

Abstract Submitted
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Ionization of Xe using Femtosecond Optical Vortices¹ JAMES STROHABER, IGOR MARIYENKO, CORNELIS UITERWAAL, Univ. Nebraska - Lincoln — Photons in optical vortices possess optical *orbital* angular momentum². What role this quantity plays in ultrafast intense-field processes is to the best of our knowledge experimentally unexplored territory. Using home-made laser-etched line holograms (with about 10 grooves per mm), we have recently created femtosecond optical vortices that are sufficiently intense to ionize Xe atoms. The simplest vortices we create are Laguerre-Gaussian modes with radial mode number $p = 0$ and azimuthal mode number $l = 1$ (a.k.a ‘donut mode’). In 2005, we were the first to report the generation of a (weaker) pure femtosecond vortex.³ Using our time-of-flight ion mass spectrometer with confined detection volume we plan to spatially image ion clouds generated by focused vortices. Recent progress will be discussed. Refs: ²Allen L *et al.* 2003 *Optical Angular Momentum* (Bristol: IoP Publ.); ³Mariyenko I *et al.* 2005 *Opt. Expr.* **13** 7599.

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