

Abstract Submitted
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Fraunhofer Diffraction of Laguerre-Gaussian Vortex (LGV) Beams Carrying Equal and Opposite Angular Momentum¹ SOPHIA ANDALORO, Univ of Dallas — Lasers ordinarily produce Hermite-Gaussian (HG) beams. These beams can be transformed to LGV beams using an astigmatic mode converter. LGV beams carry an intrinsic orbital angular momentum of $l\hbar$ per photon, where l is an integer. On reflection, the beam retains the magnitude of angular momentum but reverses its sense of rotation. Like plane waves (PW), LGV beams can be diffracted through different apertures. The results of Fraunhofer diffraction of LGV beams diffracted through equilateral triangle, square and regular pentagonal apertures are expected to reveal features not encountered in the diffraction of PW. The experiment studied the relation between diffraction of LGV beams of opposite angular momentum indices. LGV beams with $l = 1-3$ were diffracted by triangular, square and pentagonal apertures. Experimental results confirm the theory of Fraunhofer diffraction for LGV beams. For apertures without a center of inversion, the Fraunhofer diffraction pattern does not have a center of inversion. Diffraction patterns of LGV beams of equal and opposite angular momentum indices are related by a rotation of 180.

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