

Abstract Submitted
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Observation of hysteresis in a superfluid Bose-Einstein condensate with a weak link S. ECKEL, J.G. LEE, K.C. WRIGHT, W.D. PHILLIPS, Joint Quantum Institute, NIST, University of Maryland, C.J. LOBB, University of Maryland, Department of Physics, G.K. CAMPBELL, Joint Quantum Institute, NIST, University of Maryland — Hysteresis is a common feature of superfluid and superconducting systems with Josephson junctions. We have observed hysteresis in the persistent current state of a toroidally-shaped, Bose-Einstein condensate, stirred with a rotating barrier potential. The barrier, which is modeled as a weak link, induces phase slips in the superfluid between well-defined persistent current states. The rotation frequency at which these phase slips occur differ, depending on whether the phase slip results in an increase or decrease of the persistent current. Such behavior in a toroidal BEC is analogous to an RF SQUID, allowing this device to possibly be used as a sensitive rotation sensor.

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