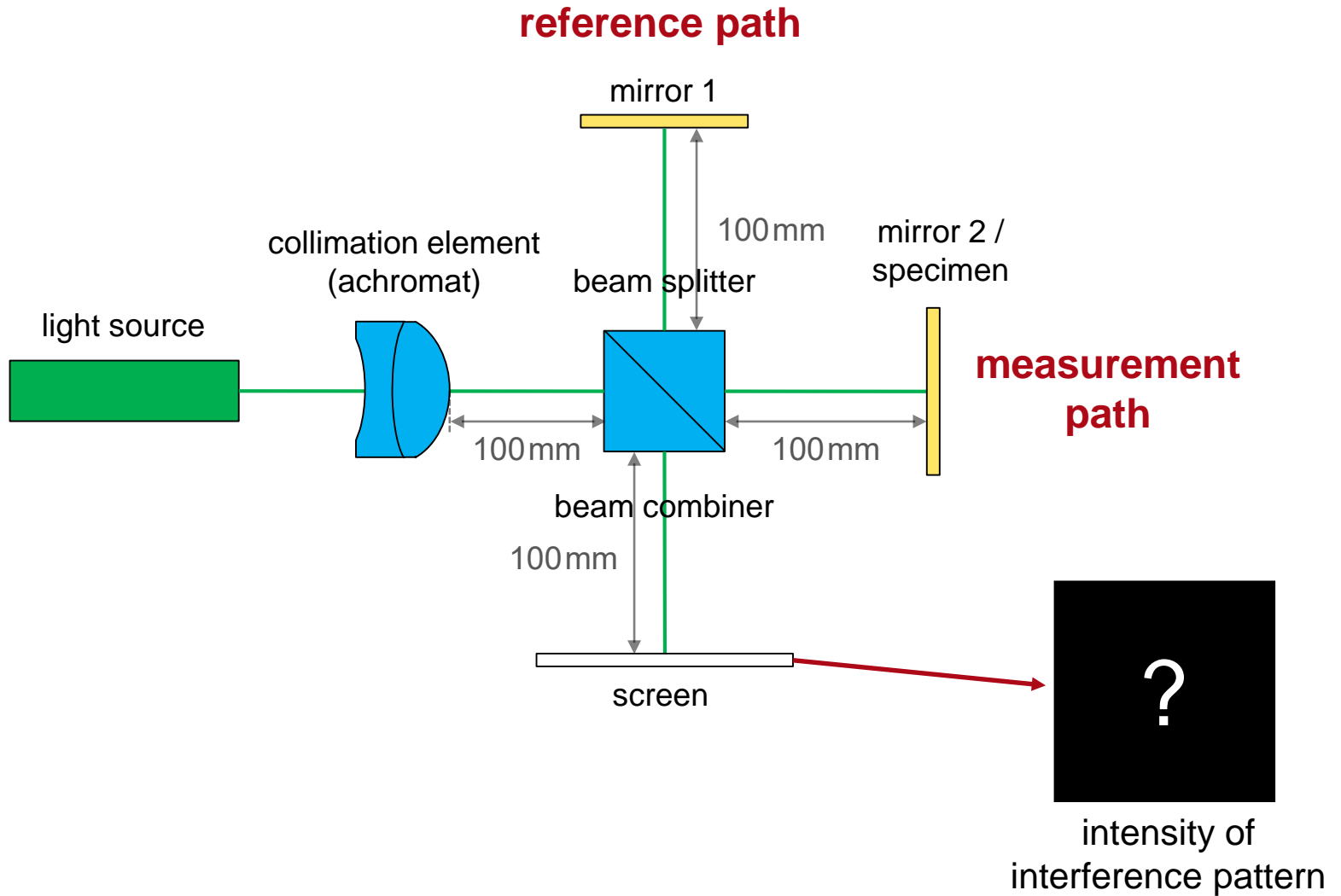


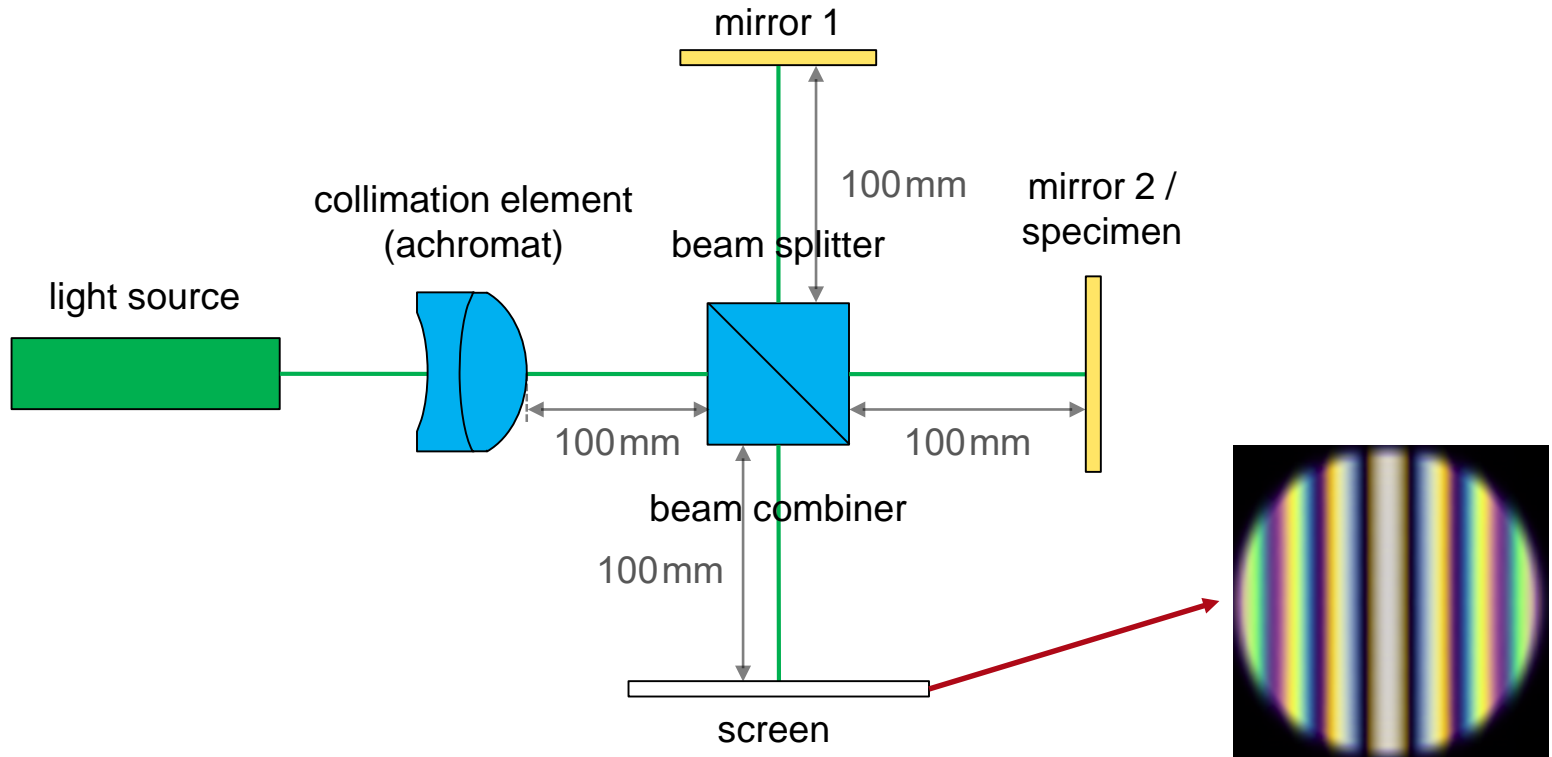
Optical Metrology > Interferometry

Michelson Interferometer with White Light Source

Task/System Illustration

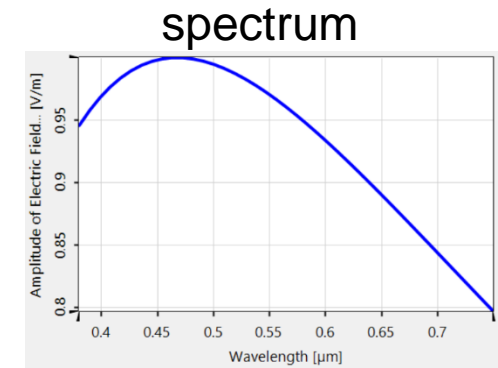
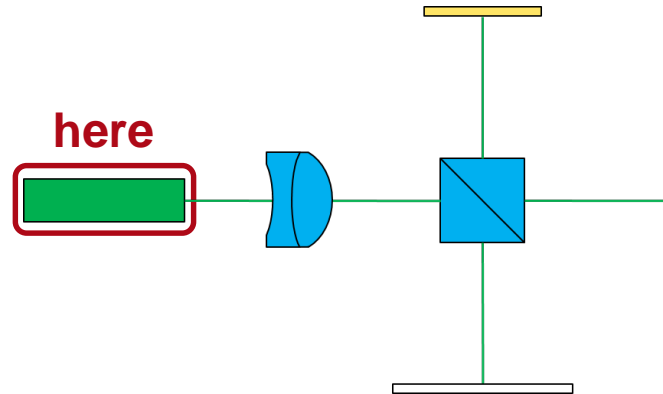


Highlights



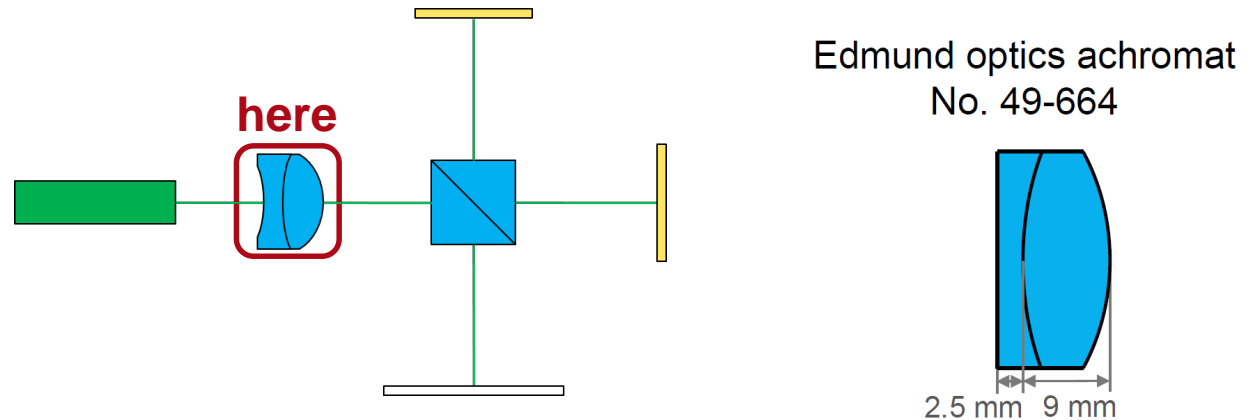
- simple switching from ray tracing analysis to fast physical optics modeling
- fast simulation of coherence effects and interference patterns

Specification: Light Source



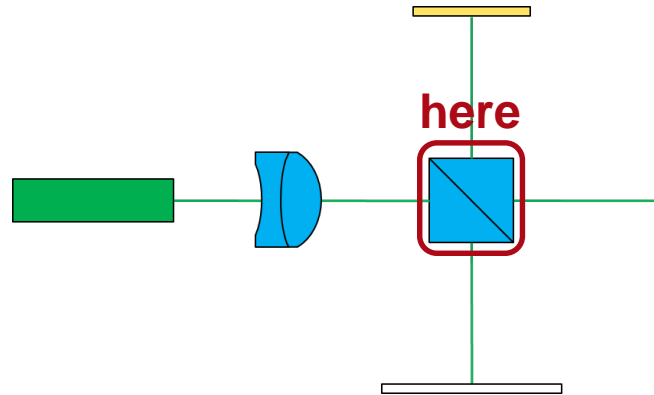
Parameter	Description / Value & Unit
type	Xenon lamp
modelled source	point source
modelled spectrum	black body spectrum with 6200K temperature
wavelength	380 nm – 750 nm in 41 discretization steps
polarization	linear in x-direction (0°)

Specification: Achromat for Collimation



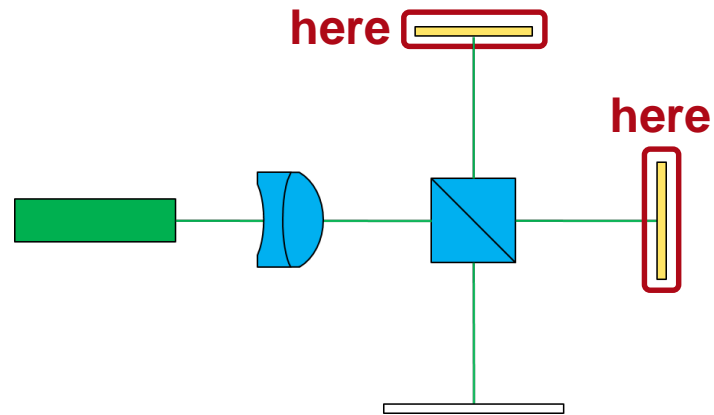
Parameter	Description / Value & Unit
type	doublet lens achromat
model	Edmund optics No. 49-664
wavelength	425 nm – 675 nm
eff. focal length	40 mm
back focal length	33.48 mm
diameter	25 mm

Specification: Beam Splitter



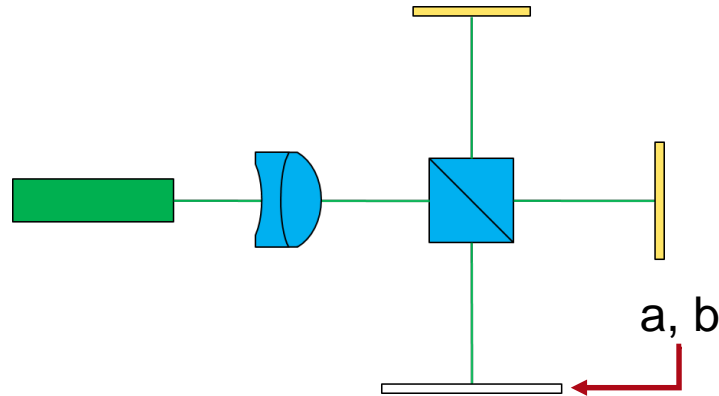
Parameter	Description / Value & Unit
type	ideal beam splitter
splitting ratio	50:50

Specification: Mirrors



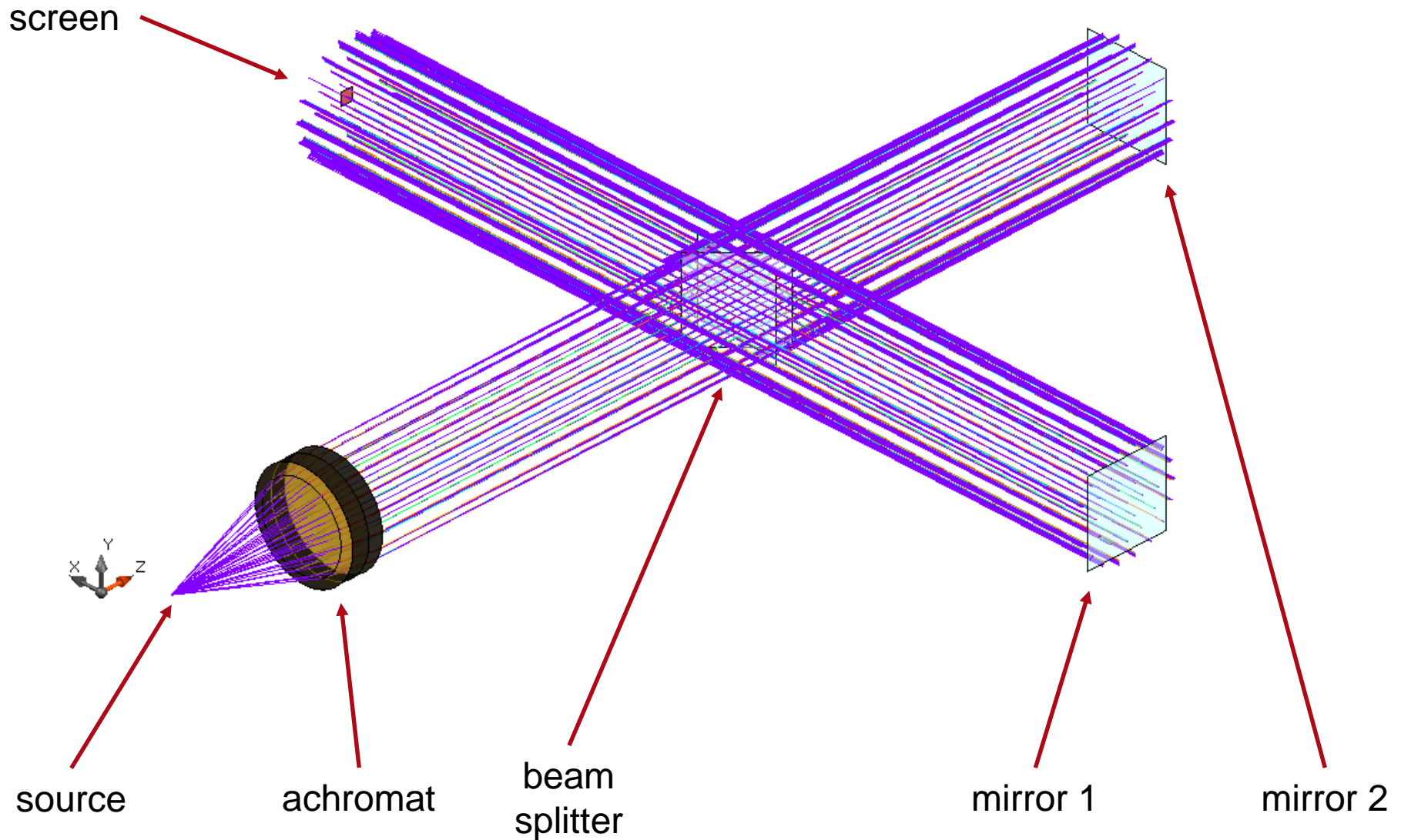
Parameter	Description / Value & Unit
type	ideal mirrors
mirror 1 tilt	0.001°
mirror 2 shift	0, 2 μm, 4 μm, 6 μm
reflectance	100%

Specification: Detectors

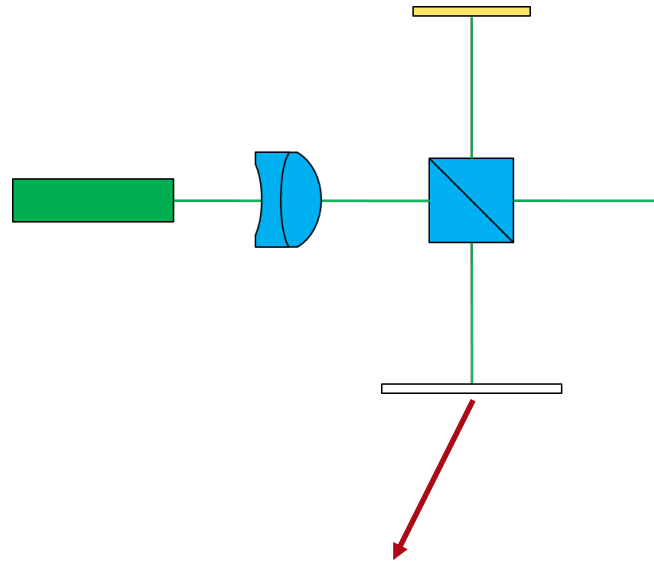


Position	Modeling Technique	Detector/Analyzer
full system	3D ray tracing	3D ray tracing system visualization
a	ray tracing	dot diagram
b	field tracing	2D intensity and interference pattern (real color view)

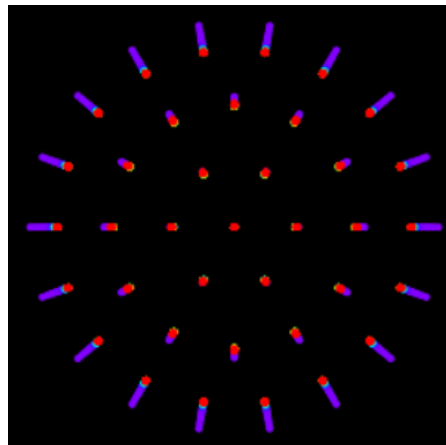
Result: 3D Ray Tracing



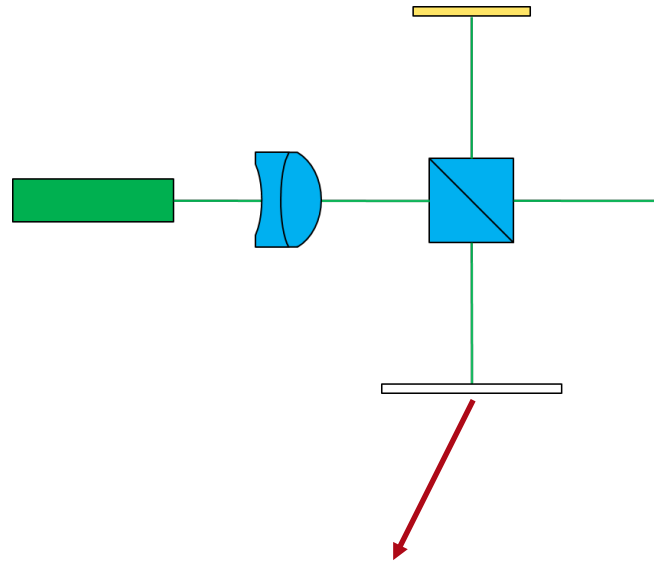
Result: Ray Tracing



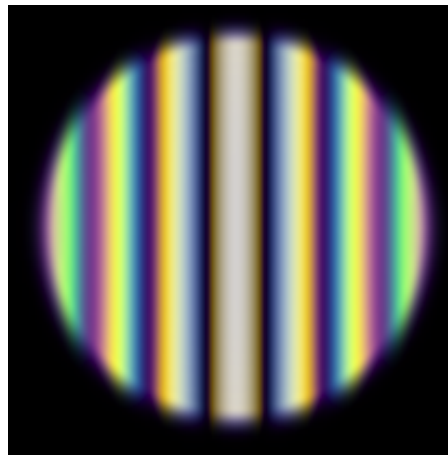
dot diagram



Result: Field Tracing

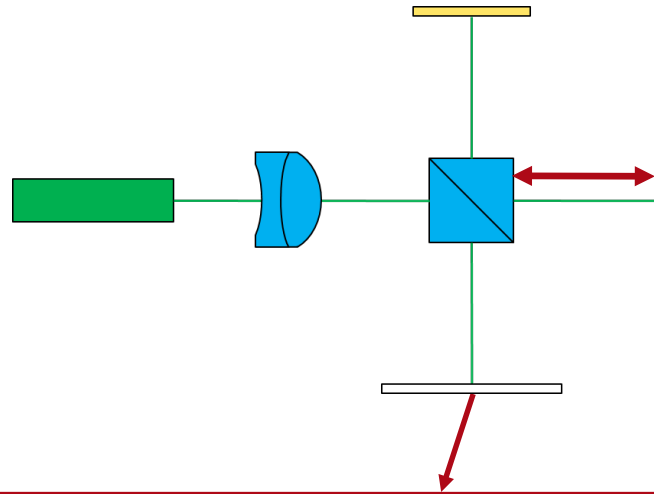


intensity (real color view)

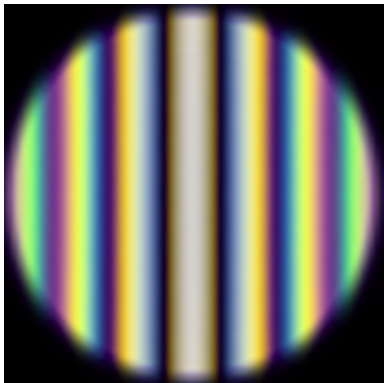


simulation time: 5 sec

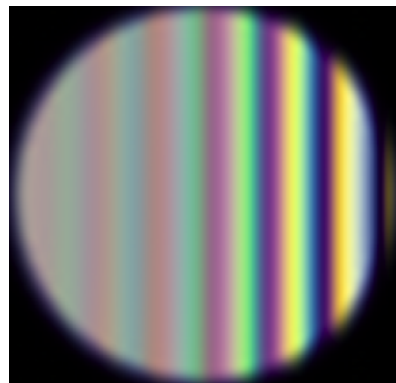
Result: Field Tracing for Shifted Mirror 2



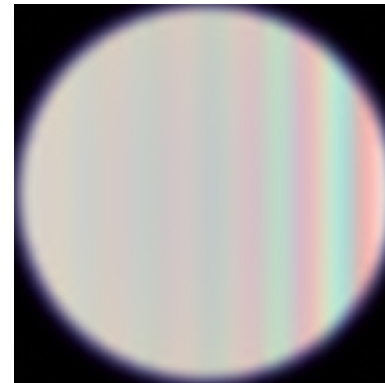
axial shift: $0\mu\text{m}$



$2\mu\text{m}$



$4\mu\text{m}$



$6\mu\text{m}$



coherence length of light source in range of $2\mu\text{m}$

Document & Technical Info

code	IF.0002
version of document	1.0
title	Michelson Interferometer with White Light
category	Optical Metrology > Interferometry
author	Rui Shi (LightTrans)
used VL version	7.0.0.29

Specifications of PC Used for Simulation

Processor	i7-4700MQ (1 CPU cores)
RAM	16 GB
Operating System	Windows 8