

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Quantum cellular automata and quantum simulation** PETER LOVE, Haverford College — Quantum information theory can address ground state properties through DMRG-like classical methods, and through proposals for the use of phase estimation-based quantum algorithms. However, the dynamics of quantum systems present greater challenges to both classical and quantum computational methods. Quantum cellular automata provide a simple arena in which to address questions about quantum dynamics. Prior work has yielded decision procedures to determine when the local rule leads to globally unitary dynamics. I will describe a particular class of automata, unitary by construction, and discuss their relevance to the quantum computational complexity of quantum dynamics.

Peter Love  
Haverford College

Date submitted: 20 Nov 2006

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