

Abstract Submitted  
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**Instabilities dynamics in an ultra-cold Bose gas** DORNA NI-ROOMAND, LYDIA ZAJICZEK, JEFFREY MCGUIRK, Simon Fraser University  
— The presence of a spin discontinuity in an ultra-cold gas has a dramatic effect on the dynamics of the system. In particular, the sudden reversal of spin across a domain wall can cause even the smallest spin perturbations to grow into macroscopic coherent oscillations. We report progress towards realizing such an instability in a magnetically trapped gas of  $^{87}\text{Rb}$  atoms. Using optical patterning techniques, we create a sharp spin gradient in a gas just above quantum degeneracy. We observe instability-induced rapid and sudden spin inversions and characterize their time scales.

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