Contribution ID: **986** Type: **Invited Speaker / Conférencier invité**

Nonclassical diffusion in a nondegenerate ultracold gas

Wednesday 15 June 2016 15:30 (30 minutes)

We study the crossover from classical to quantum diffusion by studying the equilibration of longitudinal spin domains in a trapped 87Rb sample just above quantum degeneracy. By controlling the degree of spin coherence in the domain wall, we can dramatically alter the relaxation dynamics of the system. Coherence in the domain wall leads to transverse-spin-mediated longitudinal spin diffusion that is slower than classical predictions, as well as altering the domains' oscillation frequency. We also investigate an instability in the longitudinal spin dynamics as the longitudinal and transverse spin components couple, and a conversion of longitudinal spin to transverse spin is observed, leading to longer lived coherent spin oscillations.

Author: MCGUIRK, Jeffrey (Simon Fraser University)

Presenter: MCGUIRK, Jeffrey (Simon Fraser University)

Session Classification: W3-6 Cold and Trapped Atoms, Molecules and Ions (DAMOPC) / Atomes, molécules et ions froids et piégés (DPAMPC)

Track Classification: Division of Atomic, Molecular and Optical Physics, Canada / Division de la physique atomique, moléculaire et photonique, Canada (DAMOPC-DPAMPC)