Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Implementing the SU(2) Symmetry for the DMRG[1] GONZALO ALVAREZ, Oak Ridge National Laboratory — In the Density Matrix Renormalization Group (DMRG) algorithm (White, 1992), Hamiltonian symmetries play an important role. Using symmetries, the matrix representation of the Hamiltonian can be blocked. Diagonalizing each matrix block is more efficient than diagonalizing the original matrix. This talk will explain how the DMRG++ code[2] has been extended to handle the non-local $SU(2)$ symmetry in a model independent way. Improvements in CPU times compared to runs with only local symmetries will be discussed for typical tight-binding models of strongly correlated electronic systems. The computational bottleneck of the algorithm, and the use of shared memory parallelization will also be addressed. Finally, a roadmap for future work on DMRG++ will be presented.

[1]Supported by the Center for Nanophase Materials Sciences, sponsored by the Scientific User Facilities Division, Basic Energy Sciences, U.S. Department of Energy, under contract with UT-Battelle.
[2]arXiv:0902.3185 or Computer Physics Communications **180** (2009) 1572-1578.

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Date submitted: 18 Nov 2009 Electronic form version 1.4