

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Fully converged iterative method for coupled channel problems<sup>1</sup>**

DI SHU, I. SIMBOTIN, R. CÔTÉ, Univ of Connecticut - Storrs — We implemented a numerical method using a distorted-wave perturbative approach for coupled-channel scattering problems. Our new method provides a way to avoid costly computations for the propagation of the full solutions in coupled-channel problems to large distances for slowly vanishing couplings. Thus, instead of dealing with large matrices, all computations are performed in a channel by channel fashion. The distorted wavefunction for each channel is initialized with the appropriate solution (which includes the diagonal element of the coupling potential matrix). We then solve single-channel inhomogeneous radial equations which contain the (off-diagonal) couplings as a perturbation, and we iterate until desired accuracy is achieved. We tested for stability by continuing to iterate even after convergence has been achieved, e.g., for a total of 75 iterations.

<sup>1</sup>Partial support from the US Army Research Office (ARO-MURI W911NF-14-1-0378), and from NSF (Grant No. PHY-1415560).

Di Shu  
Univ of Connecticut - Storrs

Date submitted: 28 Jan 2016

Electronic form version 1.4