

Abstract Submitted  
for the DAMOP19 Meeting of  
The American Physical Society

**A Bose-Einstein condensate in a lattice produced by simultaneous Raman and RF coupling**<sup>1</sup> SEAN MOSSMAN, THOMAS BERSANO, PETER ENGELS, Washington State University — Experiments with ultracold atoms allow for the generation of unique lattice structures probing advanced concepts from condensed matter and fundamental physics. Here, we experimentally demonstrate a spin-dependent, Galilean invariant lattice which emerges from the simultaneous application of Raman dressing and RF coupling. The Raman dressing explicitly breaks Galilean symmetry and produces linear spin-orbit coupling. When the RF coupling is added, Galilean symmetry is restored and a lattice structure emerges. With time-of-flight observations, we demonstrate key features of this novel lattice.

<sup>1</sup>Support by the NSF is gratefully acknowledged

Sean Mossman  
Washington State University

Date submitted: 01 Feb 2019

Electronic form version 1.4