

Abstract Submitted  
for the DAMOP06 Meeting of  
The American Physical Society

**A quasi-hermitian pseudo potential for higher partial-wave scattering** IRIS REICHENBACH, ANDREW SILBERFARB, University of New Mexico, RENE STOCK, University of Calgary, IVAN DEUTSCH, University of New Mexico — The dynamics of ultracold atoms in traps is an ideal platform for studies of quantum condensed matter, topological field theories, and quantum information processing. At the heart of these many-body systems are two-body interactions mediated by the molecular potentials of the respective dimer. Simultaneous treatment of the short-range molecular potential and long-range trapping potential is facilitated through the use of a pseudopotential, as seen in recent studies where s-wave scattering dominates. We extend this to higher-order partial waves, important for identical fermions and situations beyond the Wigner-threshold law. This pseudopotential is quasi-Hermitian, leading to a complete biorthonormal set of eigenfunctions. We apply this model to study trap-induced resonances occurring for colliding atoms in separated traps.

Iris Reichenbach  
University of New Mexico

Date submitted: 01 Feb 2006

Electronic form version 1.4