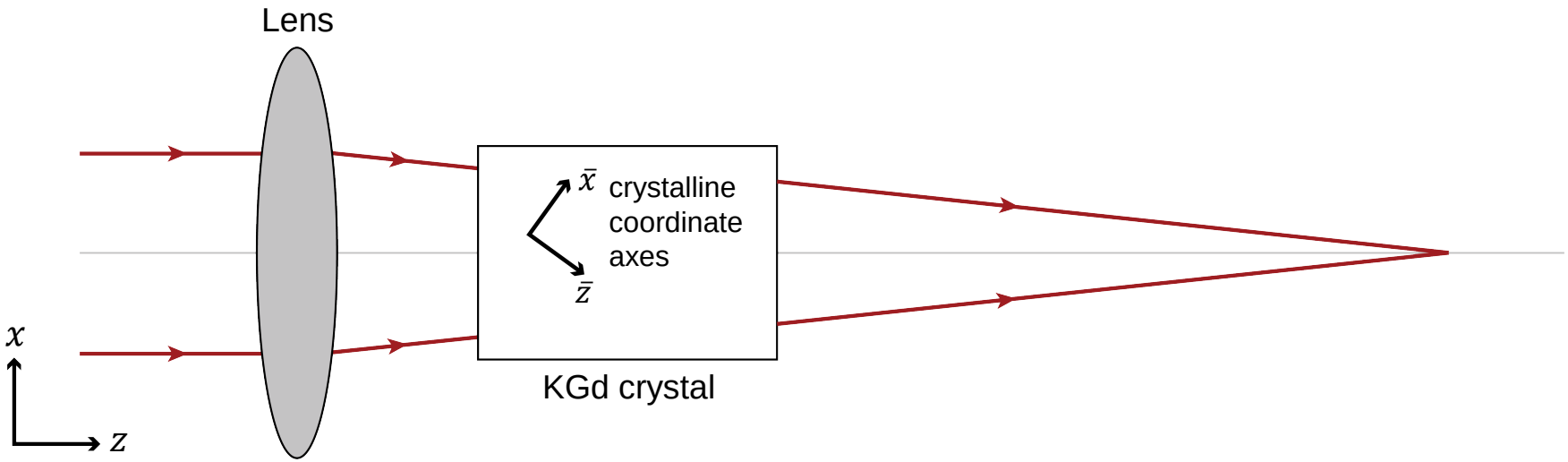
LightTrans

Laser Systems > Crystal Modeling

Conical Refraction in Biaxial Crystals

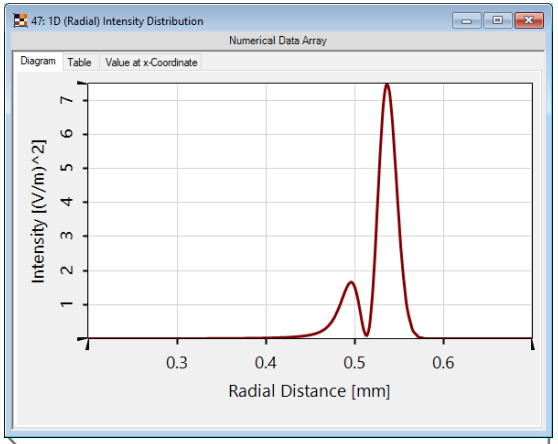
Task/System Illustration

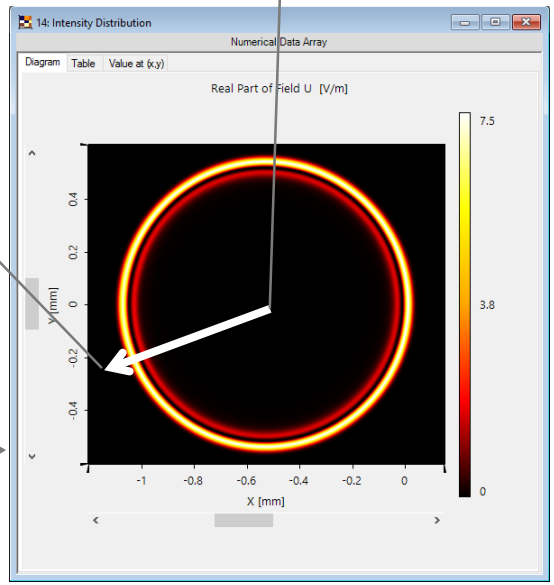


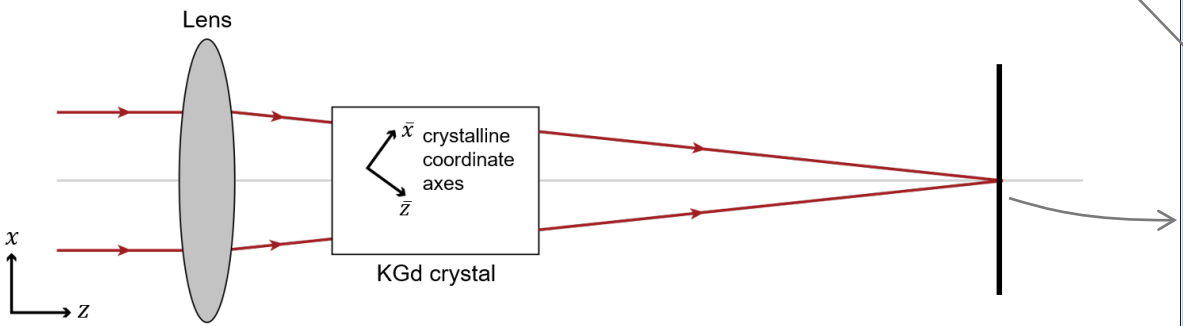
analysis of conical refraction whena circularly polarized beam propagates through a biaxial crystal along its optical axis

Highlights

- conical refraction effect
- handling of biaxial crystal (arbitrary orientation)



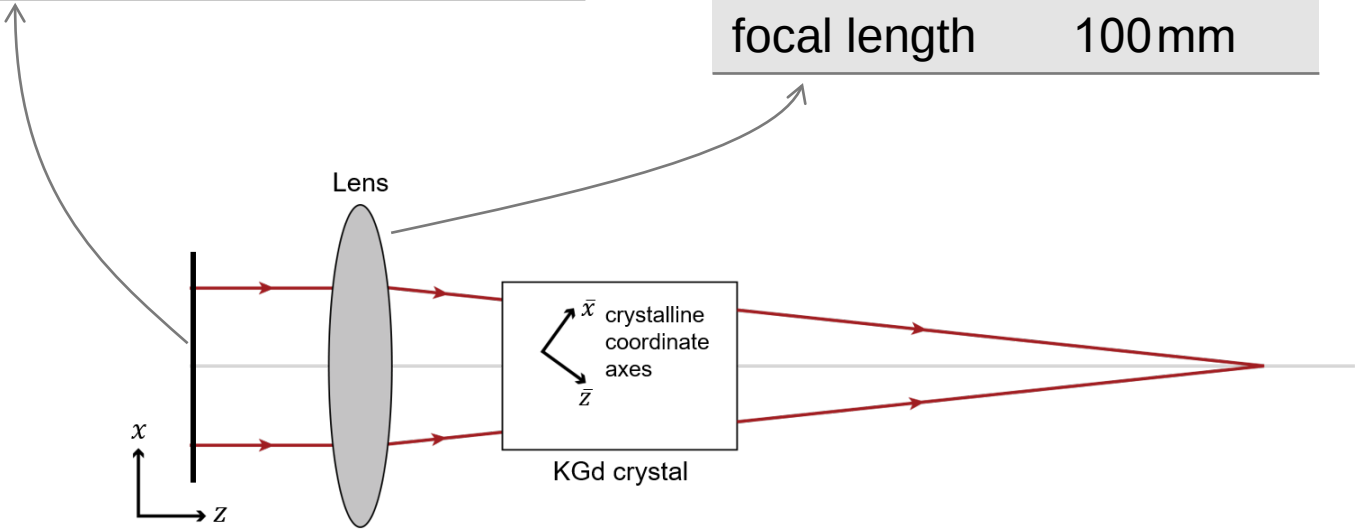




Specification: Light Source & Lens

Input laser beam	
wavelength	633 nm
mode	Hermite (0, 0)
waist radius	0.8 mm × 0.8 mm
polarization	circular (right)

Lens #1	
focal length	100 mm



Specification: Crystal

Highlights

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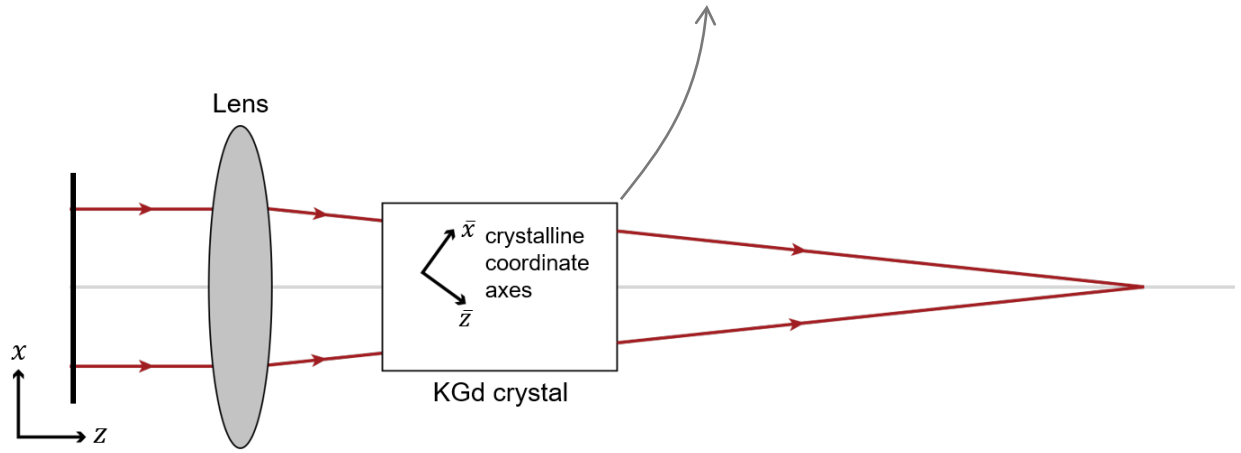
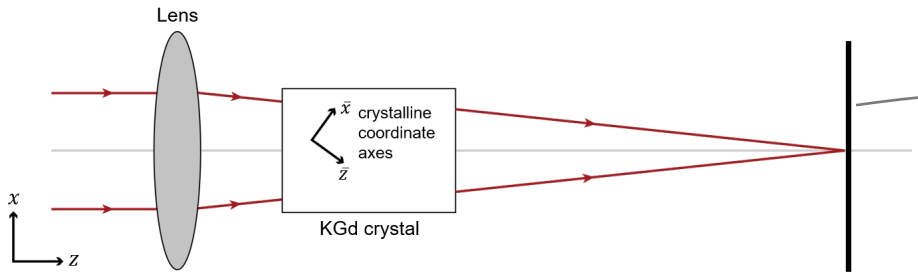
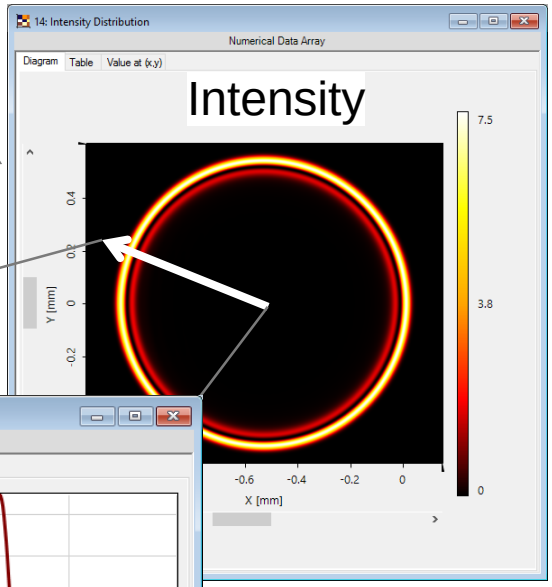
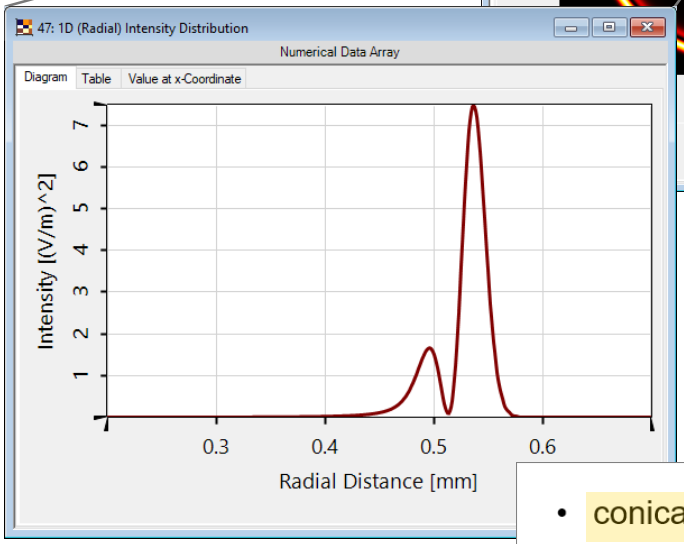
KGd crystal	
crystalline coordinate axes	$\bar{x} = (0.74, 0, 0.67)$ $\bar{y} = (0, 1, 0)$ $\bar{z} = (-0.67, 0, 0.74)$
refractive indices (@ 633nm)	$n_1 = 1.6558$ $n_2 = 1.4852$ $n_3 = 1.4852$



Results







VirtualLab simulation

Experimental measurements

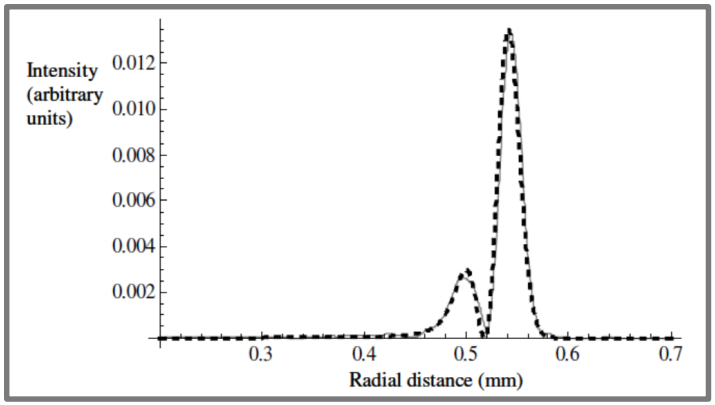


Figure from C. F. Phelan *et al.*, Opt. Express **17**, 12891-12899 (2009)

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Document & Technical Info

code	CM.0001
version of document	1.0
title	Conical Refraction in Biaxial Crystals
category	Laser Systems > Crystal Modeling (CM)
author	Site Zhang (LightTrans)
used VL version	7.0.0.29

Specifications of PC Used for Simulation	
Processor	i7-4910MQ (4 CPU cores)
RAM	32 GB
Operating System	Windows 10