Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Design and construction of condensate interferometers for inertial navigation applications ROBERT HORNE, JOHN BURKE, JIRAPHAT TIAMSUPHAT, VANESSA LEUNG, CASS SACKETT, Department of Physics, University of Virginia, Charlottesville, Virginia 22904 — Atom interferometry using Bose-Einstein condensates has the potential to be useful for applications in inertial navigation. However, although condensate interferometers have already been demonstrated [1,2] to be feasible as navigation devices, their sensitivity must be improved by increasing their measurement time and arm separation. In previous work we have shown that the sensitivity of interferometers based on atoms confined in a magnetic waveguide are currently limited by residual magnetic field variation along the axis of the guide. We are implementing a linear guide in which such variations are reduced and overall vibration and field stabilization improved. Furthermore, we have also begun constructing a new apparatus in which our design has been extended to a ring configuration. This would enable high-sensitivity gyroscopic measurements of rotation. In our poster we will present our latest results on both interferometers. [1] Y.J. Wang *et al.*, "Atom Michelson interferometer on a chip using a Bose-Einstein condensate.", *Phys. Rev. Lett.* **94** 090405 (2005). [2] O. Garcia *et al.*, "Bose-Einstein condensate interferometer with macroscopic arm separation.", *Phys. Rev. A* **74** 031601(R) (2006).

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Date submitted: 23 Jan 2009 Electronic form version 1.4