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**Stability of spin domains in a nondegenerate gas** JEFFREY MCGUIRK, Simon Fraser University, SEAN GRAHAM, University of Stuttgart, MEHDI POURZAND, LINDSAY BABCOCK, Simon Fraser University — We study the spin dynamics of a weakly interacting non-degenerate Bose gas. Microscopic exchange scattering in binary collisions between indistinguishable atoms in a gas just above quantum degeneracy can lead to macroscopic collective behavior. Additional application of a weak, spatially inhomogeneous, spin-dependent optical potential (effective magnetic field) can dramatically modify the spin dynamics driven by exchange effects, and, for example, lead to long-lived domain states. We present experimental studies of the nature of these stable spin domains in a magnetically-trapped  $^{87}\text{Rb}$  gas, and explore the effect of domain wall size and effective magnetic field geometry on the stability and lifetime of spin domains. Results are compared to a hydrodynamic Boltzmann approximation.

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