

Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Vortex formation in spin-orbit coupled Bose condensates TARAS HRUSHEVSKYI, ANINDYA RASTOGI, ERHAN SAGLAM YUREK, LINDSAY LEBLANC, University of Alberta — Using recently developed Raman-beam techniques, artificial spin-orbit coupling can be realized in an ultracold gas. Here, we study the formation of vortices in a BEC subjected to a spatially-dependent spin-orbit coupling that, in some regimes, acts to provide oppositely directed artificial magnetic fields for two different spin states [1,2]. We numerically investigate the formation of these vortices to understand the interplay between trap configuration, spin-orbit coupling parameter, and interactions (both spin-dependent and -independent). Finally, we discuss our progress towards the experimental realization of this system in our laboratory using an ultracold gas of ^{87}Rb atoms in a new apparatus. [1] C. Wang, et al. Phys. Rev. Lett. 105, 160403 (2010). [2] J. Radic, et al. Phys. Rev. A 84, 063604 (2011).

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Date submitted: 29 Jan 2016

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