

Laguerre-Gaussian Beam Mode Purity

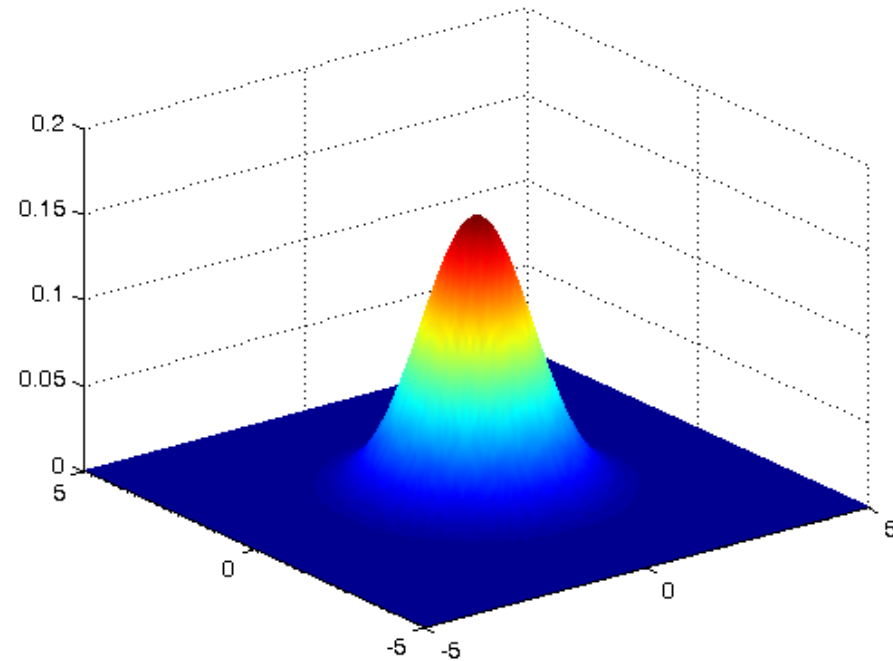
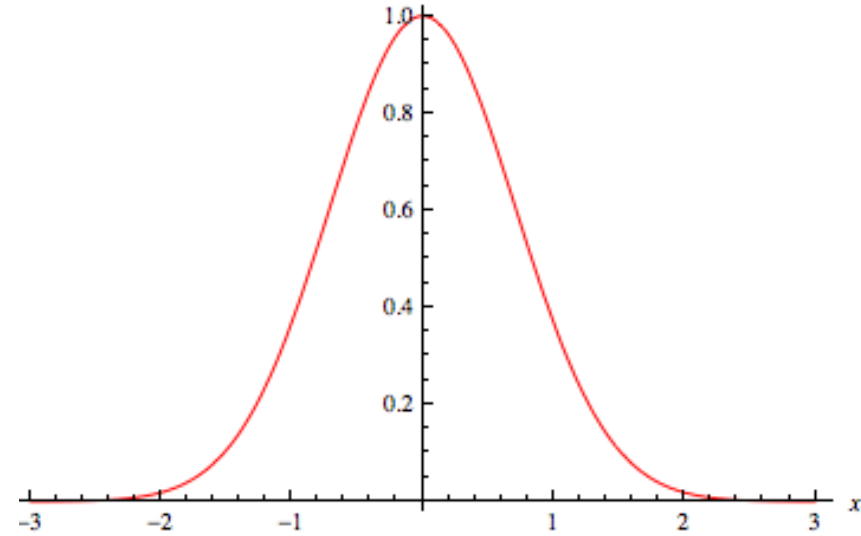
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Experimental AMO

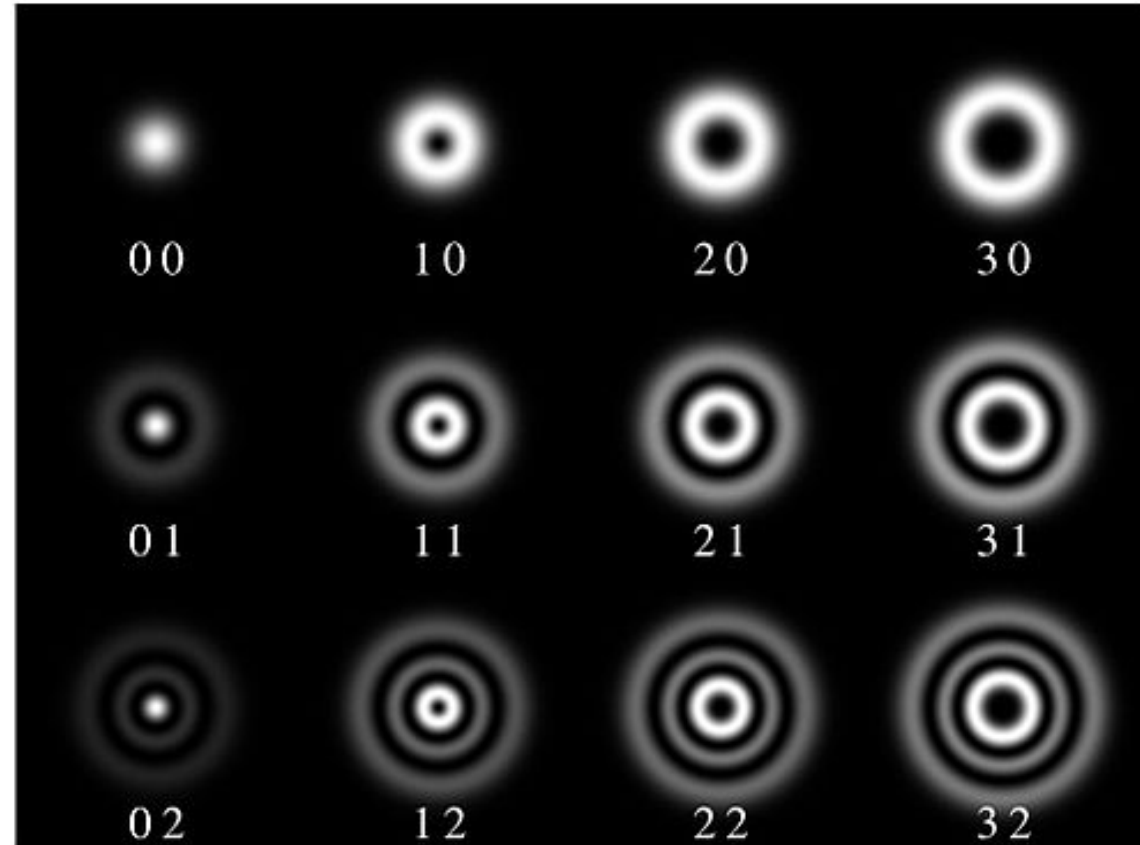
Gaussian Beam

- Electromagnetic radiation
- Modeled by Gaussian function
 - Intensity vs. radius

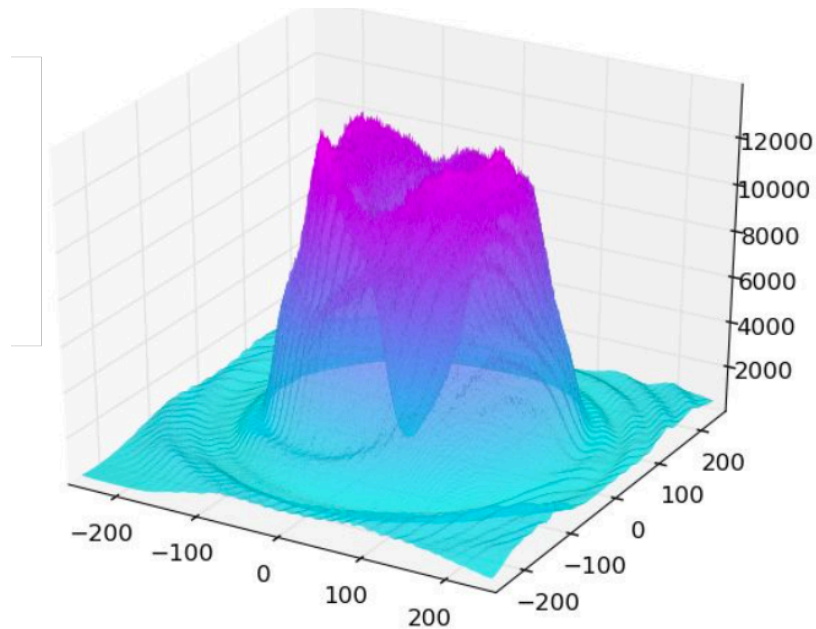
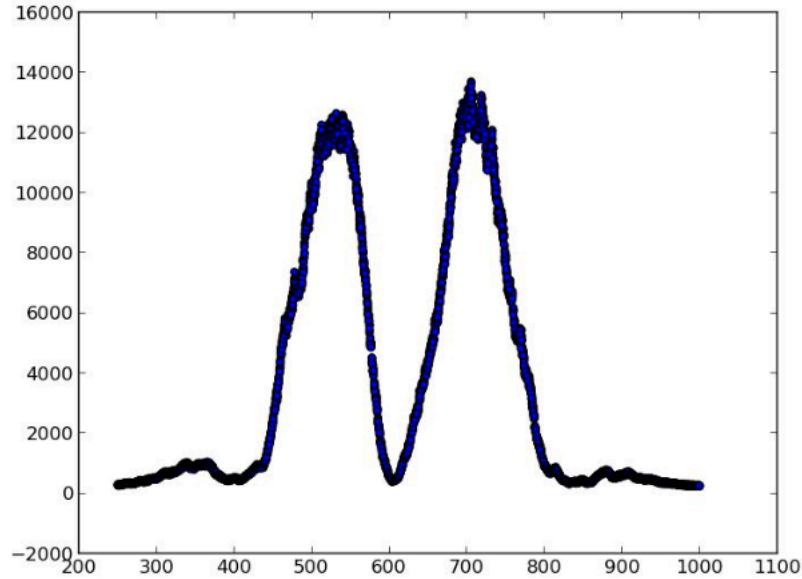
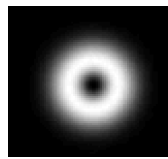


Laguerre-Gaussian (LG) Beams

- Higher-order modes of Gaussian
 - Modeled by Laguerre polynomial
 - Many different modes
- Diffractive optics
- LG_p^l or LG l-p



LG 1-0 beam profile:



Maximizing the Purity

- Maximize purity
 - Produce best profile
- Camera takes pictures of beam
- Power varies at different distances
- Calculate power as a function of propagation distance
- Maximize purity of beam at specific propagation distance

Applications

- Optical tweezers
 - Where intensity is maximized
- Atmospheric sensing
 - Laser pulses - storm detection
- Optical computers
 - Photons produced by lasers instead of electric current

Questions?