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Quantum dynamics in a trapped ultra-cold Bose gas DORNA NIROOMAND, LYDIA ZAJICZEK, JEFFREY MCGUIRK, Simon Fraser University — We study spin dynamics in a trapped Rb gas near quantum degeneracy. Although the system is not degenerate, the dynamics are dominated by quantum properties of particles. We use an optical technique, based on the ac Stark effect, to imprint desired spin structures in these trapped atomic samples. These spin structures can lead to generation of instabilities, such as the Castaing instability, in which a strong longitudinal spin gradient is unstable to transverse perturbations. We report experimental results on observing the Castaing instability.

Dorna Niroomand
Simon Fraser University

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