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Suppression of three-body loss of p-wave fermions in quasi-1D[1] YA-TING CHANG, RUWAN SENARATNE, DANYEL CAVAZOS-CAVAZOS, RANDALL G. HULET, Department of Physics and Astronomy, Rice University, Houston TX — Recent interest in quantum computing has brought attention to the study of p-wave interactions, which are known to result in intriguing quantum phenomena such as $p + ip$ topological superfluids and Majorana fermions. However, the exploration of these phenomena in ultracold atomic gases has been impeded due to the severe atom losses from three-body recombination collisions near the p-wave Feshbach resonance in a 3D atomic gas. Previous work predicted[2] that such severe losses could be suppressed in quasi-1D. If proven true, this could open a possible avenue for realizing the Kitaev chain model. We characterized the three-body loss in quasi-1D using spin-polarized ^{6}Li atoms in a two-dimensional optical lattice. We measured a reduction in the three-body loss coefficient as a function of lattice depth. The confinement induced shift and the shape of the resonance feature are consistent with coupled channels calculations for p-wave scattering in quasi-1D.

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[2]Lihong Zhou and Xiaoling Cui, Phys. Rev. A 96, 030701 (2017).

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