

Abstract Submitted
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A circular dual BEC interferometer gyroscope VANESSA LEUNG, JOHN BURKE, ROBERT HORNE, ROBERT LEONARD, CHARLES SACKETT, Department of Physics, University of Virginia, Charlottesville, Virginia 22904 — Recently, gyroscopes based on ring-shaped condensate interferometers have been proposed [1]. They offer the advantages of long interaction times within confined physical dimensions. Phase errors can arise, however, from the technical difficulty of controlling noise effects such as mechanical vibrations, trap potential fluctuations, and initial condensate motion. To deal with these problems, we propose a gyroscope based on two dual interferometers consisting of condensates moving in a near-circular trajectory through a common harmonic potential. We show that in such a system, many sources of phase noise cancel to high order, with the primary limitation expected to be from residual asymmetry in the trapping potential. We will present theoretical results for noise sensitivity and our experimental progress towards implementing such a system.

[1] Burke, J. H. T. and C. A. Sackett, “Scalable Bose-condensate Sagnac interferometer in a linear trap.” *Phys. Rev. A* **80** 061603(R) (2009) and references therein.

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