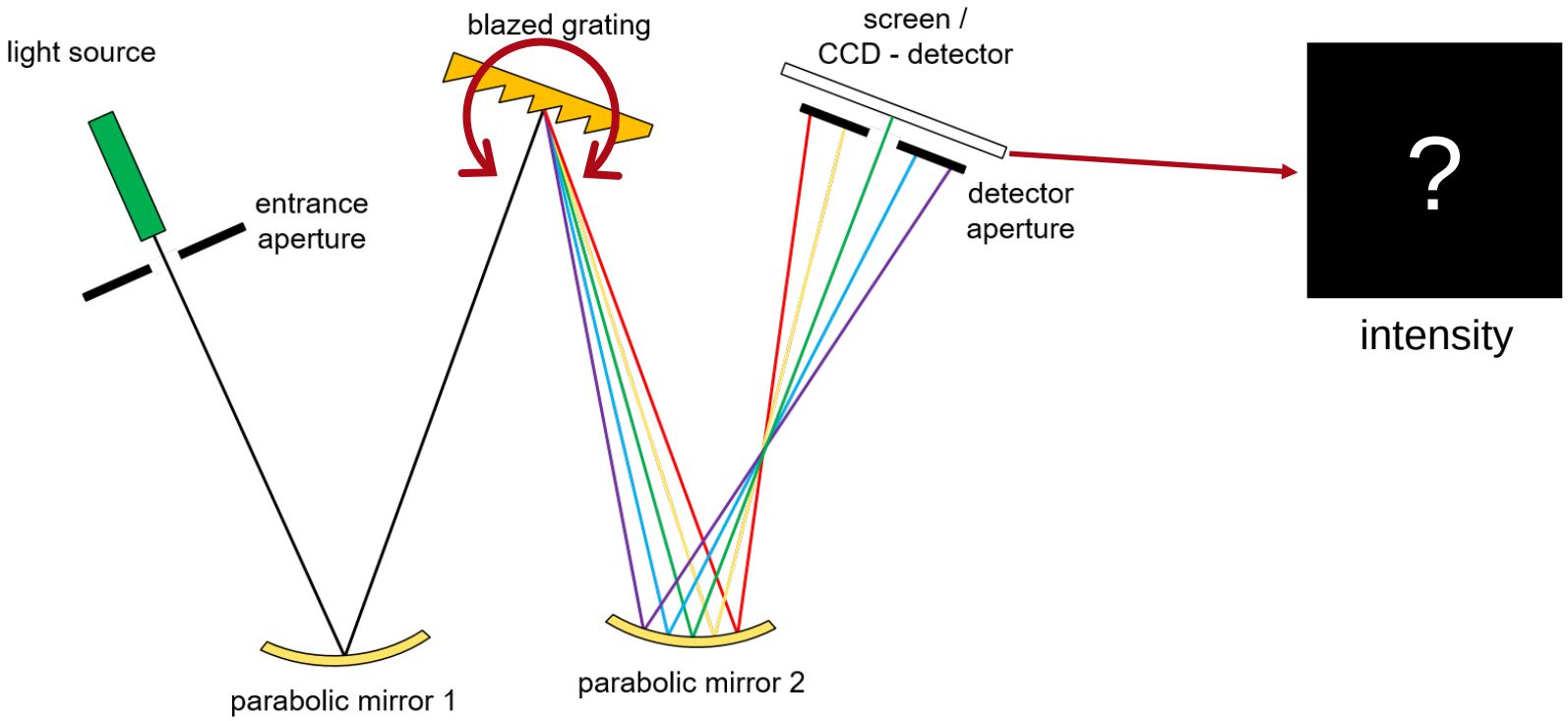
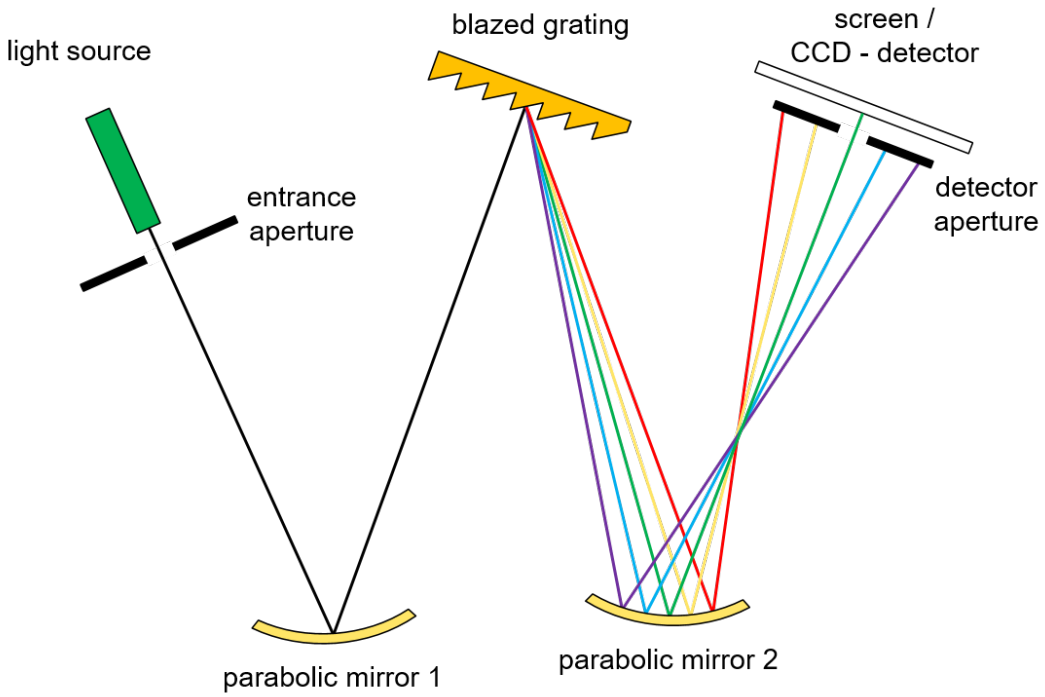
Optical Metrology > Monochromator

Czerny-Turner Monochromator

Task/System Illustration

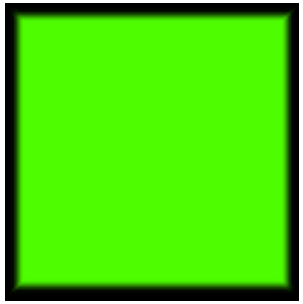


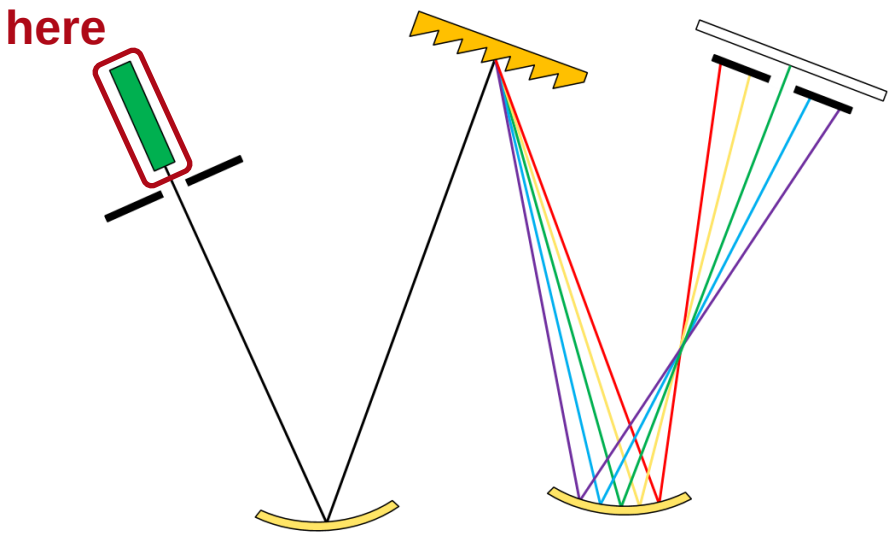
Highlights



- high-performance analysis of complex optical systems
- full vectorial analysis of gratings by using rigorous algorithm (FMM)

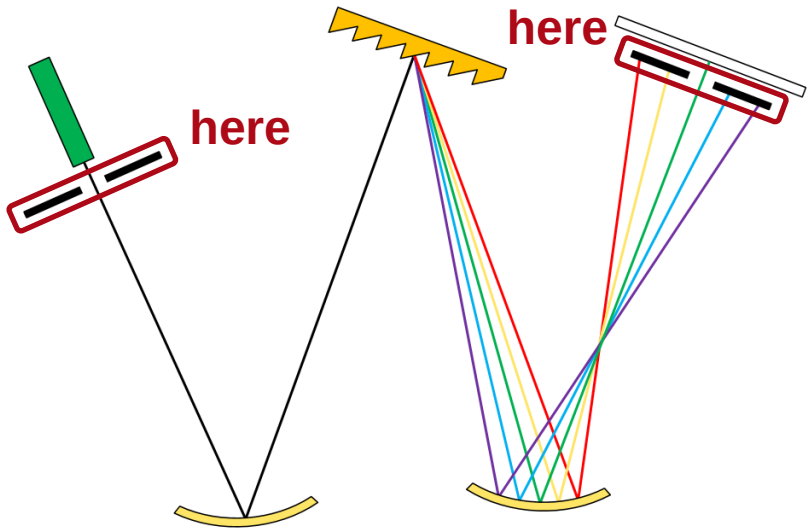
Specification: Light Source





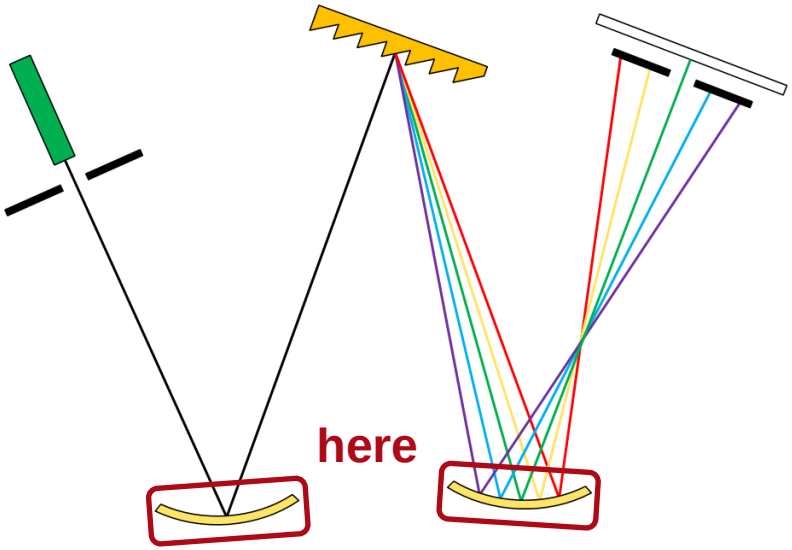
Parameter	Description / Value & Unit
type	plane wave
wavelengths	520 nm, 535 nm, 550 nm
polarization	linear in x-direction (0°)

Specification: Apertures



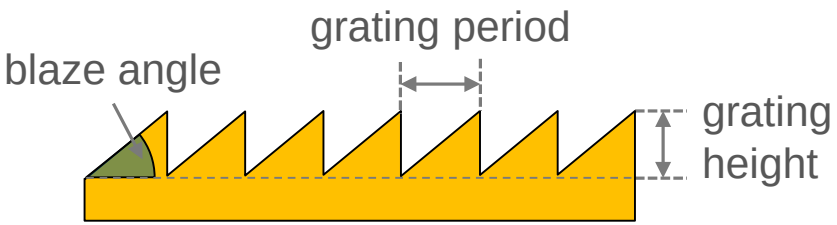
Parameter	Description / Value & Unit
width of entrance aperture	500 µm
width of detector aperture	649 µm

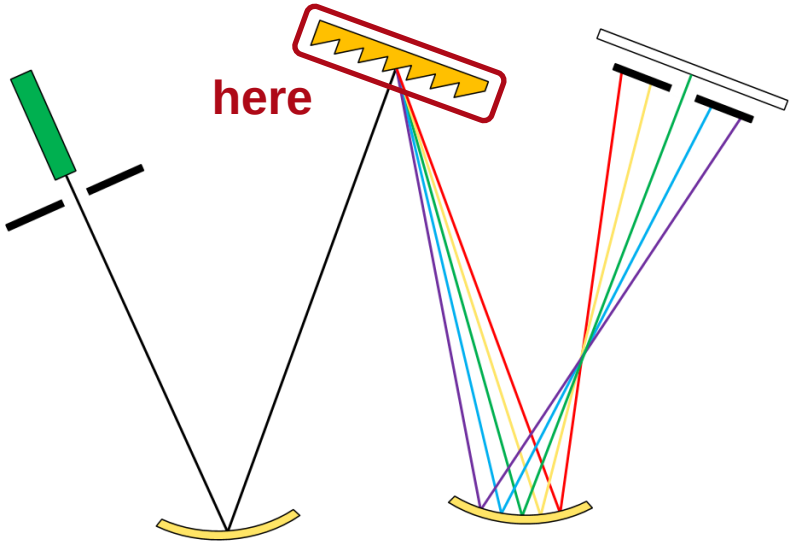
Specification: Parabolic Mirrors



Parameter	Description / Value & Unit
type	parabolic mirror
material	ideal high-reflective material
focal length	100 mm
diameter	20 mm
tilt angle	5°
reflectance	100%

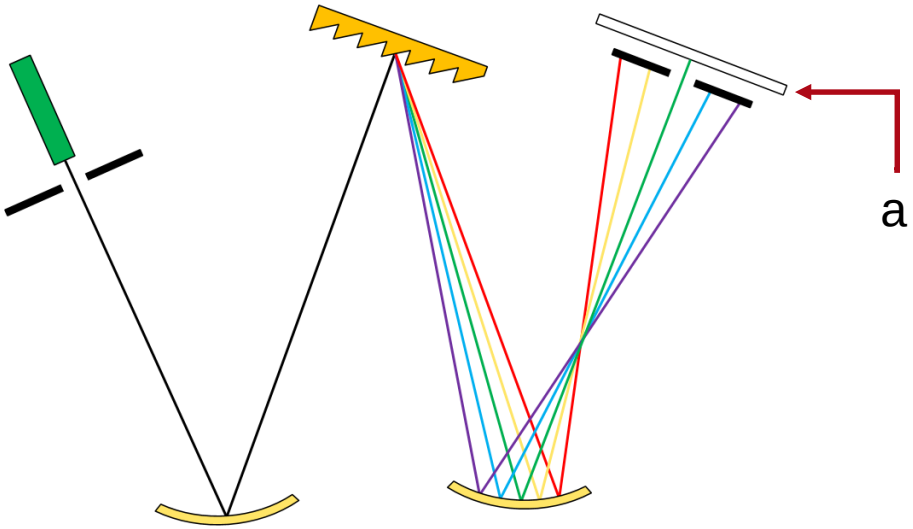
Specification: Grating





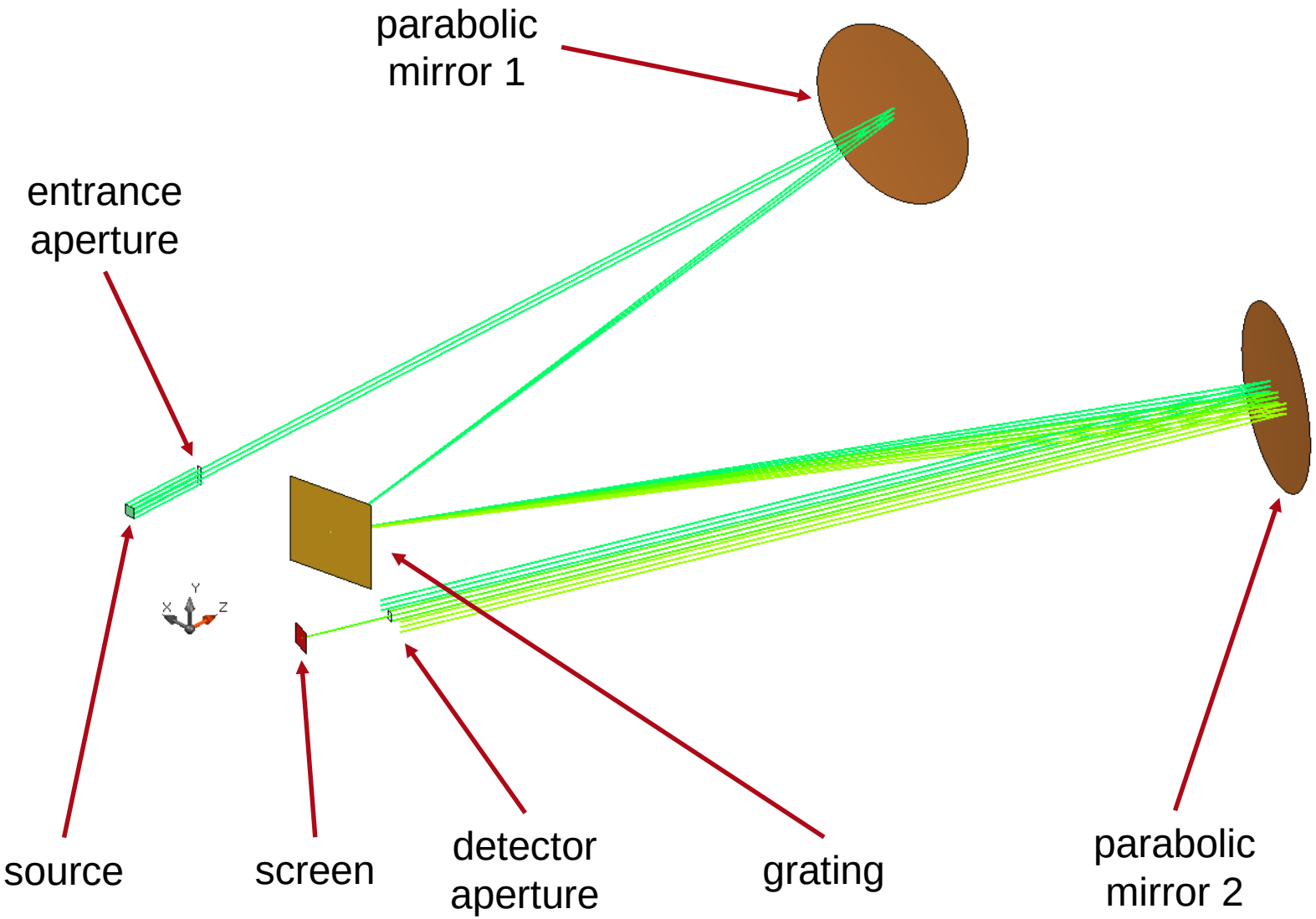
Parameter	Description / Value & Unit
grating period	833 nm
grating height	282.4 nm (optimized for -1st order efficiency)
blaze angle	18.7°
grating material	silver (Ag)
substrate material	silver (Ag)

Specification: Detectors

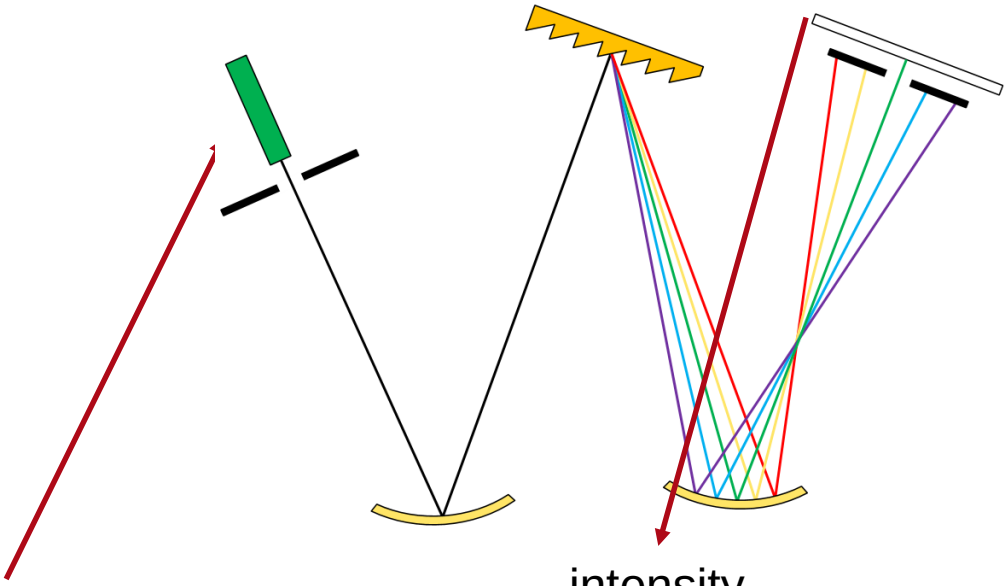


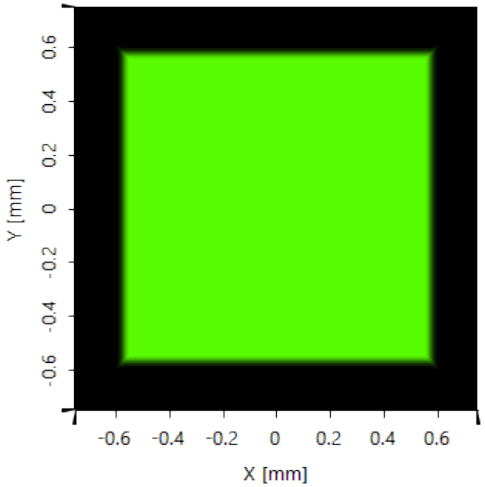
Position	Modeling Technique	Detector/Analyzer
full system	3D ray tracing	3D ray tracing system visualization
a	field tracing	2D intensity (real color view)

Result: 3D Ray Tracing

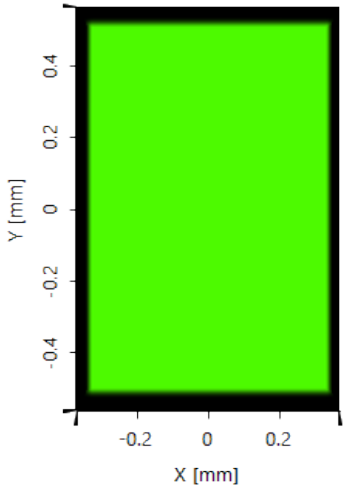


Result: Field Tracing



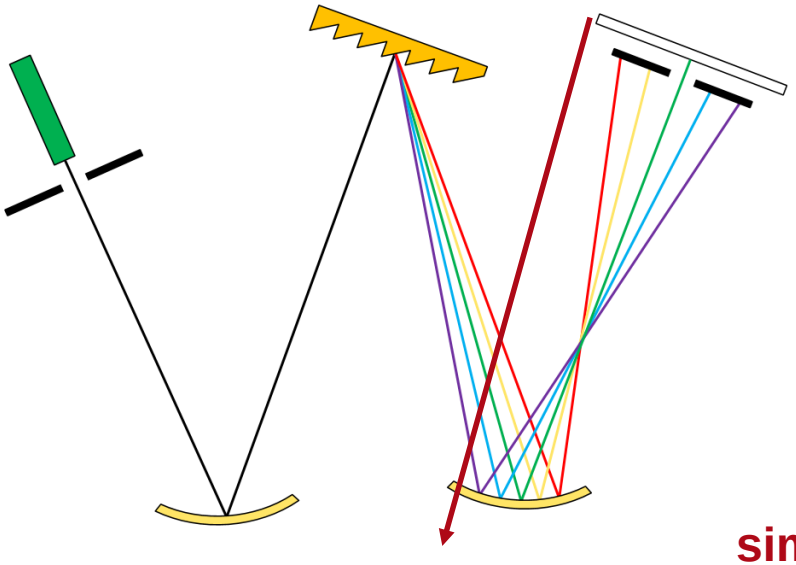


intensity

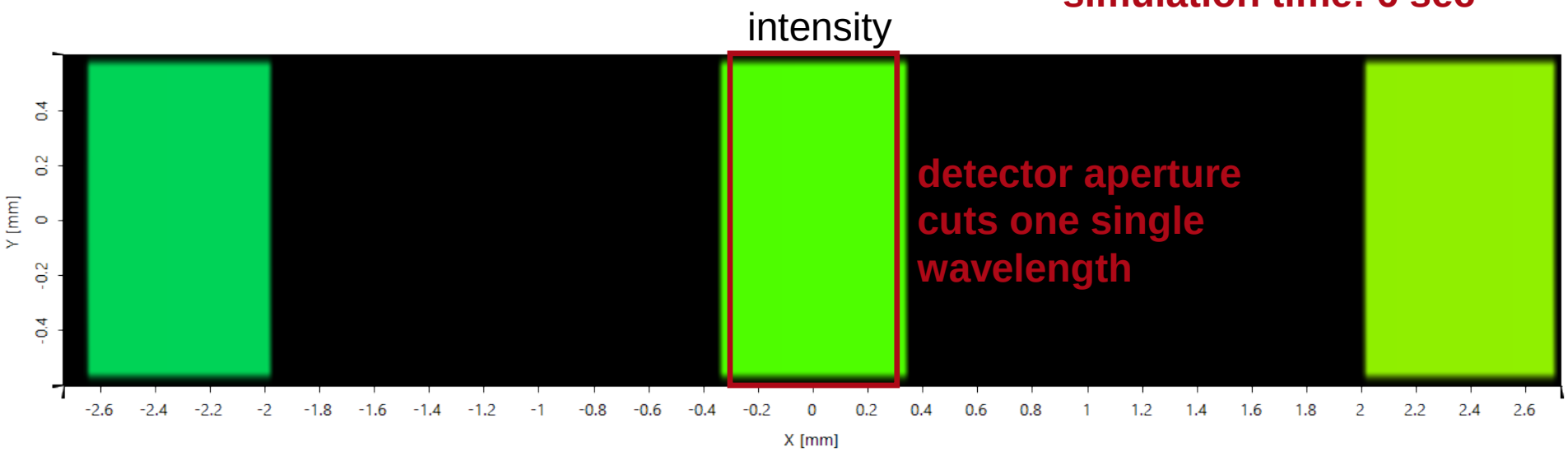


simulation time: 5 sec

Result: Field Tracing (without detector aperture)



simulation time: 6 sec



Document & Technical Info

code	MONO.0001
version of document	1.0
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category	Optical Metrology > Monochromator
author	Rui Shi (LightTrans)
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Specifications of PC Used for Simulation	
Processor	i7-4700MQ (1 CPU cores)
RAM	16 GB
Operating System	Windows 8