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Atom guidance in the TE_{01} donut mode of a large-core hollow fiber[1] J.A. PECHKIS, F.K. FATEMI, Naval Research Laboratory, 4555 Overlook Avenue S.W., Washington, DC 20375 — We report on our progress towards low-light-level nonlinear optics experiments by optically guiding atoms in the TE_{01} donut mode of a hollow fiber. Atoms are transported over 12 cm from a "source" magneto-optical trap (MOT) through a 100-μm-diameter hollow fiber and are recaptured by a "collection" MOT situated directly below the fiber. For red-detuned guiding, we compare the guiding efficiency between the fundamental (Gaussian-like) mode and this donut mode, which has a larger guiding area but lower peak intensity. We also discuss our progress in transporting atoms in the dark core of this mode using blue-detuned light, which has more stringent constraints to atom guidance compared to red-detuned light.

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