

Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Experiments with Superfluid Atom Circuits¹ AVINASH KUMAR, JEFFERY LEE, STEPHEN ECKEL, FRED JENDRZEJEWSKI, CHRISTOPHER LOBB, WILLIAM PHILLIPS, GRETCHEN CAMPBELL, JQI, University of Maryland & NIST — We trap a neutral ^{23}Na BEC in an all optical toroidal potential, and mechanically impart angular momentum to the BEC to obtain superfluid currents. The experiments done in our group have demonstrated the existence of persistent quantized currents and studied the behavior of the currents in the presence of “a weak link barrier.” Just as RF SQUIDS are used to detect magnetic fields, our setup could be used to detect small changes in rotation in an analogous way. We will report on our recent results, including the demonstration of hysteretic behavior and attempts to measure the current-phase relationship of the “weak link barrier.”

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Date submitted: 25 Jan 2013

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