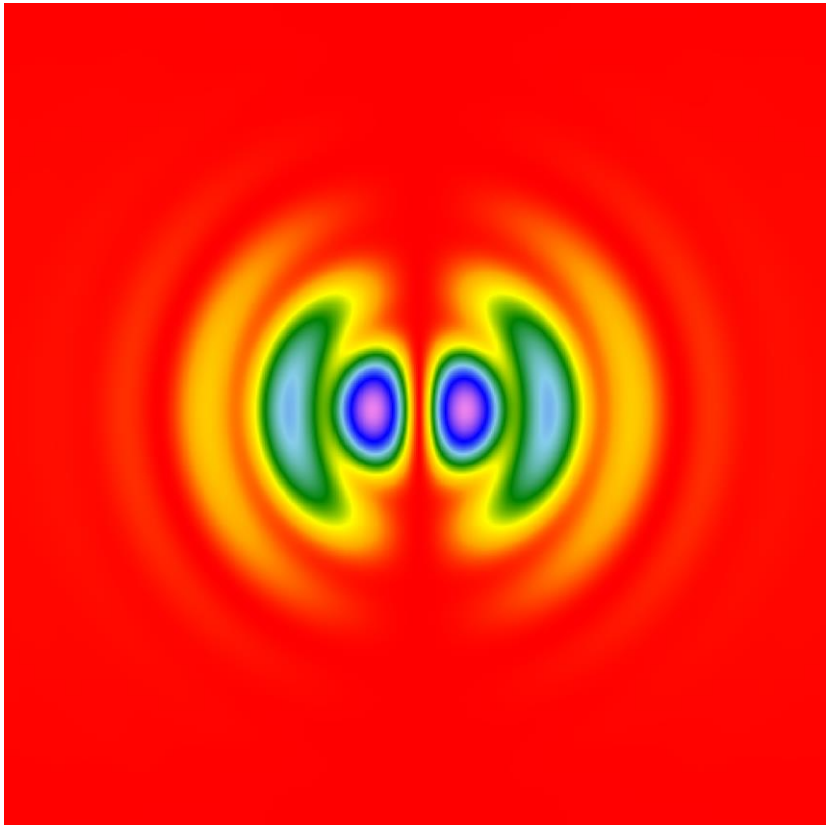
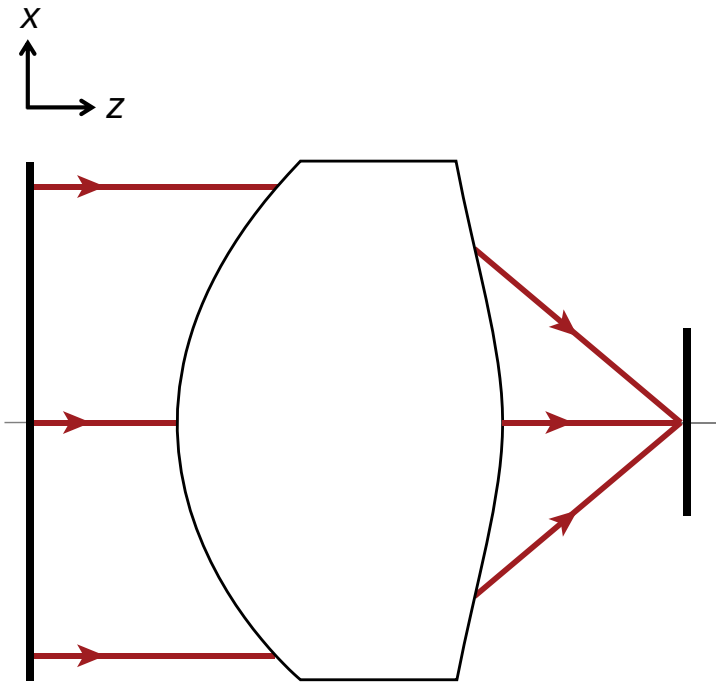
Simulation of Laser Beam in Focal Region of High-NA Asphere

Abstract



In high-NA focusing situations, the vectorial nature of light plays a non-negligible role. To demonstrate such effects, a high-NA aspherical lens is employed to focus a collimated linearly polarized Gaussian beam, and the asymmetry of the focal spot is investigated. By examining the electromagnetic field components in the focal plane, it can be found that the asymmetry is caused by a relatively strong E_z component.

Modeling Task



input field

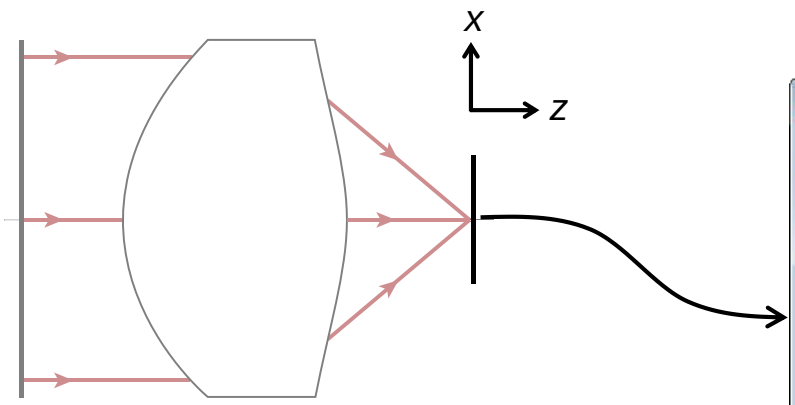
- fundamental Gaussian
  - wavelength 600 nm
- diameter (waist) 2.5 mm
  - linearly polarizer in *x* direction

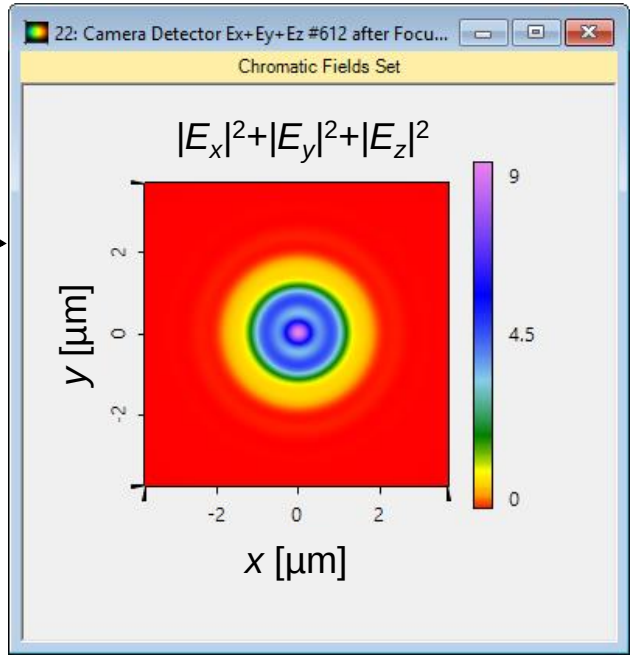
aspherical lens
(NA = 0.59)

?

field in focus

Results

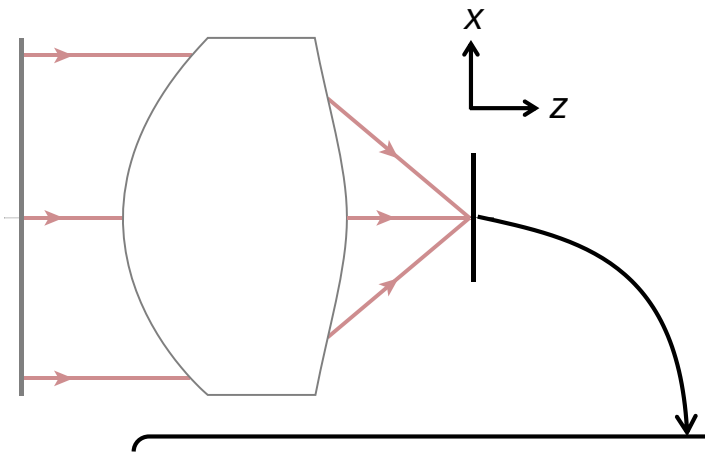


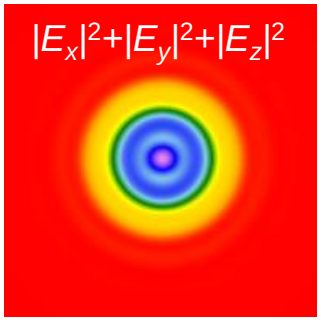


FWHM in *x*	776 nm
FWHM in *y*	679 nm

Asymmetry of focal spot can be measured.

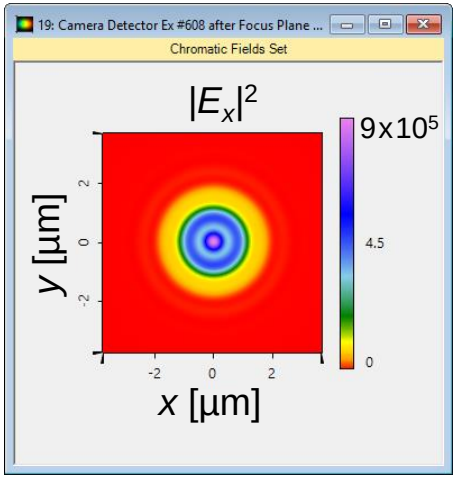
Results

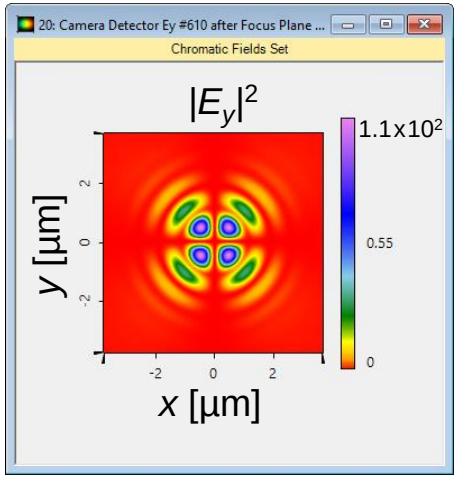


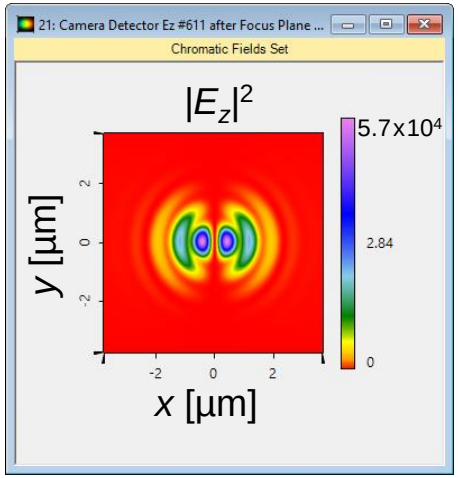


FWHM in x	776 nm
FWHM in y	679 nm

Asymmetry in focal spot is because of relatively strong E_z component.







Document Information

title	Simulation of Laser Beam in Focal Region of High-NA Asphere
version	1.0
VL version used for simulations	7.3.1.5
category	Application Use Case