Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

p-wave Feshbach resonances and three-body losses in quasi-1D spin-polarized ^{6}Li gases[1] RUWAN SENARATNE, YA-TING CHANG, DANYEL CAVAZOS-CAVAZOS, RANDALL HULET, Rice University — p-wave Feshbach resonances in ultracold Fermi gases present an opportunity to observe p-wave pairing and non-trivial topological states, such as Majorana edge modes. However, the enhanced losses near such resonances have prevented such investigation. A reduction in the three-body losses in a spin-polarized gas of ^{6}Li atoms in the lowest-energy spin state near the p-wave Feshbach resonance at approximately 159 G is expected when confined to quasi-1D. We present measurements of these three-body losses in quasi-1D tubes as functions of confinement, temperature and magnetic detuning from this resonance, as well as the results of coupled-channel calculations of the p-wave scattering amplitude under these conditions. We also report on the prospect of observing p-wave pairing in this system, and present an experimental set-up using a digital micromirror device (DMD) and blue-detuned light to produce the hard boundaries necessary to simulate the Kitaev chain hamiltonian and observe Majorana edge modes.

[1]Work supported by an ARO MURI grant, ONR, NSF, and the Welch Foundation

Ruwan Senaratne
Rice University

Date submitted: 01 Feb 2019 Electronic form version 1.4