Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Long-lived two-domain spin structures in a non-degenerate gas SEAN GRAHAM, DORNA NIROOMAND, Simon Fraser University, ROBERT RAGAN, University of Wisconsin - La Crosse, JEFFREY MCGUIRK, Simon Fraser University — We demonstrate that linear differential potentials give rise to long-lived longitudinal spin domains with decoupled transverse and longitudinal spin dynamics. At ultra-cold temperatures, coherent spin-rotating interactions lengthen the diffusion time of spin domains in non-degenerate gases. The spin dynamics are further altered by applying linear differential potentials of varying gradients. At specific gradients, we observe stable spin domains for a range of densities and temperature. In the hydrodynamic limit, the measured optimal gradients agree well with a quantum Boltzmann theory.

Sean Graham
Simon Fraser University

Date submitted: 26 Jan 2018 Electronic form version 1.4