) calculation starts with the infinite-system algorithm (the warm-up stage), where the system size l is enlarged by adding new sites in the middle, which is then fed into the finite algorithm where the cut location is moved back and forth to enhance accuracy. Usually a considerable proportion of total calculation time has to be spent on the infinite algorithm, before the finite-size sweeps can be started. This is because at each step the target wavefunction for a different l has to be calculated by some numerical diagonalization technique, and it is more difficult to give a good initial vector than in the finite-size algorithm where l is constant. Here we propose a new infinite algorithm procedure where one value of l is used to provide several blocks with different numbers of sites, which in fact dramatically reduces the overall computational time. This is demonstrated for various models such as the Hubbard model.

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Date submitted: 19 Nov 2006

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