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 pair-
ing 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 us-
ing a digital micromirror device (DMD) and blue-detuned light to produce the hard
boundaries necessary to simulate the Kitaev chain hamiltonian and observe Majo-
rana edge modes.

$^1$Work supported by an ARO MURI grant, ONR, NSF, and the Welch Foundation

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Date submitted: 01 Feb 2019

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