WYROWSKI PHOTONICS

Feature.0024

Usage of Field Curvature Analyzer

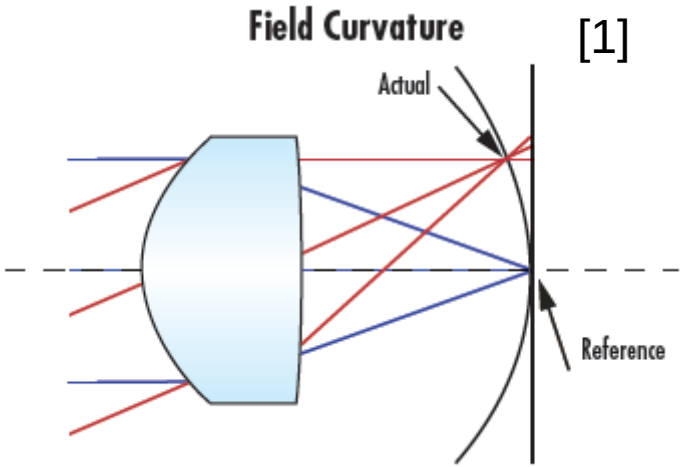
Precise analysis of field curvature of a lens component. The plotting of field curvature versus angles can be obtained easily.

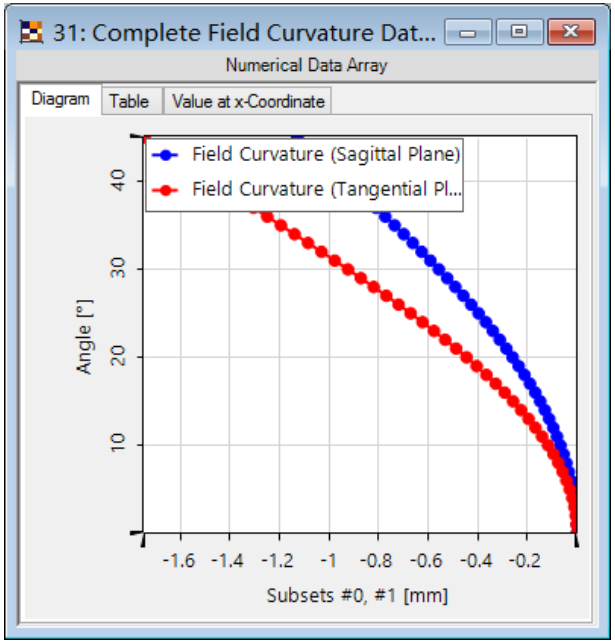
About This Use Case

- The following toolbox is required:
  - Starter toolbox
- This use case is created by using VirtualLab Fusion (Build 7.0.0.35).
- Get your free Trial Version here!

This Use Case Shows ...

- definition of field curvature
- setting of the field curvature analyzer in VirtualLab
- numerical example

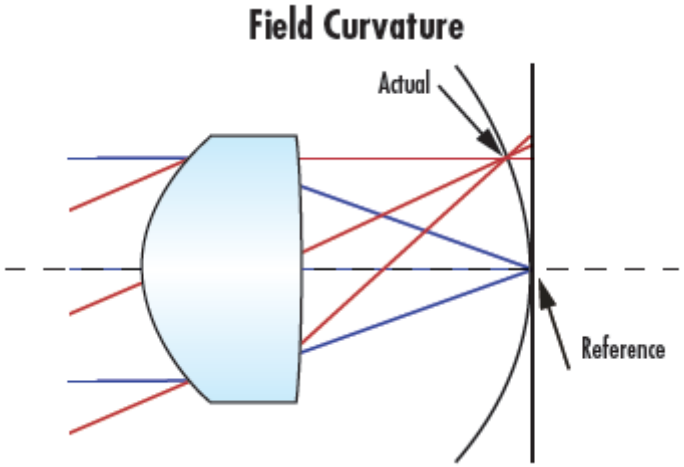




[1] https://www.edmundoptics.eu

What is Field Curvature?

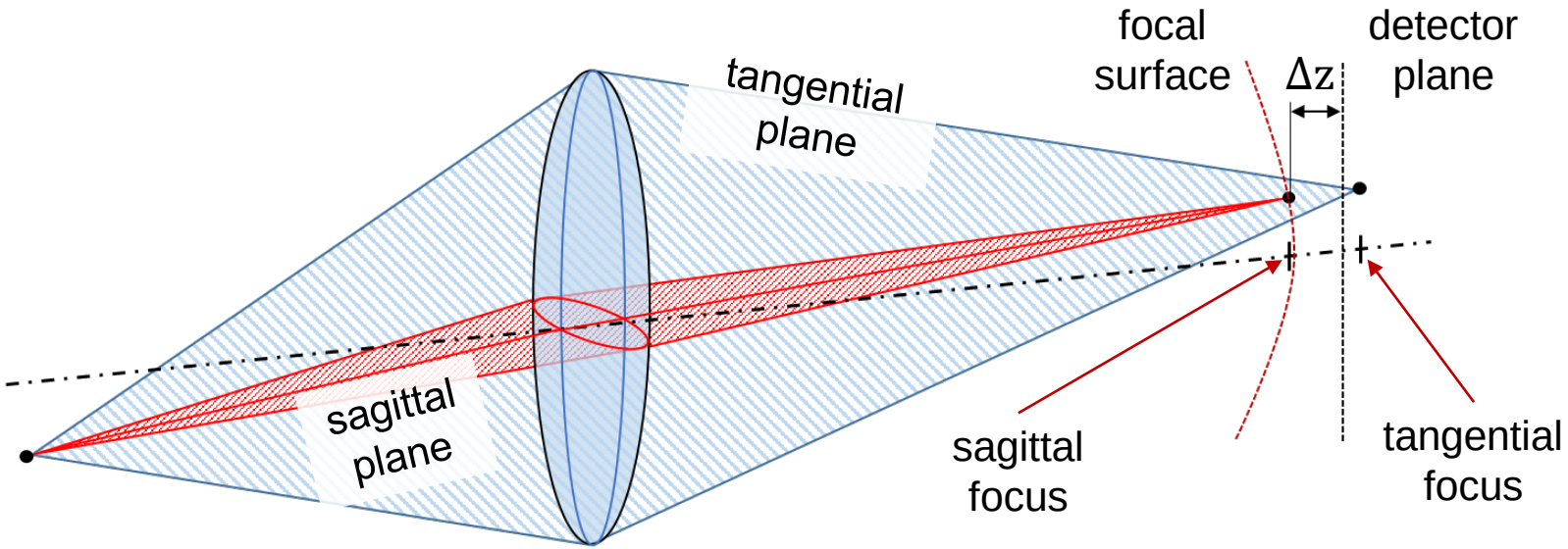
- Field Curvature, also known as “curvature of field” is a common optical problem that causes a flat object to appear sharp in a certain part(s) of the frame, instead of being uniformly sharp across the frame. This happens due to the curved nature of optical elements, which project the image in a curved manner, rather than flat.



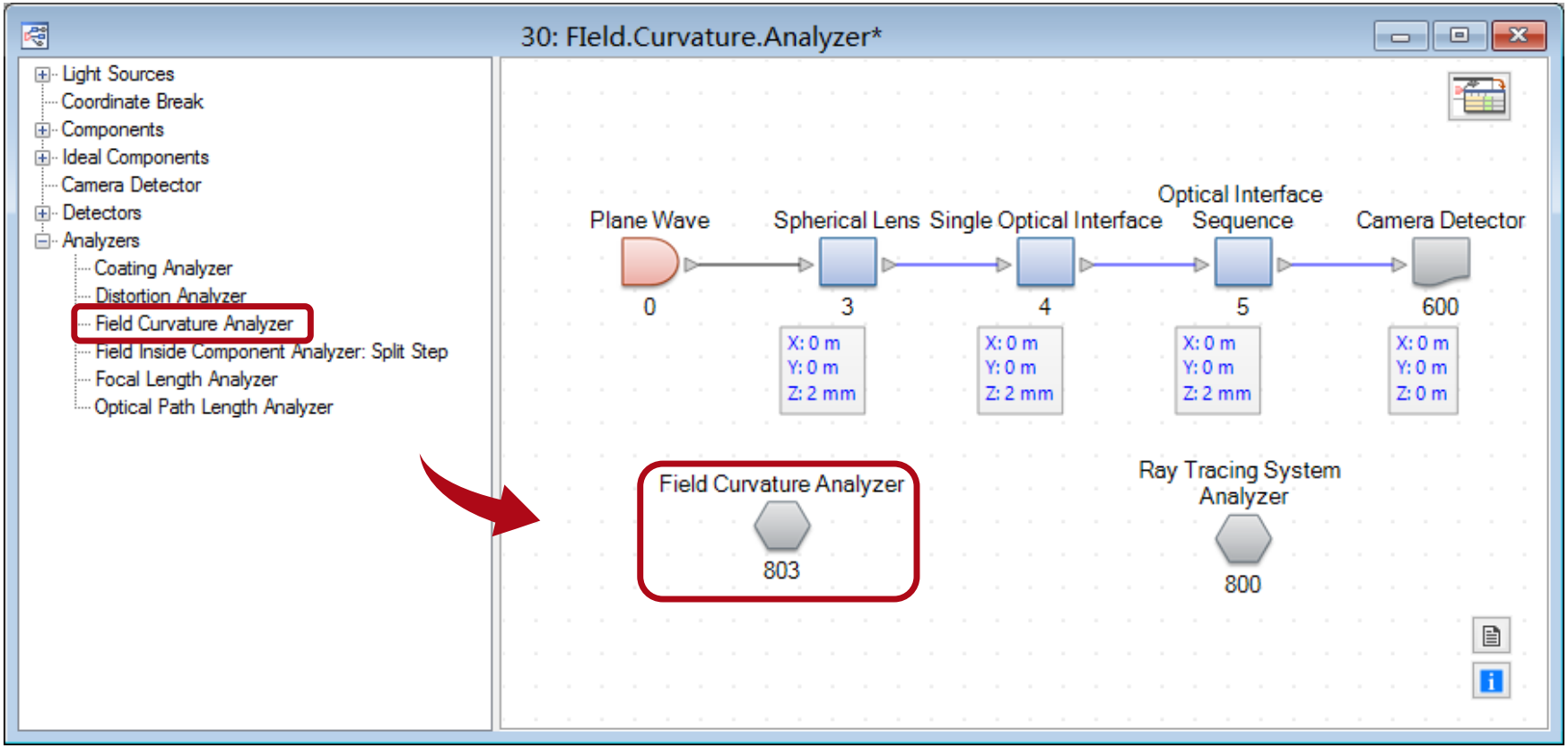
Field curvature is the aberration that describes the magnitude to which the image plane wants to be naturally curved.

Determination of Field Curvature

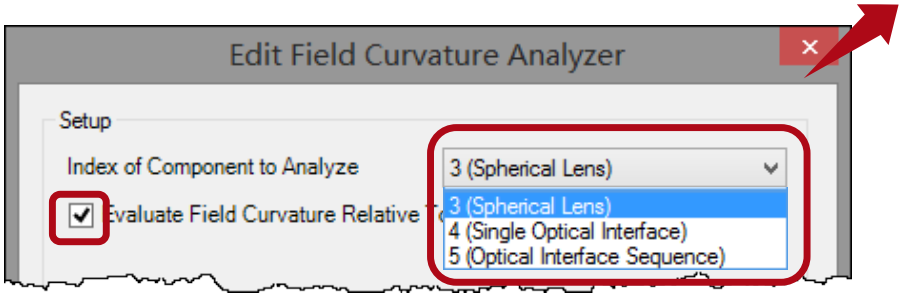
- The field curvature is measured along the z-axis (Δz is the distance between focus of the ray bundle and detector plane).
- The position of focus is determined via the RMS spot radius in two separated planes: the tangential and the sagittal plane (see figure below).
- It is a criteria for defocusing of off-axis beams regarding a flat image plane. The perfect image describes a curved surface instead. This fact has to be taken into account for example in laser scanning applications.



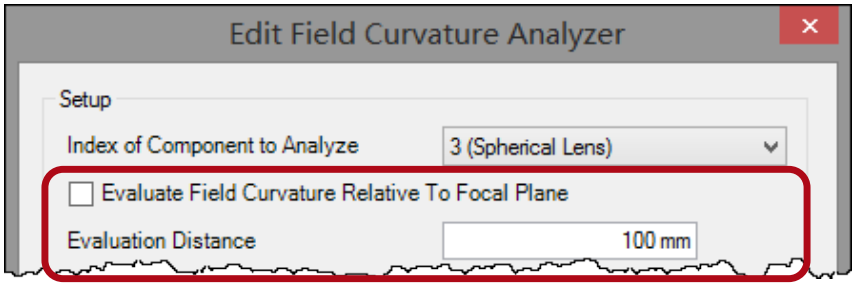
Field Curvature Analyzer in VirtualLab



Setting of the Analyzer



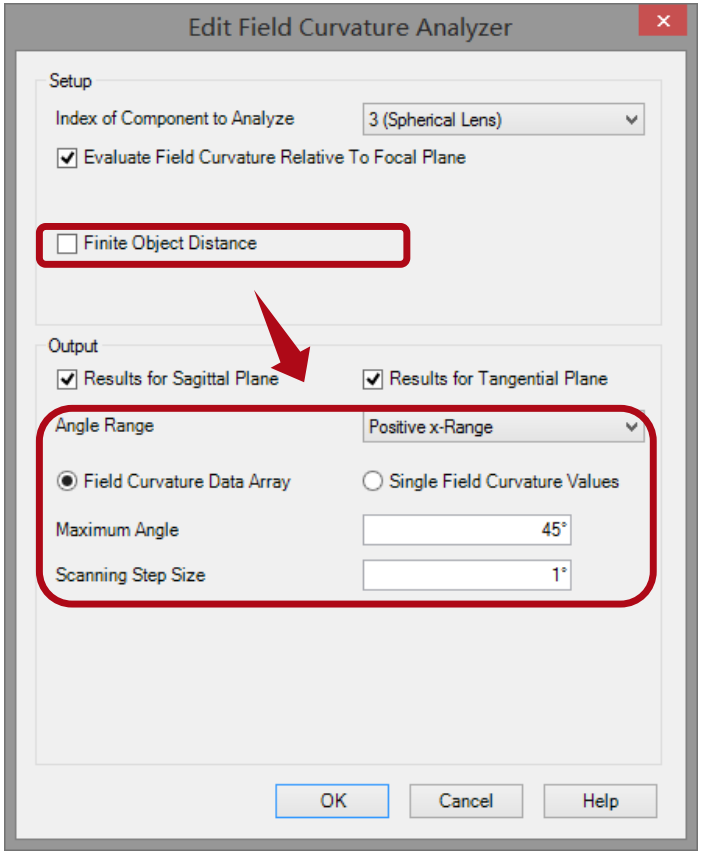
or



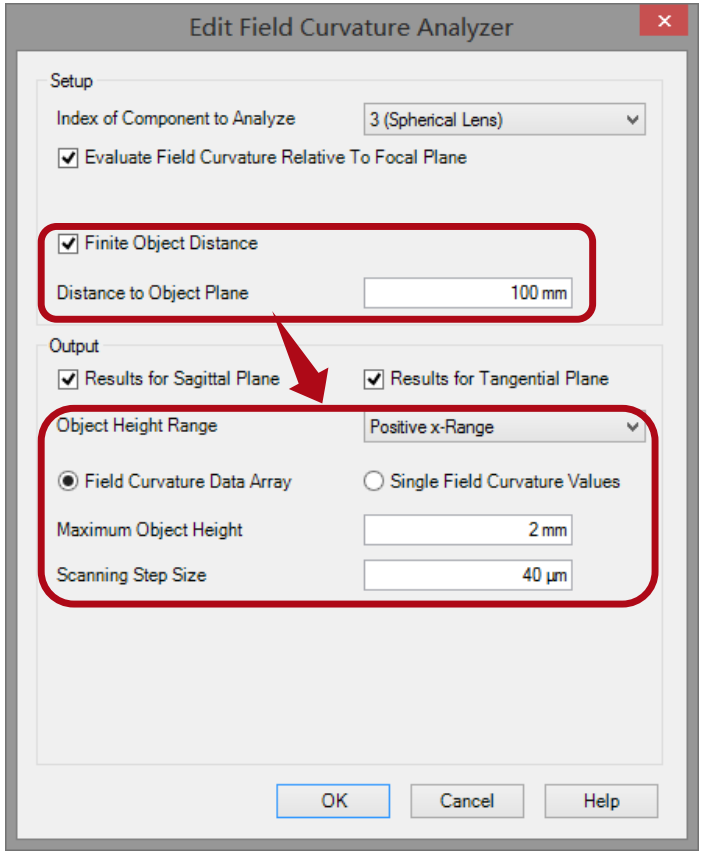
- Select a lens component to be analyzed. The analysis is independent of the system.
- Check the option to set the detector plane at effective focal length
- Determine the *Evaluation Distance* according to user's requirement

Setting of the Analyzer

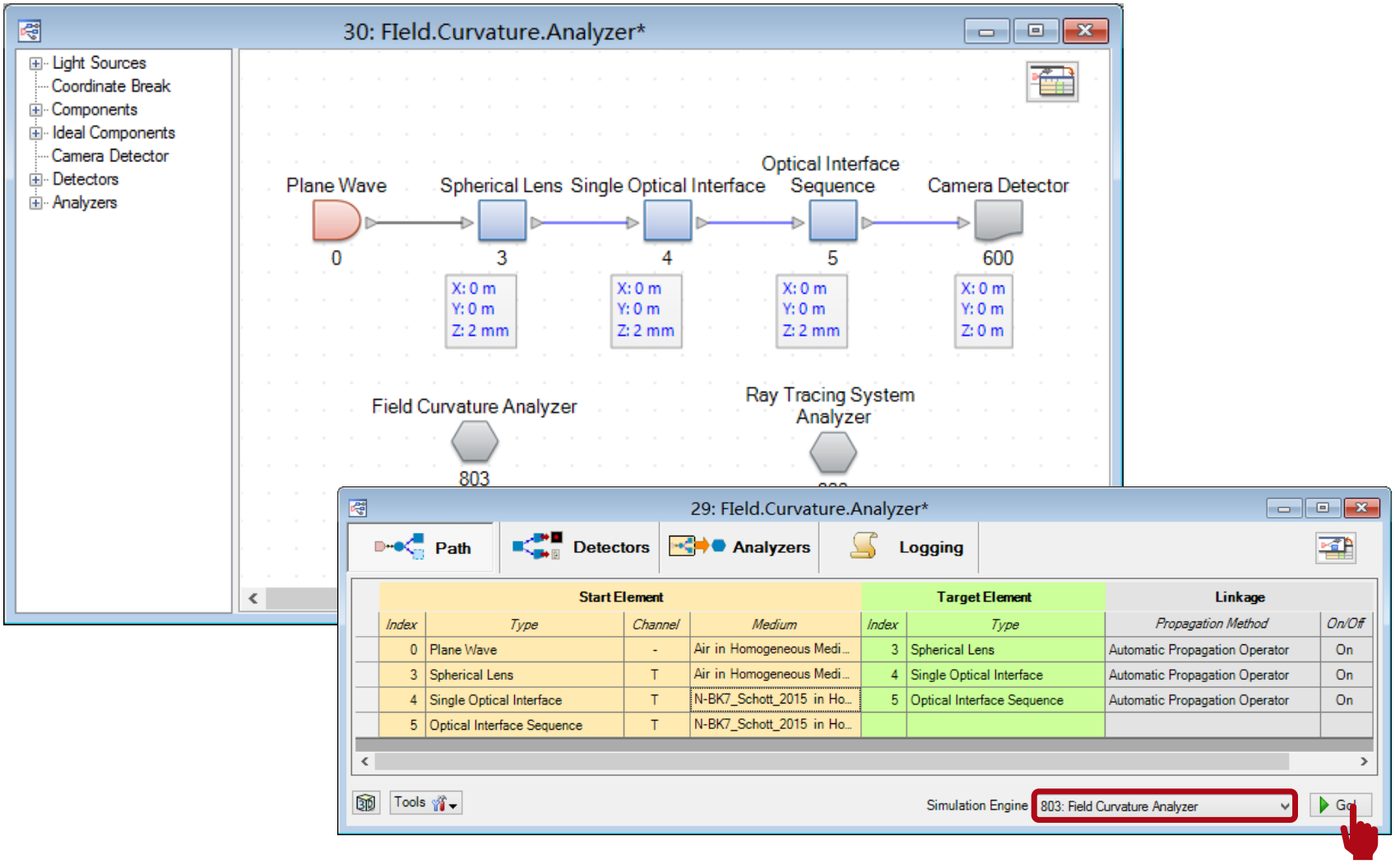
Field Curvature vs. Angle



Field Curvature vs. Object Height

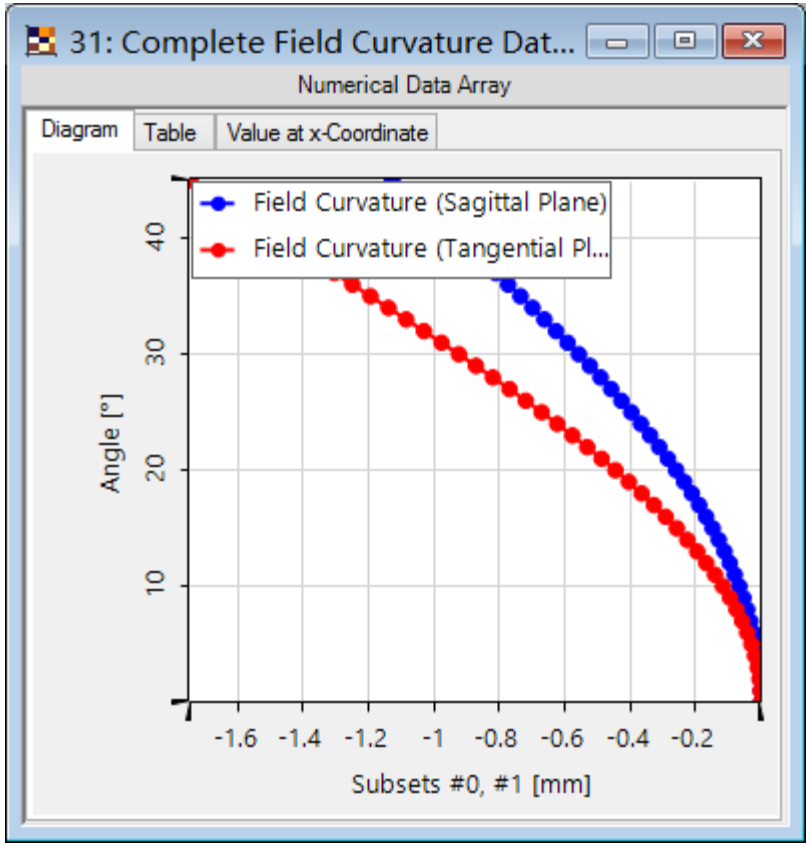


Field Curvature of Spherical Lens

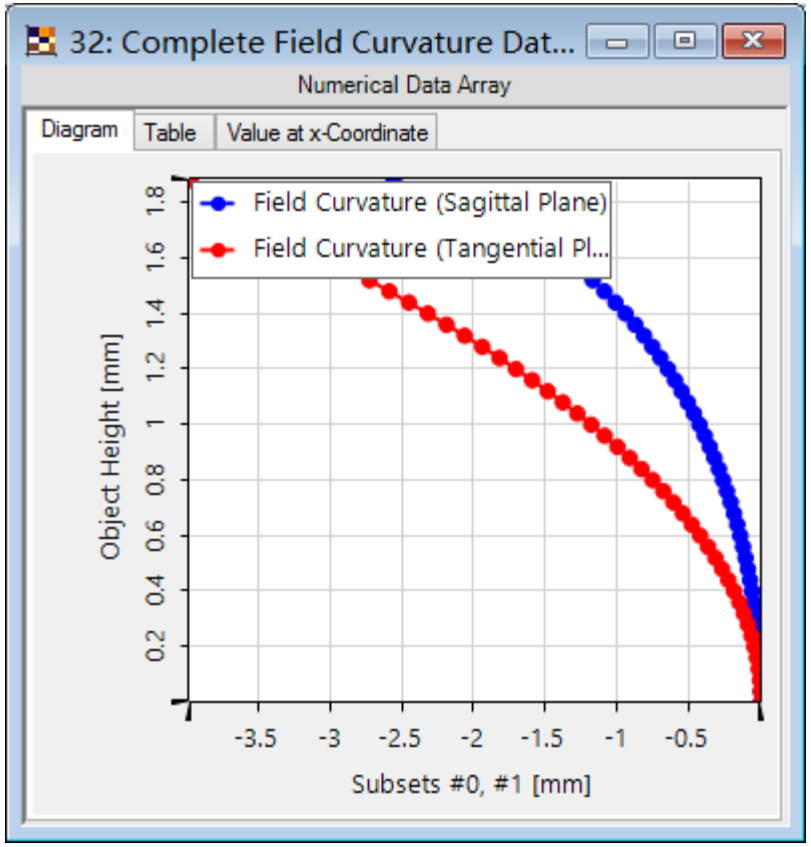


Field Curvature of Spherical Lens

Field Curvature vs. Angle



Field Curvature vs. Object Height



Document & Technical Info

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