Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Decoherence-free subspaces in BEC interferometry[1] CHARLES W. CLARK, Joint Quantum Institute, NIST and University of Maryland, MARK EDWARDS, Georgia Southern University and NIST, JEFFREY HEWARD, Georgia Southern University — We extend an approach originally developed to describe Bragg interferometry of Bose-Einstein condensates [1], to describe new interferometers based on quantum information concepts. This approach follows ideas recently introduced in neutron interferometry, such as the identification of decoherence free (DF) subspaces to reduce mechanical noise [2,3]. Using techniques that have been well calibrated by experiments in conventional BEC interferometry [1], we prototype extensions to standard Mach-Zehnder configurations, analogous to the four- and five-blade DF designs of neutron interferometry [2,3].

[1] J. E. Simsarian, *et al.*, *Phys. Rev. Lett.* **85**, 2040 (2000)
[2] D. A. Pushin, M. Arif, and D. G. Cory, *Phys. Rev. A* **79**, 053635, (2009)
[3] "A vibrational decoupled neutron interferometer," D. A. Pushin, *et al.* (preprint)

[1]Supported by the National Science Foundation under grants PHY-0758111 and PHY-0822671

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Date submitted: 18 Nov 2009 Electronic form version 1.4