

Abstract Submitted  
for the DAMOP10 Meeting of  
The American Physical Society

**Excitation of the  $TE_{01}$  hollow metal waveguide mode for atom guiding** FREDRIK FATEMI, MARK BASHKANSKY, DOEWON PARK, EUNKEU OH, Naval Research Laboratory — We demonstrate excitation of the azimuthally-polarized  $TE_{01}$  cylindrical waveguide mode in hollow glass and metal waveguides with 780 nm light. We describe stable and efficient techniques for mode conversion of an incident Gaussian beam to a vectorial vortex beam, and measure attenuation lengths of the  $TE_{01}$  mode in hollow optical fibers with diameters of 50-100  $\mu\text{m}$ . By silver-coating the inner walls of the dielectric fibers, we demonstrate a  $\sim 200\%$  increase in the attenuation length. We discuss progress in implementing these fibers into a cold atom system.

Fredrik Fatemi  
Naval Research Laboratory

Date submitted: 22 Jan 2010

Electronic form version 1.4