

Abstract Submitted
for the 4CF09 Meeting of
The American Physical Society

Calculation of Feshbach Resonances with Rb-85 Atoms Using Realistic Potentials to Constrain Separable Potentials¹ WALTER UNGLAUB, J.A. MCNEIL², Colorado School of Mines — The phenomenology of Feshbach resonances in cold quantum gases has been studied with Rb-85 atoms in the presence of an external magnetic field. For a pair of such atoms interacting with a particular magnetic field value, various separable potential models have been utilized to calculate the singlet and triplet scattering lengths and corresponding strength parameters from fitted dipole form factors. Such calculations are extended to incorporate more realistic potential models in order to constrain separable potentials applicable to the 3- body interaction. Unitary pole expansion approximations are explored in the attempt to extract the particular atomic states contributing to the Feshbach resonance from spectral decompositions of such realistic potentials. A full 2-body calculation of Rb-85 atoms is to be presented in position- space, from which 3-body calculations in momentum-space can be done in order to study the phenomenon of 3-body recombination and breakup processes in cold quantum gases.

¹Colorado School of Mines

²Research Advisor

Walter Unglaub
Colorado School of Mines

Date submitted: 24 Sep 2009

Electronic form version 1.4