

Abstract Submitted
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The onset of superfluid turbulence in Bose-Einstein condensates¹

TYLER NEELY, EDWARD SAMSON, University of Arizona, ASHTON BRADLEY, University of Otago, MATTHEW DAVIS, University of Queensland, BRIAN ANDERSON, University of Arizona — We explore the onset of superfluid turbulence in Bose-Einstein condensates held in highly oblate traps. In our procedure, highly oblate BECs are first created in a combined optical and magnetic trap with an approximately 11:1 aspect ratio. We then modulate the the harmonic trapping frequency, introducing vortices and turbulence into the trapped gas. We explore the onset of superfluid turbulence in BECs held in both harmonic and multiply connected potential wells, comparing the characteristics of turbulence in both traps. By studying various excitation methods and re-thermalization of the gases as well as comparisons between experimental and numerical results, transitions to turbulence of ultra-cold trapped gases can be quantitatively characterized.

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