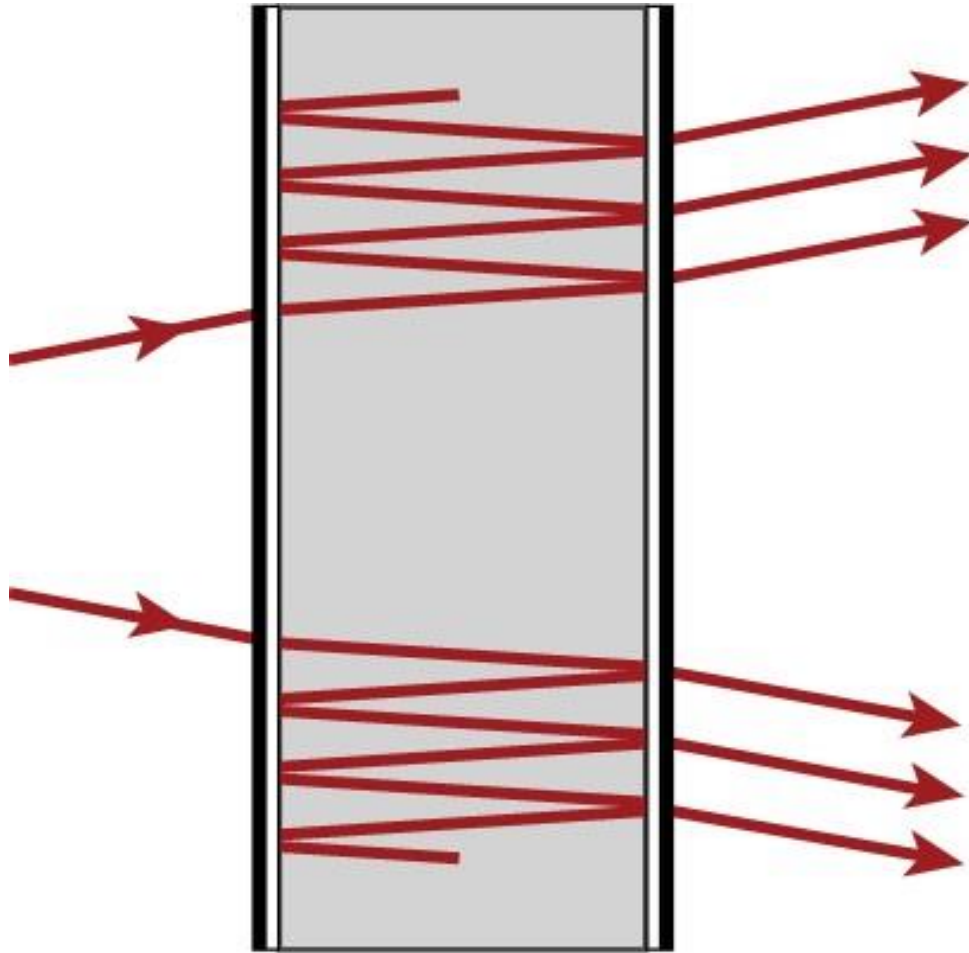


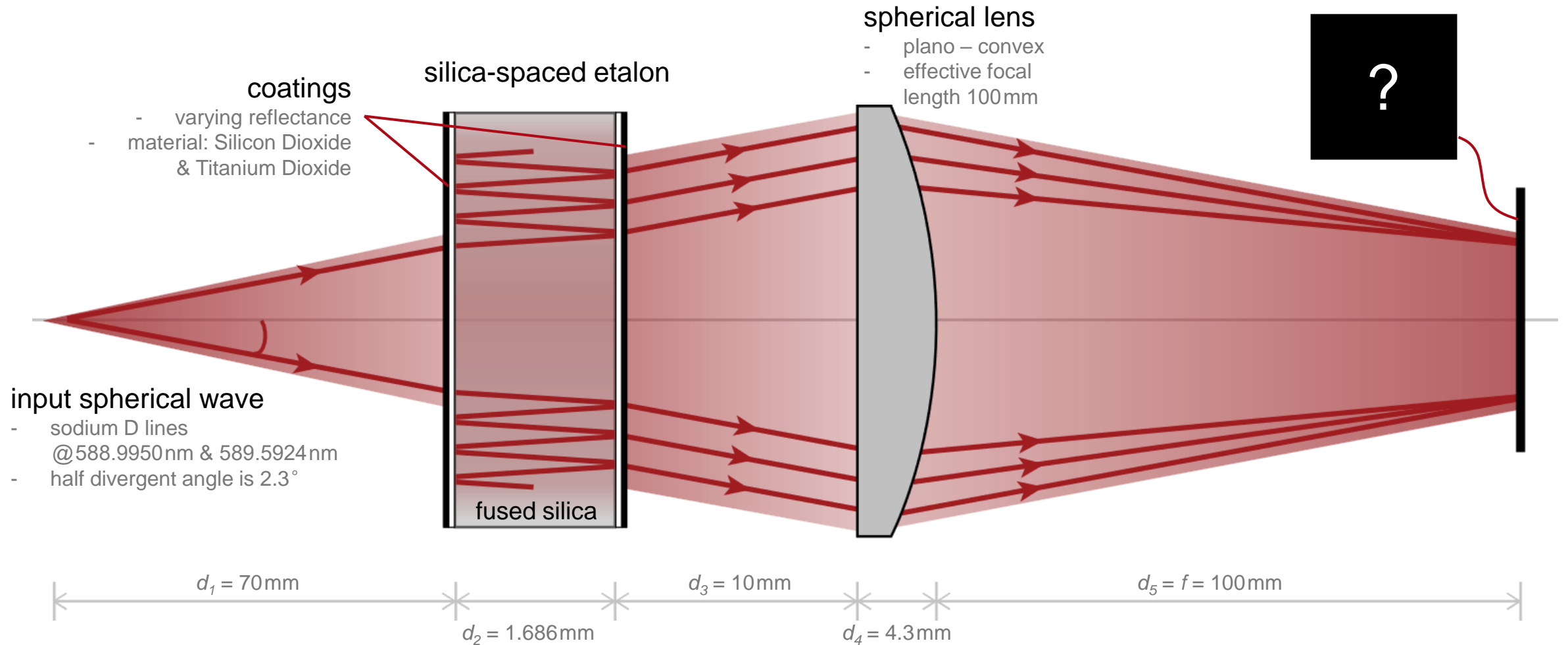
Examination of Sodium D Lines with Fabry-Pérot Etalon

Abstract

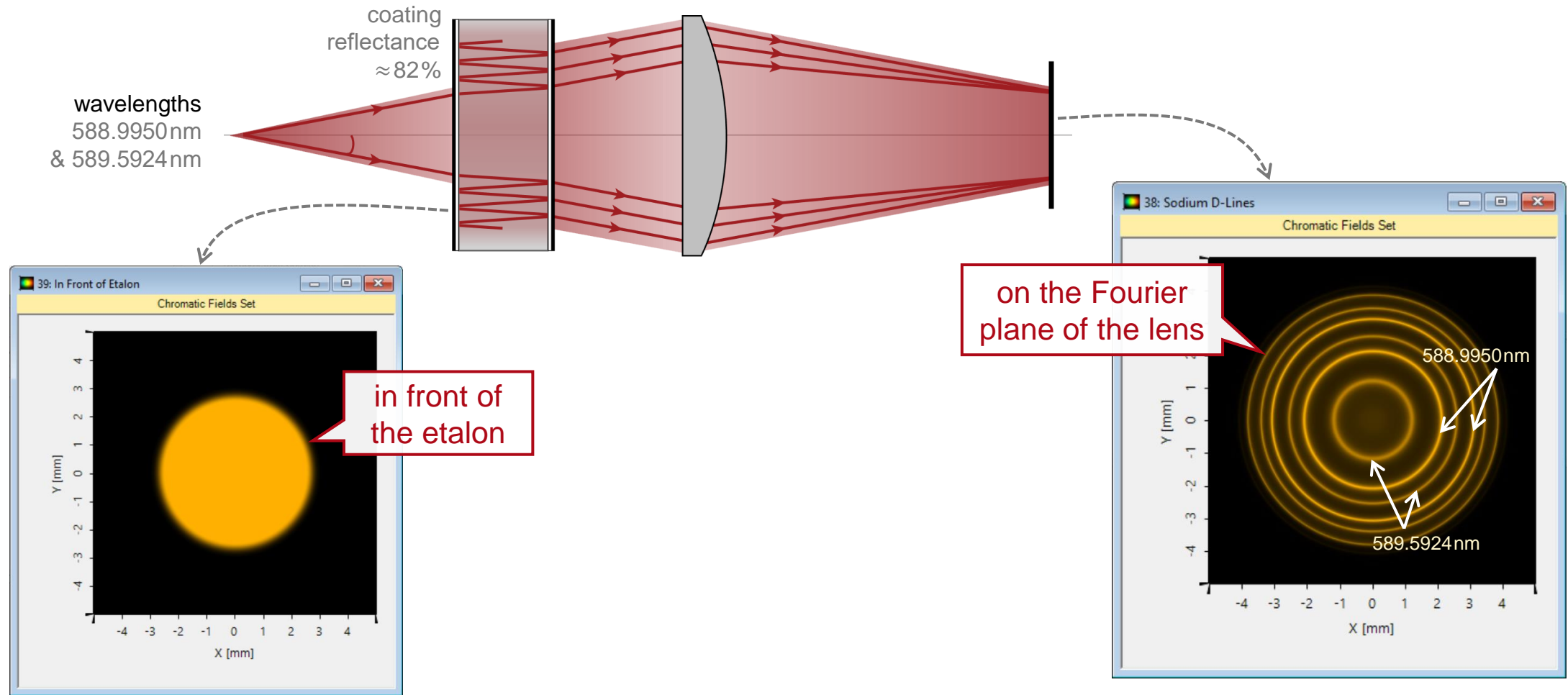


Fabry-Pérot etalons are widely used in laser resonators and spectroscopy for wavelength selection. Typically they are composed of two high-reflection (HR) coated surfaces with air or glass in between. In this example, an optical metrology system with a silica spaced etalon is set up to measure the sodium D lines in VirtualLab Fusion. With the non-sequential field tracing technique, the interference due to multiple reflections in the etalon is fully considered, and the influence from the coating reflectance on the fringe contrast is investigated.

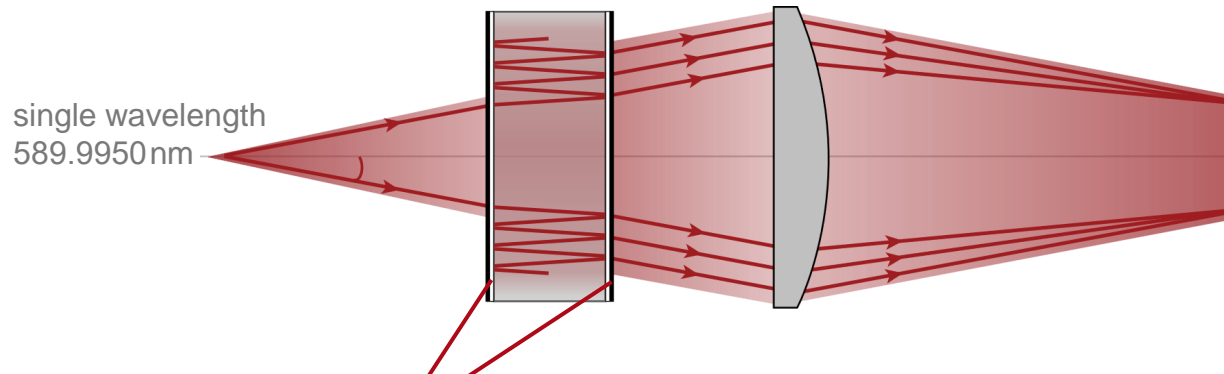
Modeling Task



Visualization of Both Spectrum Lines

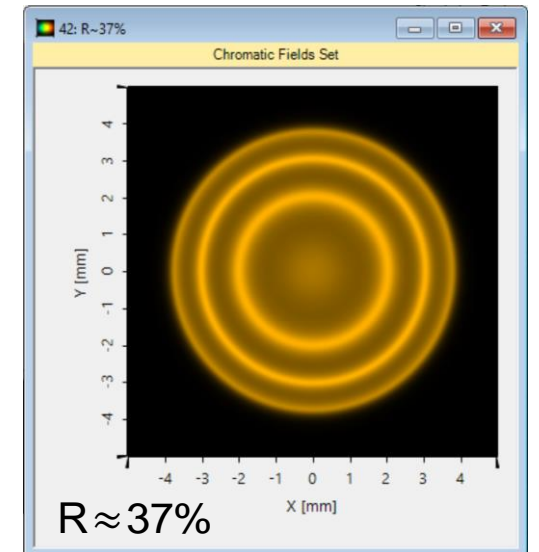
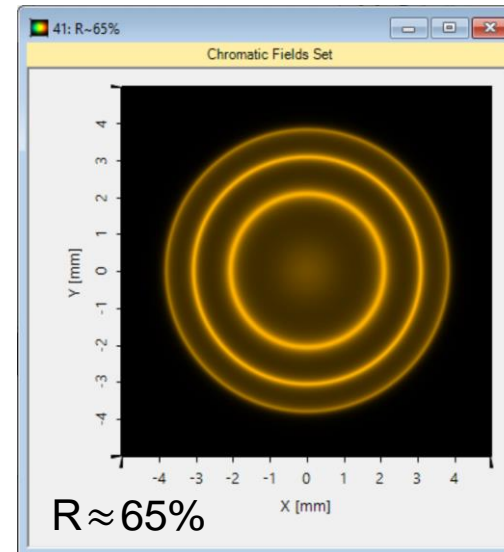
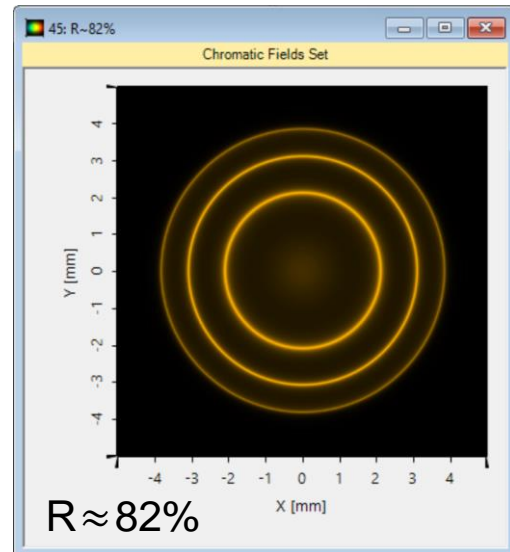


Finesse vs. Coating Reflectance



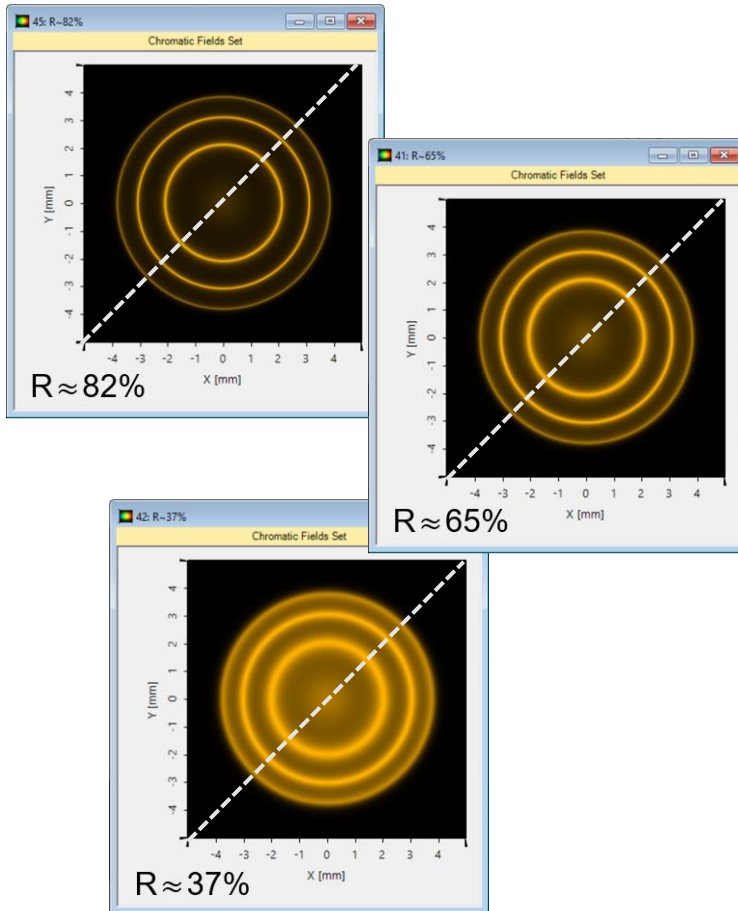
Sharpness of the interference fringes depends on the reflectance of the coatings on the etalon.

- coatings
- varying reflectance:
82%, 65%, 37%

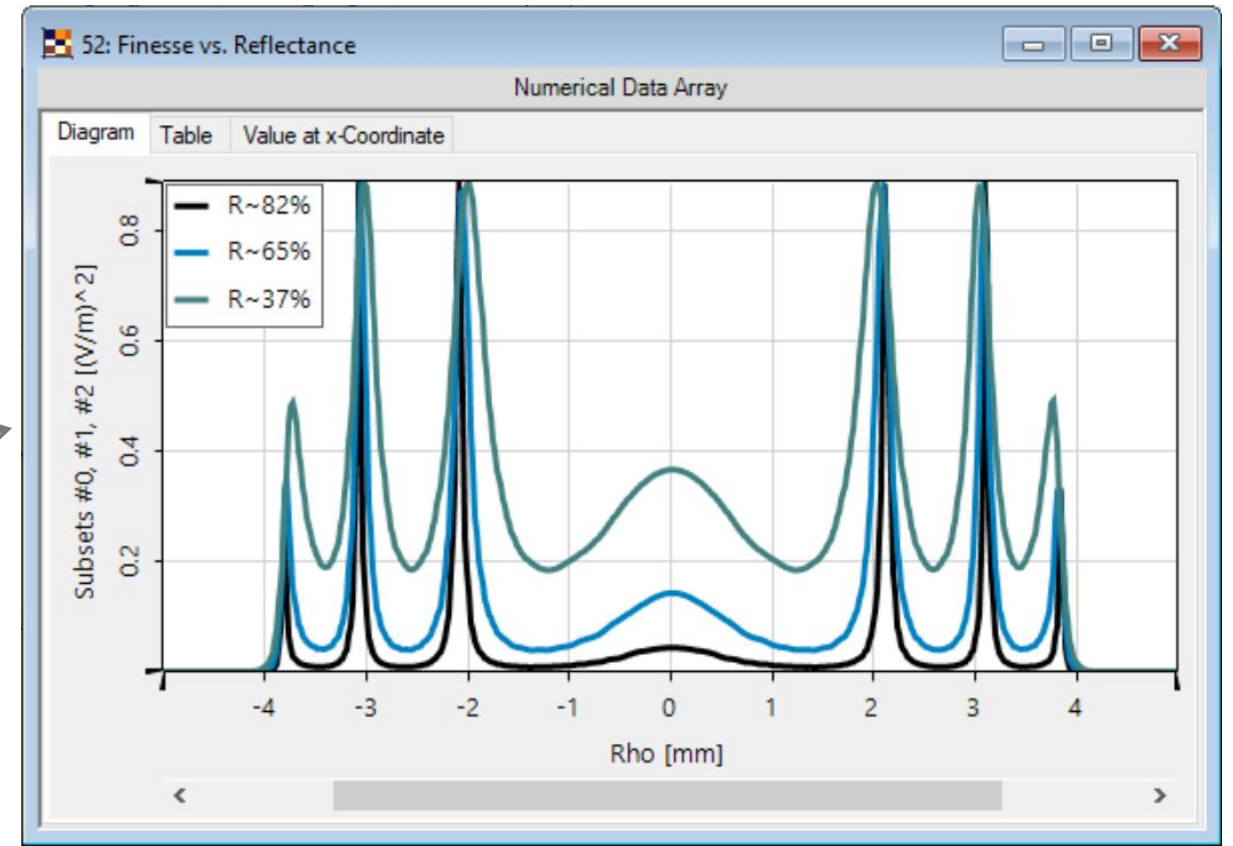


Finesse vs. Coating Reflectance

the higher the reflectance, the higher the finesse

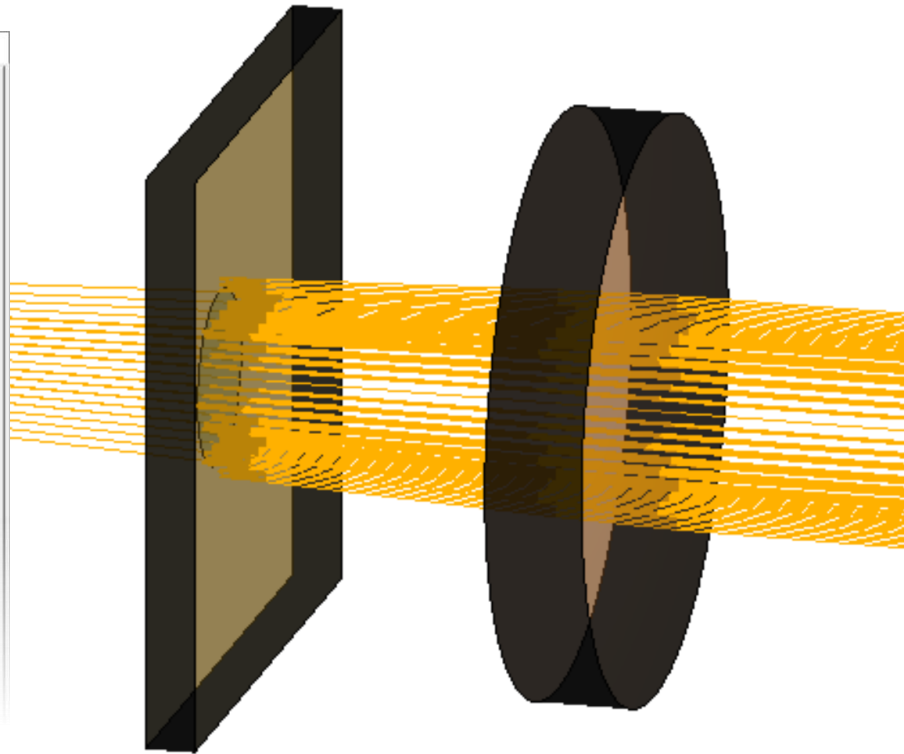
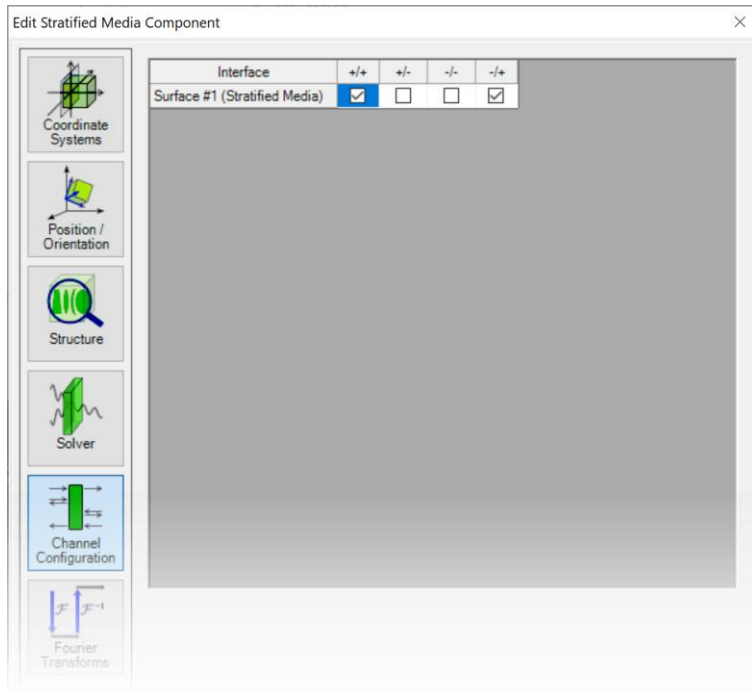


1D measurements along the radial direction



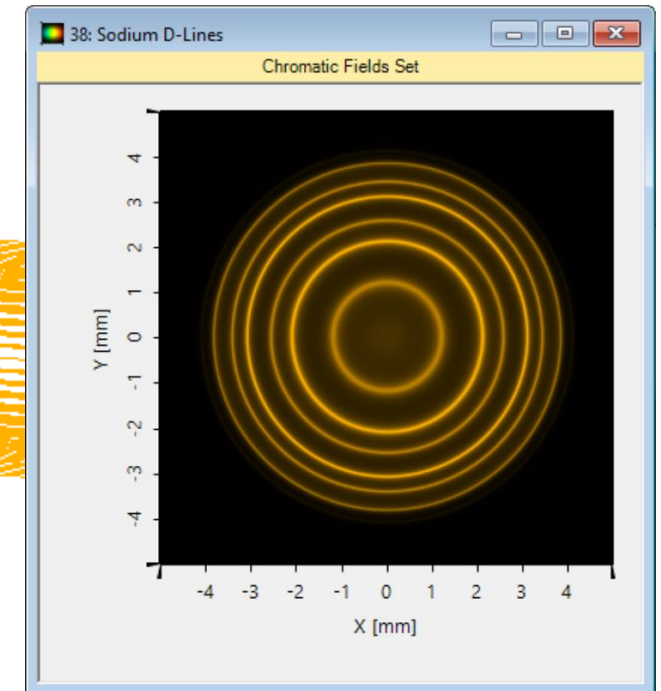
Peek into VirtualLab Fusion

flexible configuration of channels



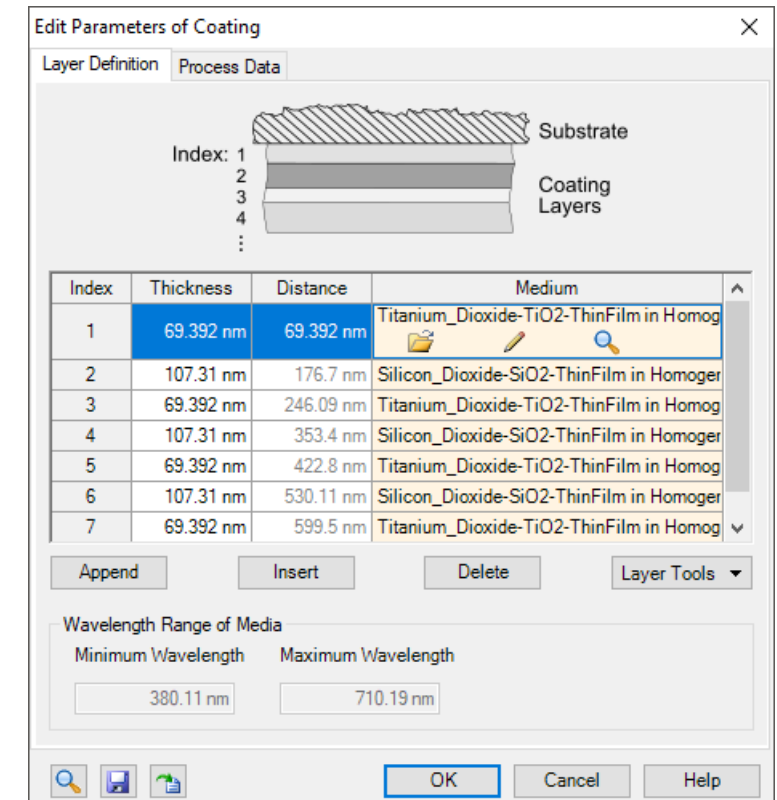
ray tracing analysis and
visualization of the optical system

visualization of interference

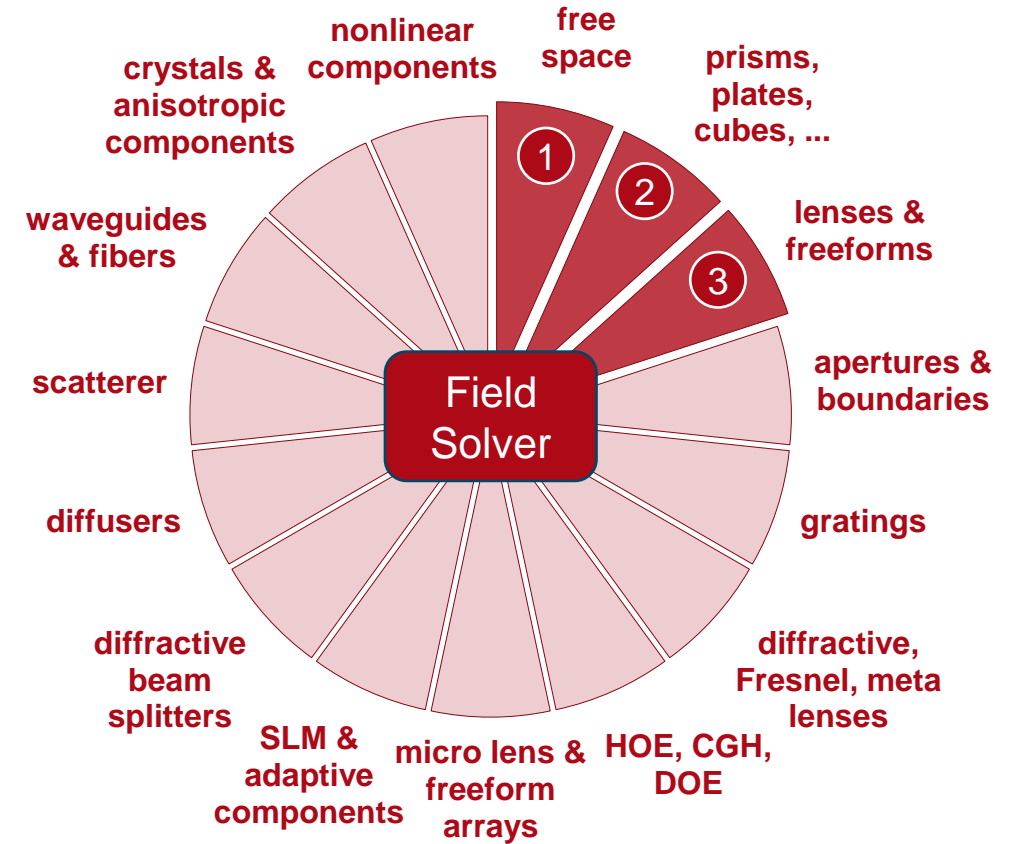
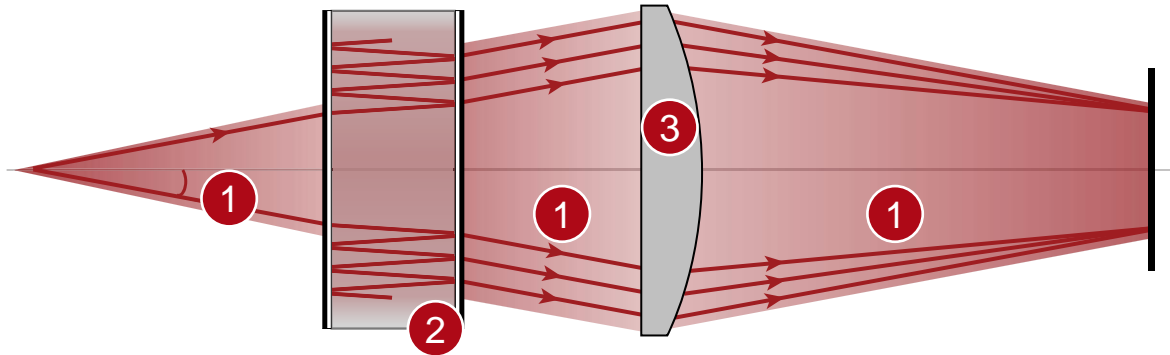


Workflow in VirtualLab Fusion

- Set up input Gaussian field
 - [Basic Source Models](#) [Tutorial Video]
- Set the position and orientation of components
 - [LPD II: Position and Orientation](#) [Tutorial Video]
- Set the HR coating
 - [Catalogs III: Coatings Catalog](#) [Tutorial Video]
- Set the non-sequential channels of components
 - [Channel Configuration for Surfaces and Grating Regions](#) [Use Case]



VirtualLab Fusion Technologies



Document Information

title	Examination of Sodium D Lines with Etalon
document code	IFO.0012
version	2.0
edition	VirtualLab Fusion Basic
software version	2020.1 (Build 1.202)
category	Application Use Case
further reading	<ul style="list-style-type: none">- <u>Modeling of Etalon with Planar or Curved Surfaces</u>- <u>Coherence Measurement Using Michelson Interferometer and Fourier Transform Spectroscopy</u>