

Abstract Submitted
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Spontaneous vortices in Bose-Einstein condensate formation: comparison of experiment and theory TYLER NEELY, CHAD WEILER, DAVID SCHERER, College of Optical Sciences, University of Arizona, ASHTON BRADLEY, MATTHEW DAVIS, School of Physical Sciences, University of Queensland, BRIAN P. ANDERSON, College of Optical Sciences, University of Arizona — By evaporative cooling of an atomic gas through the Bose-Einstein condensation transition, we have experimentally observed and characterized the spontaneous creation of vortices in BECs during the transition. We have also observed spontaneous formation of vortices in BECs through numerical simulations of the BEC transition using theoretical methods based on the Stochastic Gross-Pitaevskii equation formalism. Our experimental and theoretical results show excellent quantitative agreement. Furthermore, our results are qualitatively consistent with the Kibble-Zurek mechanism for topological defect formation in a phase transition. A quantitative comparison of our experimental and numerical observations will be presented.

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