Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Towards Quantum Simulation of Chemical Dynamics with Prethreshold Superconducting Qubits A.W. COOK, P.C. STANCIL, M. GELLER, HAO YOU, UGA, A.T. SORNBORGER, UC Davis — While large-scale, fault-tolerant quantum computing devices are still on the horizon, considerable activity has focused on quantum simulation (qs). While advances have been made in realizing both digital and analog qs, the former is still restricted by the need for fault-tolerant computational qubits. As an alternative, we are exploring the single excitation subspace (ses) approach which has the advantage of using today's prethreshold devices and can function as a schroedinger equation solver. One application of the ses method is the study of molecular collision problems. we are both developing efficient, optimized scattering approaches on classical computers and porting the method to an ses processor focusing on superconducting architectures. Issues related to propagator efficiency, multichannel potential averaging, and ehrenfest symmetrization have been explored. Results from classical calculations and simulations of qs for ion-atom collisions will be presented.

P.C. Stancil
UGA

Date submitted: 07 Dec 2015 Electronic form version 1.4