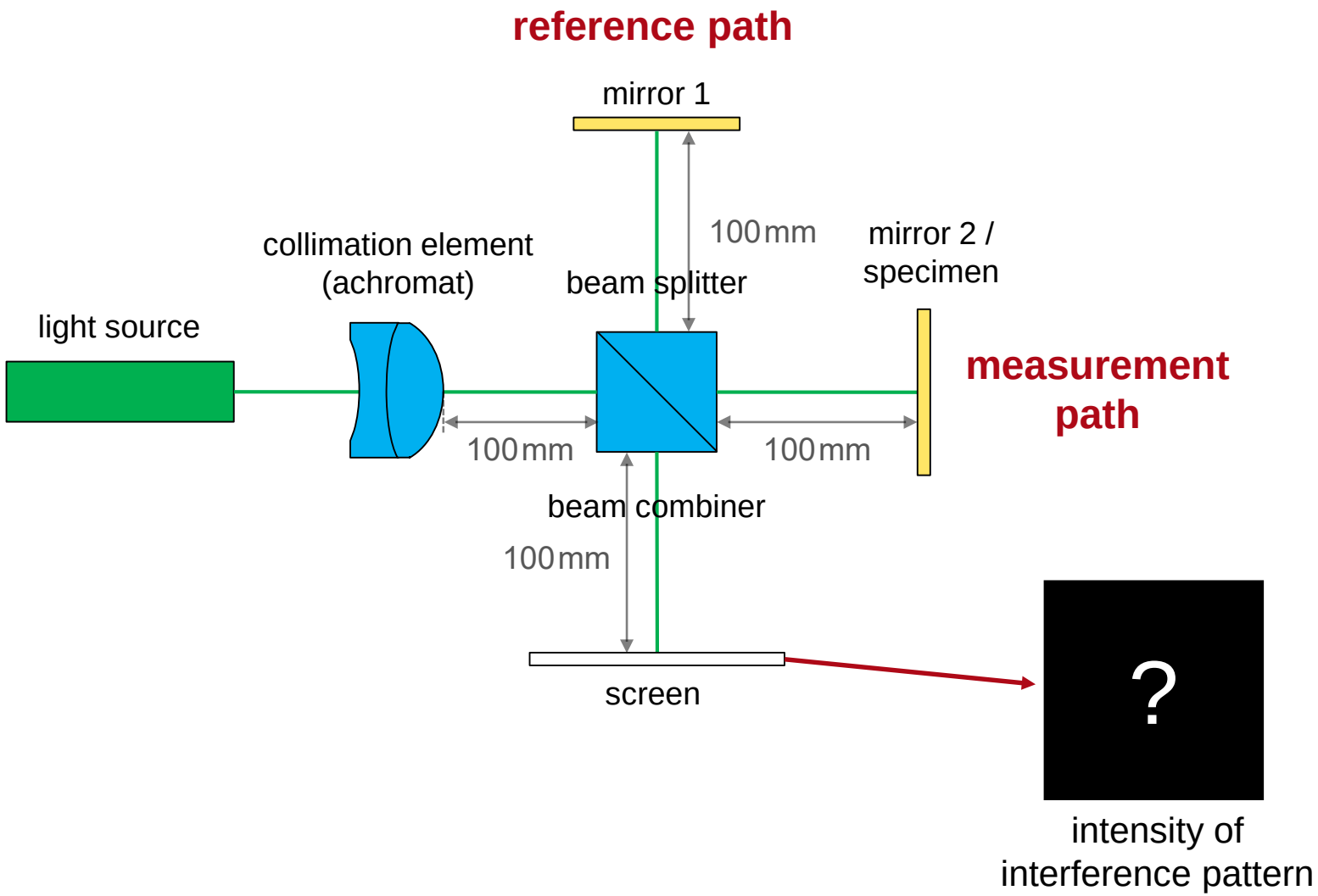
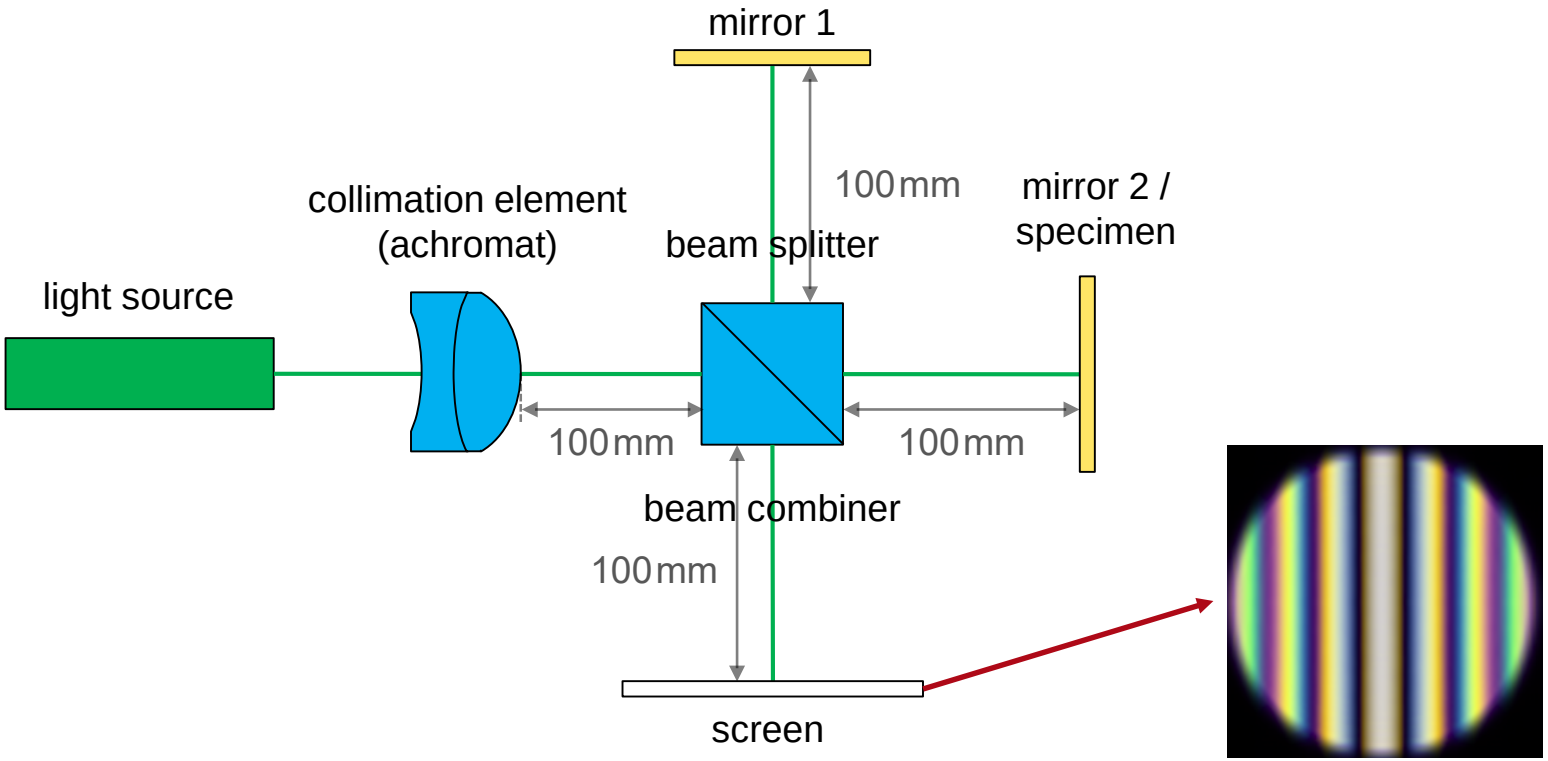
Optical Metrology > Interferometry

Michelson Interferometer for Optical Topography Scanning Interferometry

Task/System Illustration

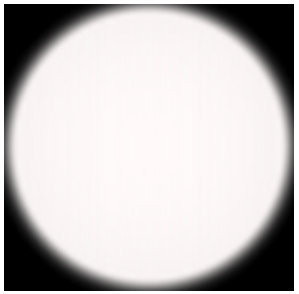


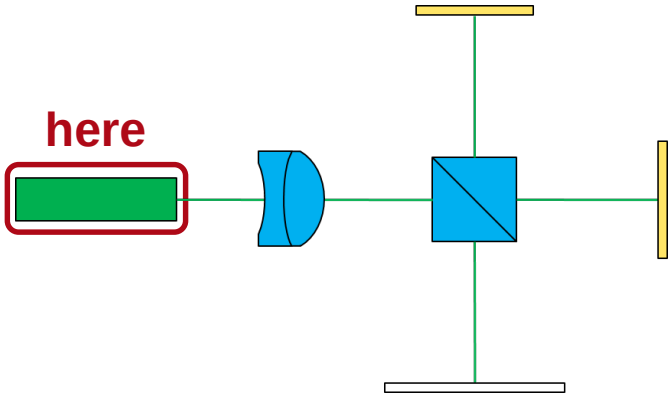
Highlights

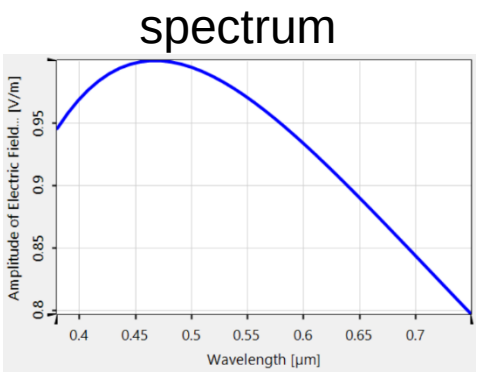


- simple switching from ray tracing analysis to fast physical optics modeling
- fast simulation of coherence effects and interference patterns

Specification: Light Source

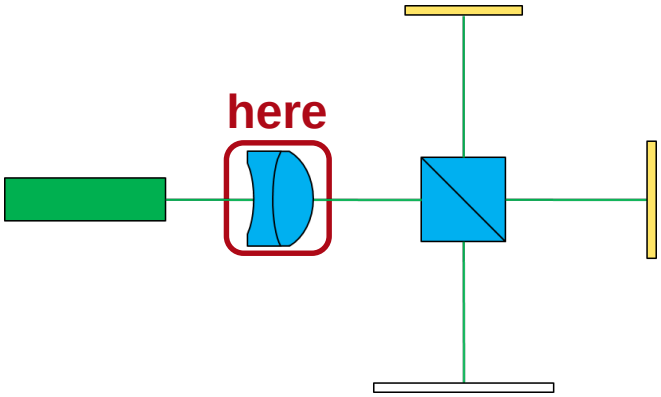




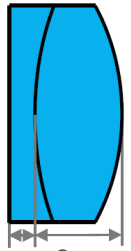


Parameter	Description / Value & Unit
type	Xenon lamp
modelled source	point source
modelled spectrum	black body spectrum with 6200 K temperature
wavelength	380 nm – 750 nm in 41 discretization steps
polarization	linear in x-direction (0°)

Specification: Achromat for Collimation

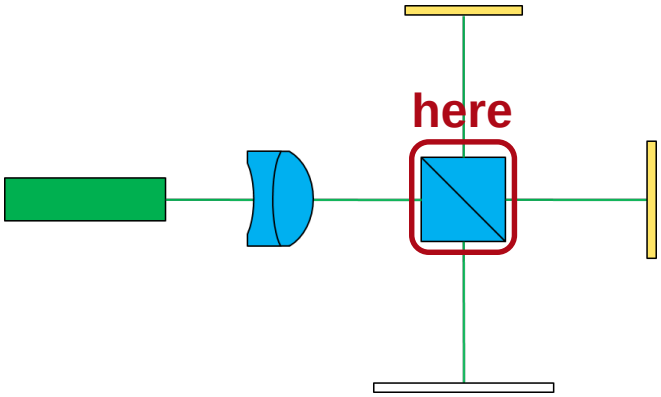


Edmund optics achromat
No. 49-664



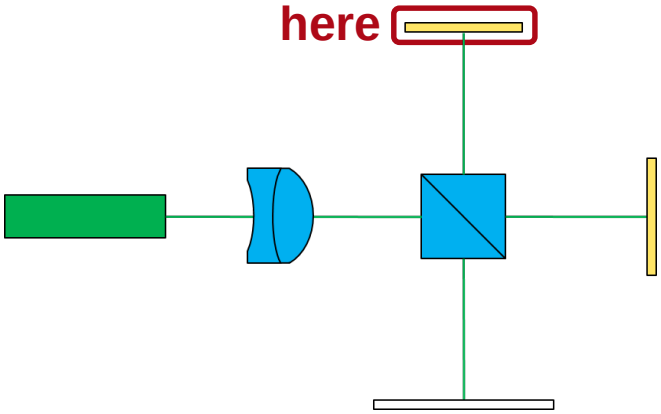
Parameter	Description / Value & Unit
type	doublet lens achromat
model	Edmund optics No. 49-664
wavelength	425 nm – 675 nm
eff. focal length	40 mm
back focal length	33.48 mm
diameter	25 mm

Specification: Beam Splitter



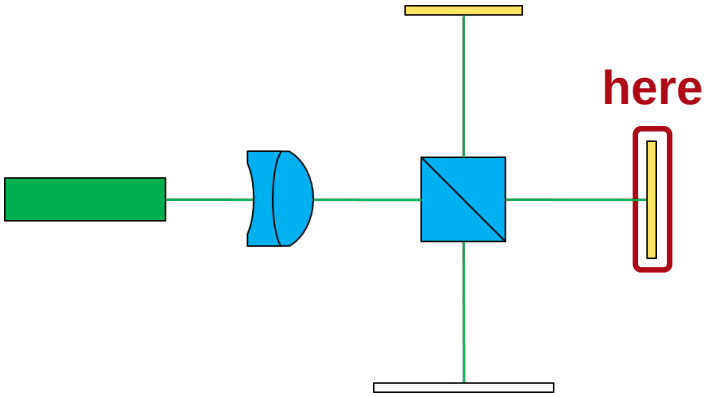
Parameter	Description / Value & Unit
type	ideal beam splitter
splitting ratio	50:50

Specification: Mirror Reference Path



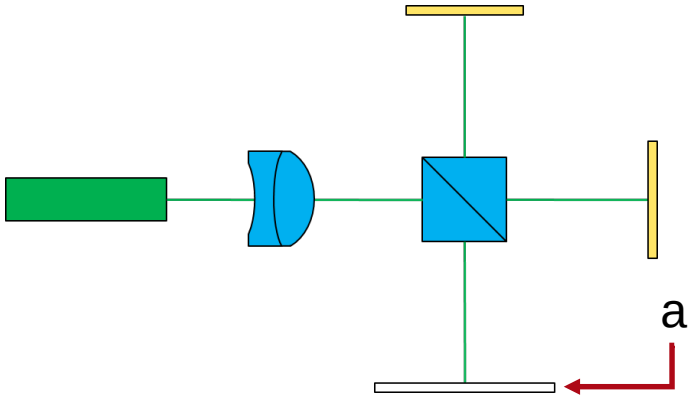
Parameter	Description / Value & Unit
type	ideal mirror
reflectance	100%

Specification: Mirror Measurement Path



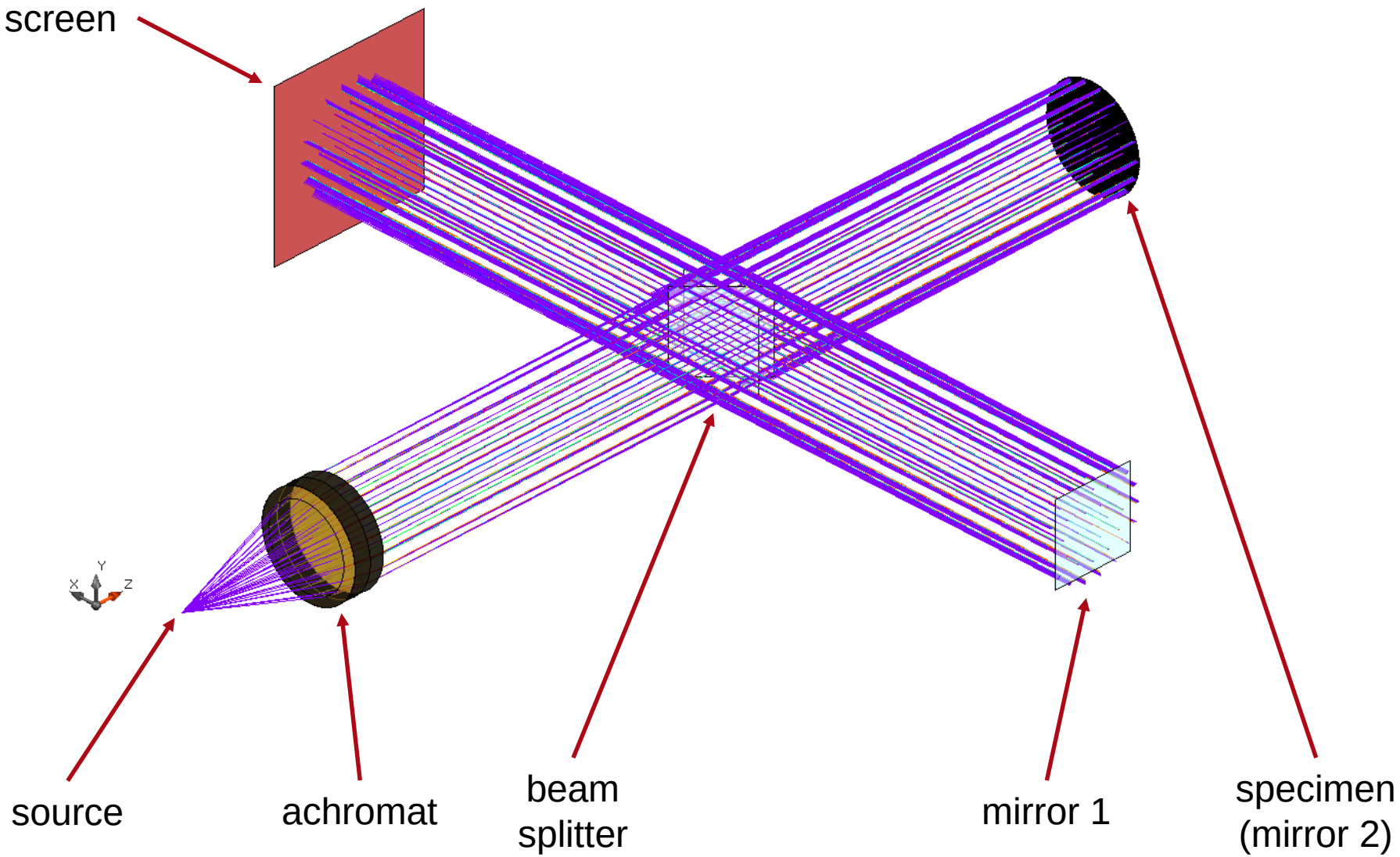
Parameter	Description / Value & Unit
specimen	topographic model of 1 Euro coin
material	silver

Specification: Detectors

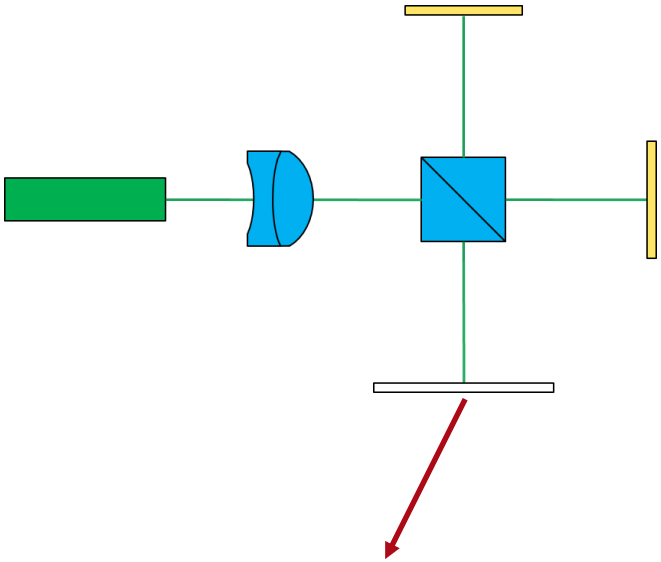


Position	Modeling Technique	Detector/Analyzer
full system	3D ray tracing	3D ray tracing system visualization
a	field tracing	2D intensity and interference pattern (real color view)

Result: 3D Ray Tracing

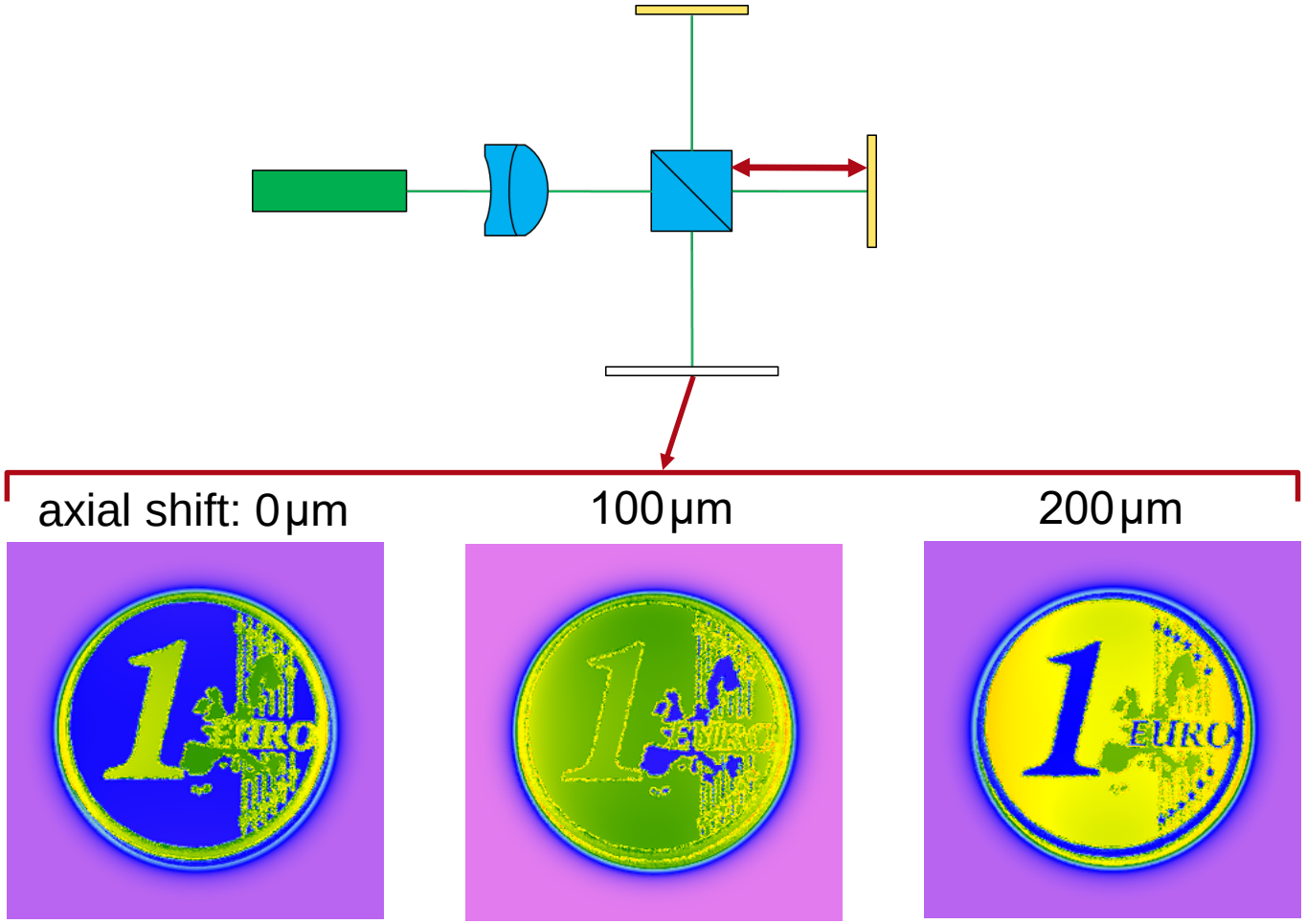


Result: Field Tracing



intensity (false color view)

Result: Field Tracing for Shifted Specimen



by scanning the axial position of the specimen the topography can be investigated

Document & Technical Info

code	IF.0003
version of document	1.0
title	Michelson Interferometer for Optical Coherence Tomography
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