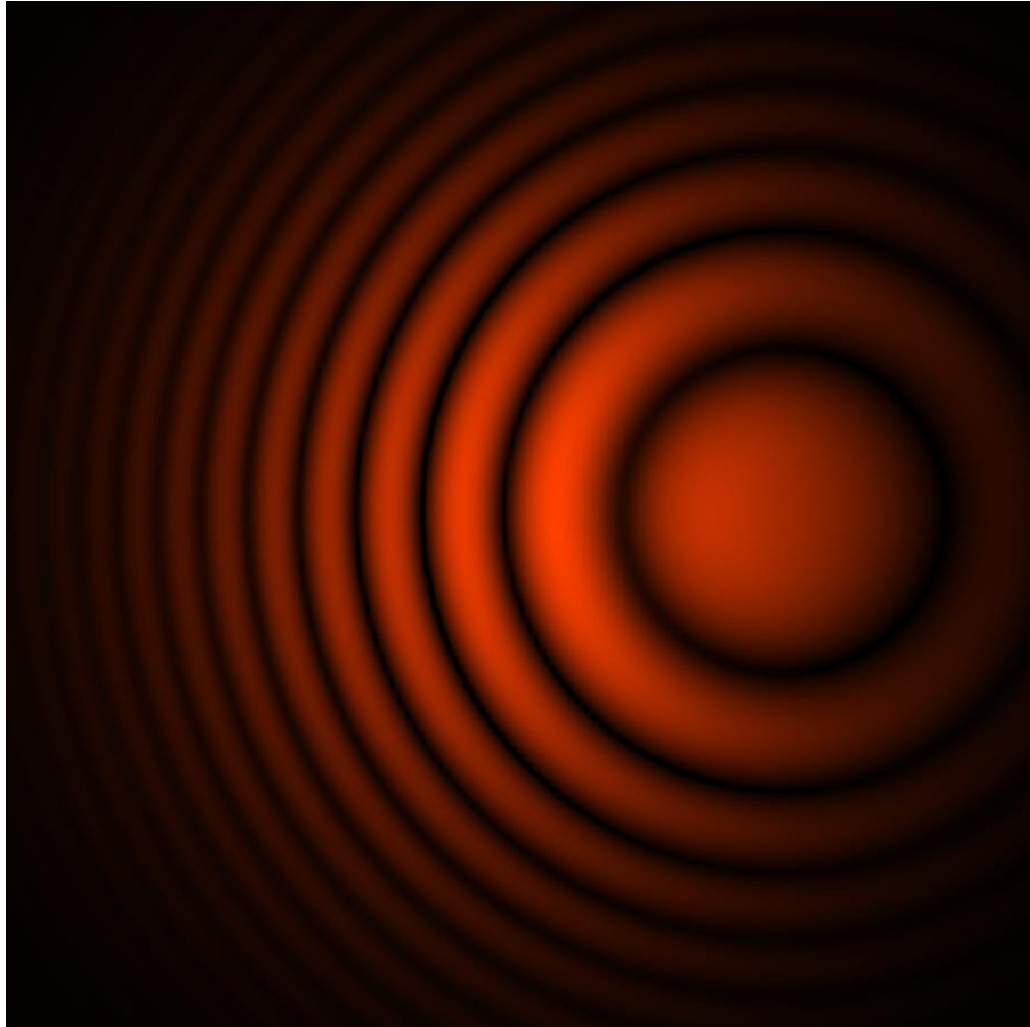


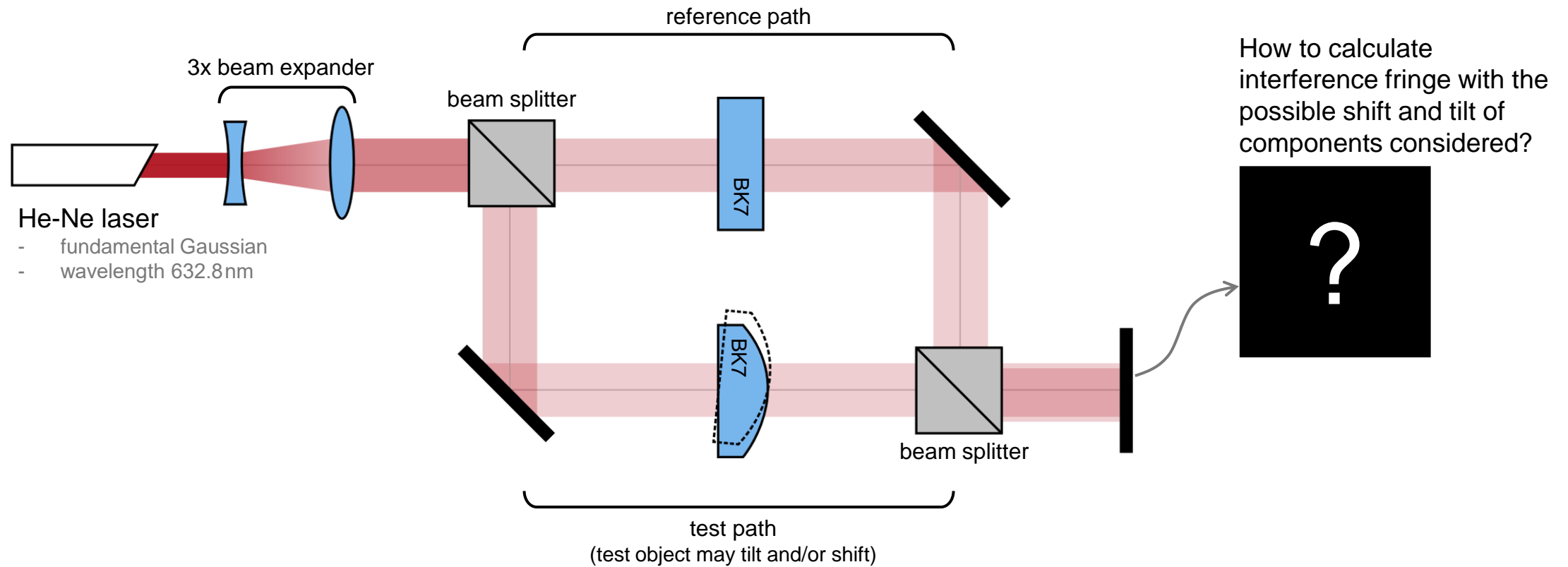
Mach-Zehnder Interferometer

Abstract

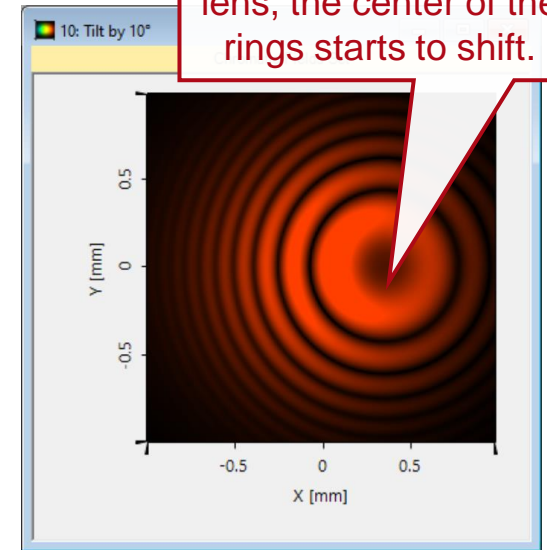
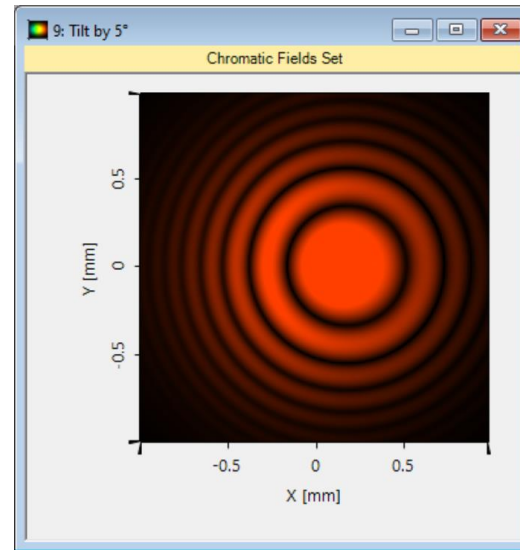
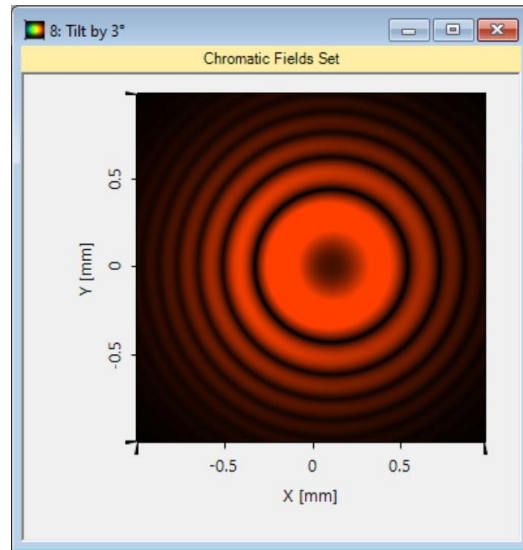
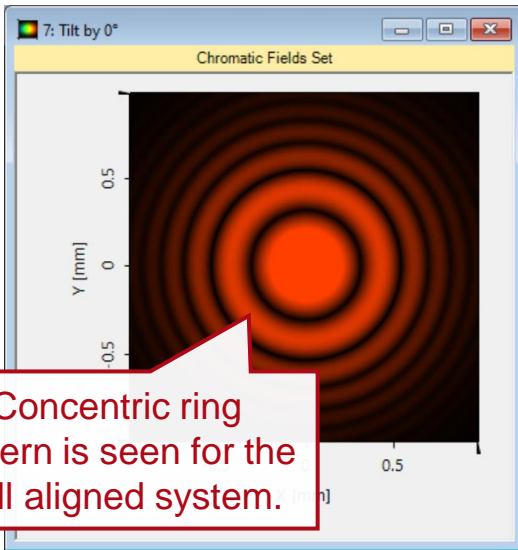
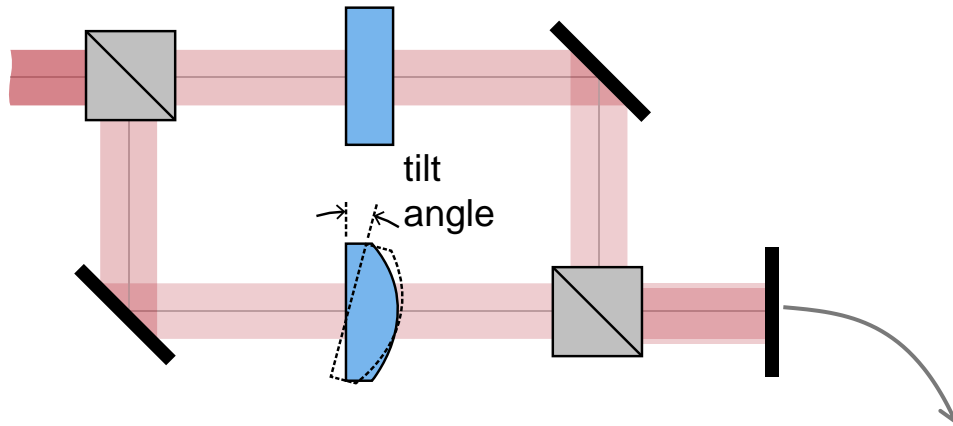


Interferometry is an important technology for optical metrology. It is widely used for the measurements of e.g. surface profile, defects, mechanical and thermal distortion with high precision. As a typical example, a Mach-Zehnder interferometer with coherent laser source is build up in VirtualLab Fusion, with the help of non-sequential field tracing. It is demonstrated that how the tilt and shift of an optical elements may affect the interference fringe pattern.

Modeling Task

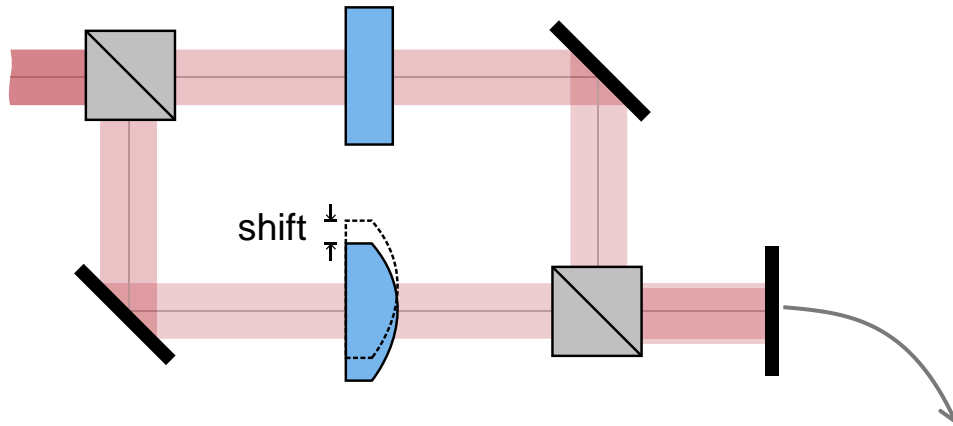


Interference Fringe Due to Component Tilt

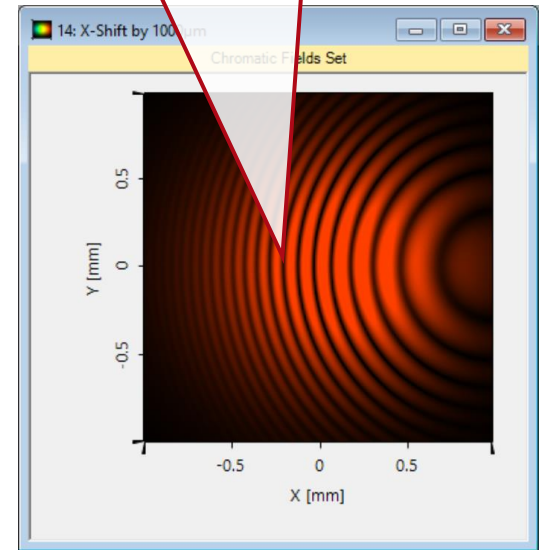
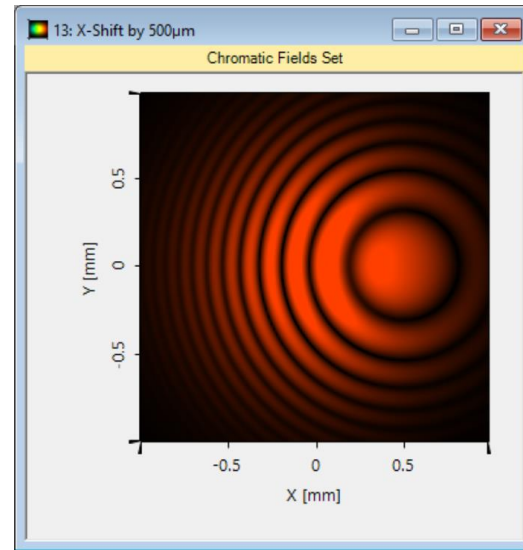
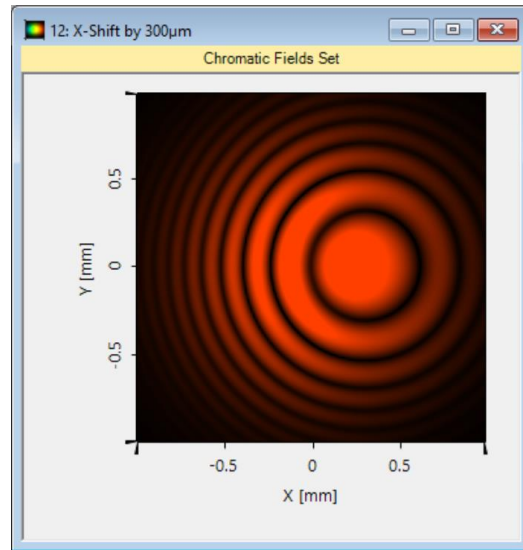
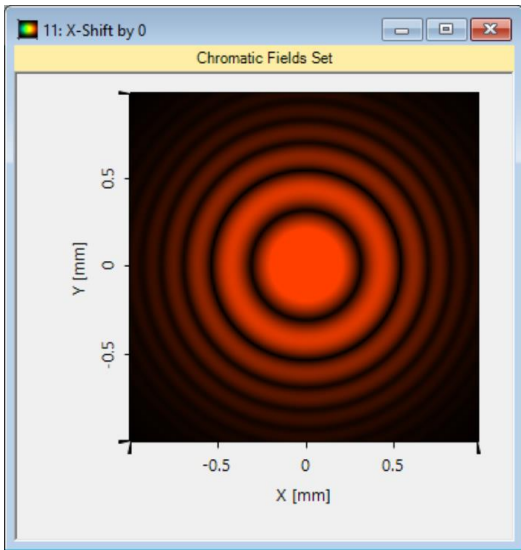


Due to the tilt of the lens, the center of the rings starts to shift.

Interference Fringe Due to Component Shift

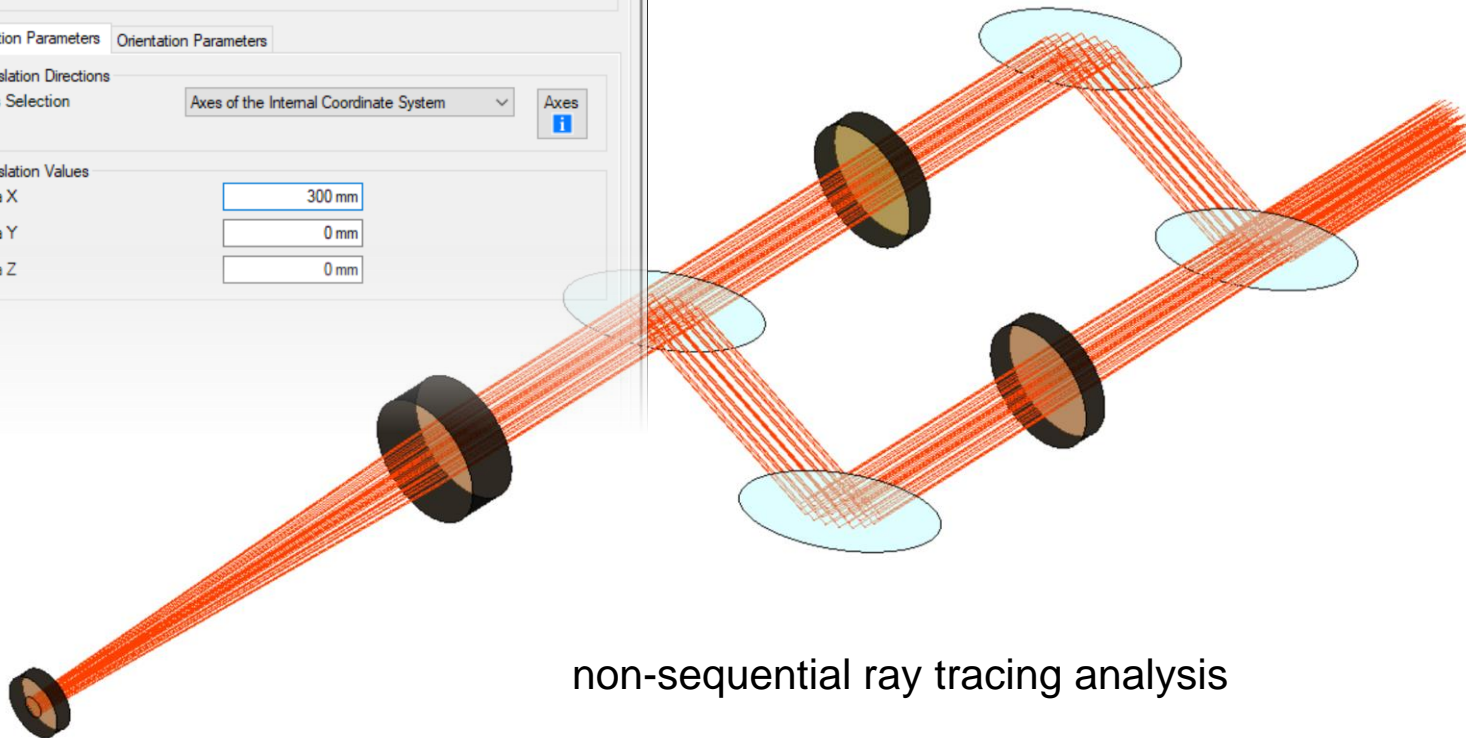
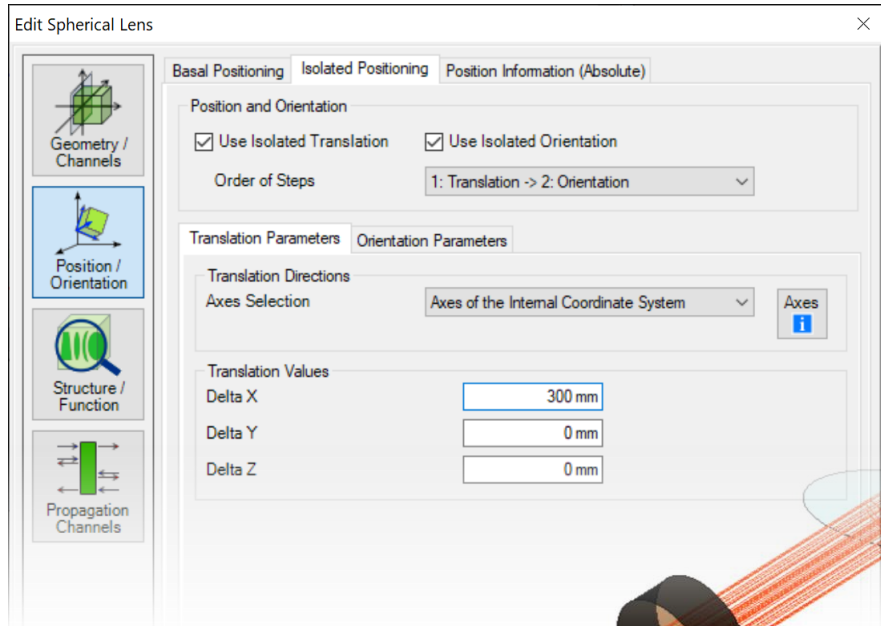


With large shift distance, only the part of the lens contribute to the interference and the fringes tend to become linear.

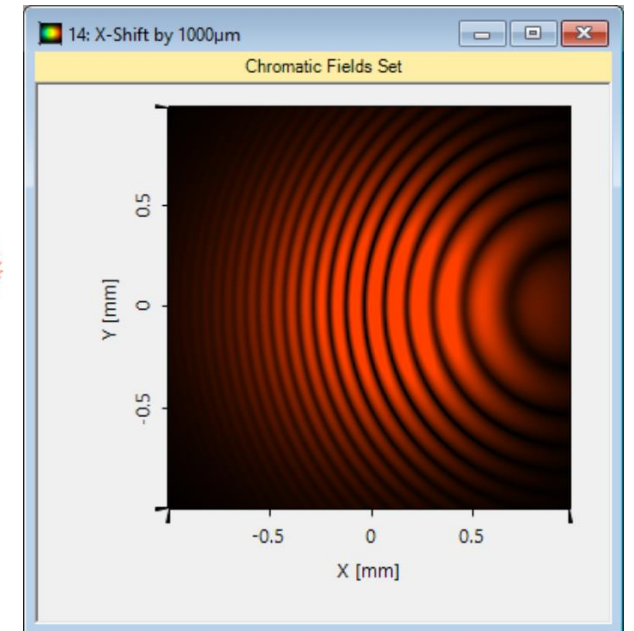


Peek into VirtualLab Fusion

flexible position and orientation settings



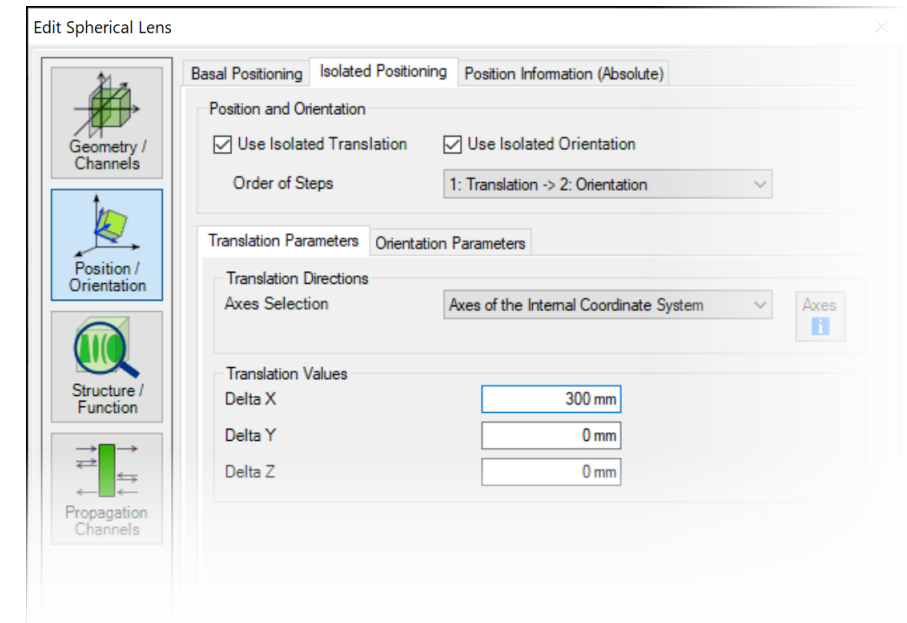
non-sequential ray tracing analysis



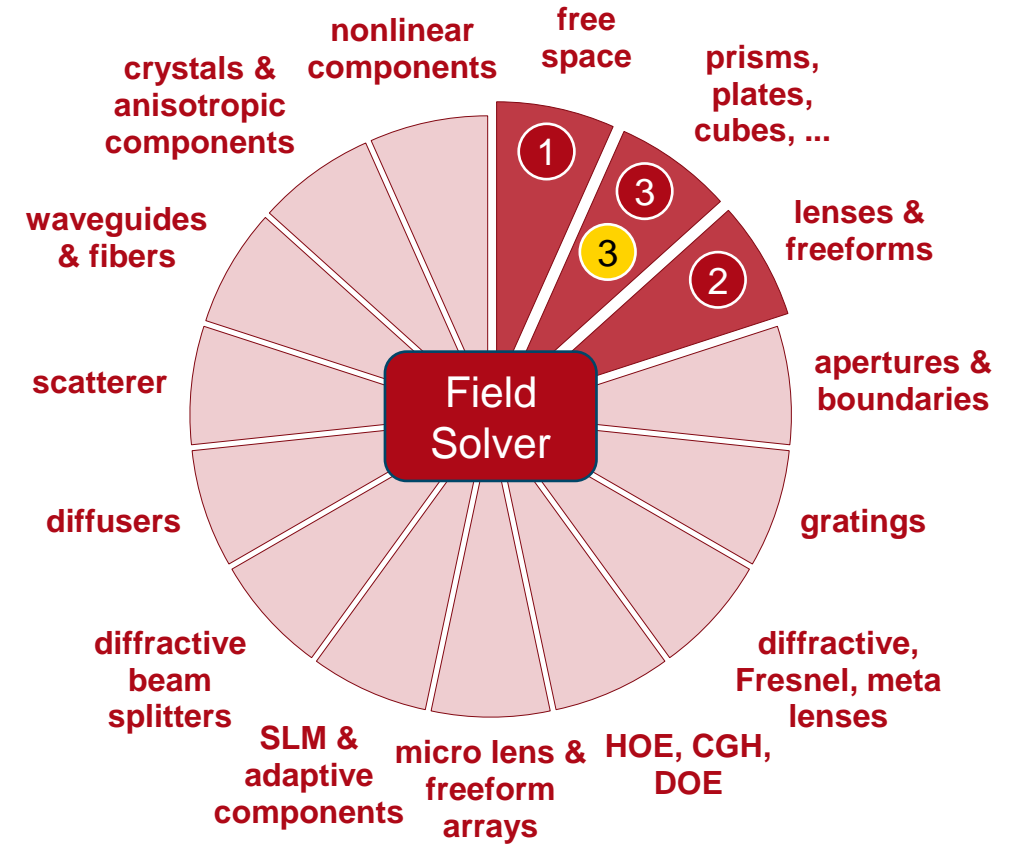
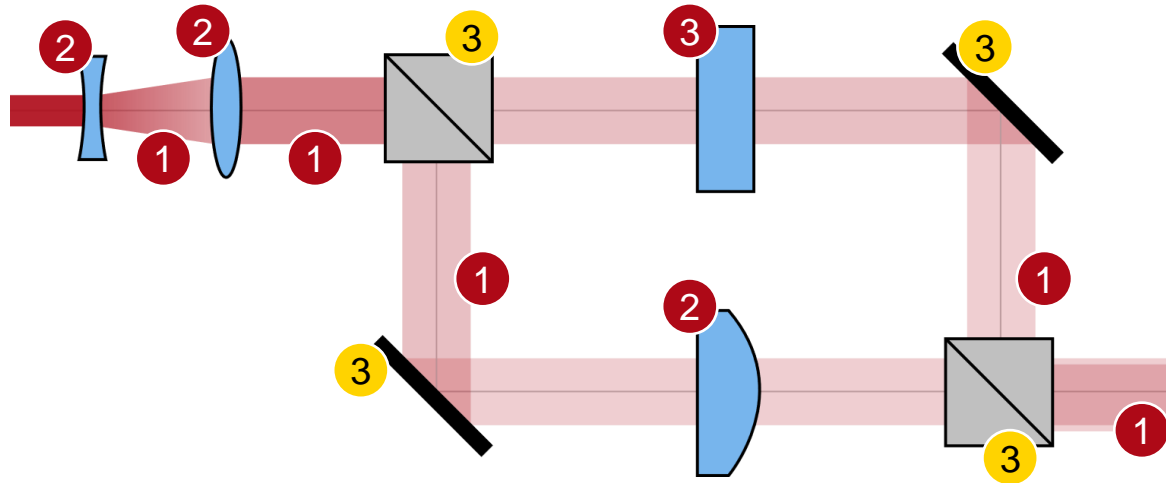
direct observation of interference fringes

Workflow in VirtualLab Fusion

- Set up input Gaussian field
 - [Basic Source Models](#) [Tutorial Video]
- Set the position and orientation of components
 - [LPD II: Position and Orientation](#) [Tutorial Video]
- Configure the surface channels of components
 - [Channel Configuration for Surfaces and Grating Regions](#) [Use Case]



VirtualLab Fusion Technologies



idealized component

Document Information

title	Mach-Zehnder Interferometer
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category	Application Use Case
further reading	<ul style="list-style-type: none">- Laser-Based Michelson Interferometer and Interference Fringe Exploration- Fizeau Interferometer for Optical Testing