Abstract Submitted
for the DAMOP05 Meeting of
The American Physical Society

Time-Dependent Wavepacket Propagation using the Lie-Trotter-Suzuki Method BARRY I. SCHNEIDER, Physics Division, National Science Foundation, LEE A. COLLINS, Theoretical Division, Los Alamos National Laboratory — The Lie-Trotter-Suzuki(LTS) formulae offer an extremely efficient approach to the solution of the time-dependent Schroedinger equation. By combining finite difference or finite element discrete variable spatial discretizations with the LTS formula, we have developed a computational method, accurate up to fourth order, and have applied it to a number of interesting problems. The algorithm is explicit, unconditionally stable, scales linearly with the number of basis functions used for the spatial discretization and is easily parallelized. A number of the applications, including a model for a BEC interferometer, will be presented in the talk.

Barry I. Schneider
Physics Division, National Science Foundation

Date submitted: 11 Mar 2005 Electronic form version 1.4