

Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Optical vortices for angular diffraction of atoms YISA RUMALA, Applied Physics program, University of Michigan, Ann Arbor, CHARLES SIEDLECKI, Department of Physics, University of Michigan, Ann Arbor, AARON LEANHARDT, Applied Physics program, and Department of Physics, University of Michigan, Ann Arbor — We interfere co-propagating, counter rotating optical vortices [1] in a modified Mach-Zehnder interferometer, and perform a detailed analysis of the interferometer as well as the transverse spatial mode profile. The imaging resolution and azimuthal fringe visibility of the interference pattern are experimentally and theoretically deduced. The angular variation of the transverse optical mode profile can be used as a Kapitza-Dirac phase grating to diffract atoms into different external angular momentum states, which may open up new possibilities for rotation sensing in ultra-cold atomic gases.

[1] J. Leach et al, Phys Rev Lett, 88, 257901 (2002)

Yisa Rumala
Applied Physics program, University of Michigan, Ann Arbor

Date submitted: 19 Jan 2010

Electronic form version 1.4