# Import Optical Systems from Zemax OpticStudio®

Abstract
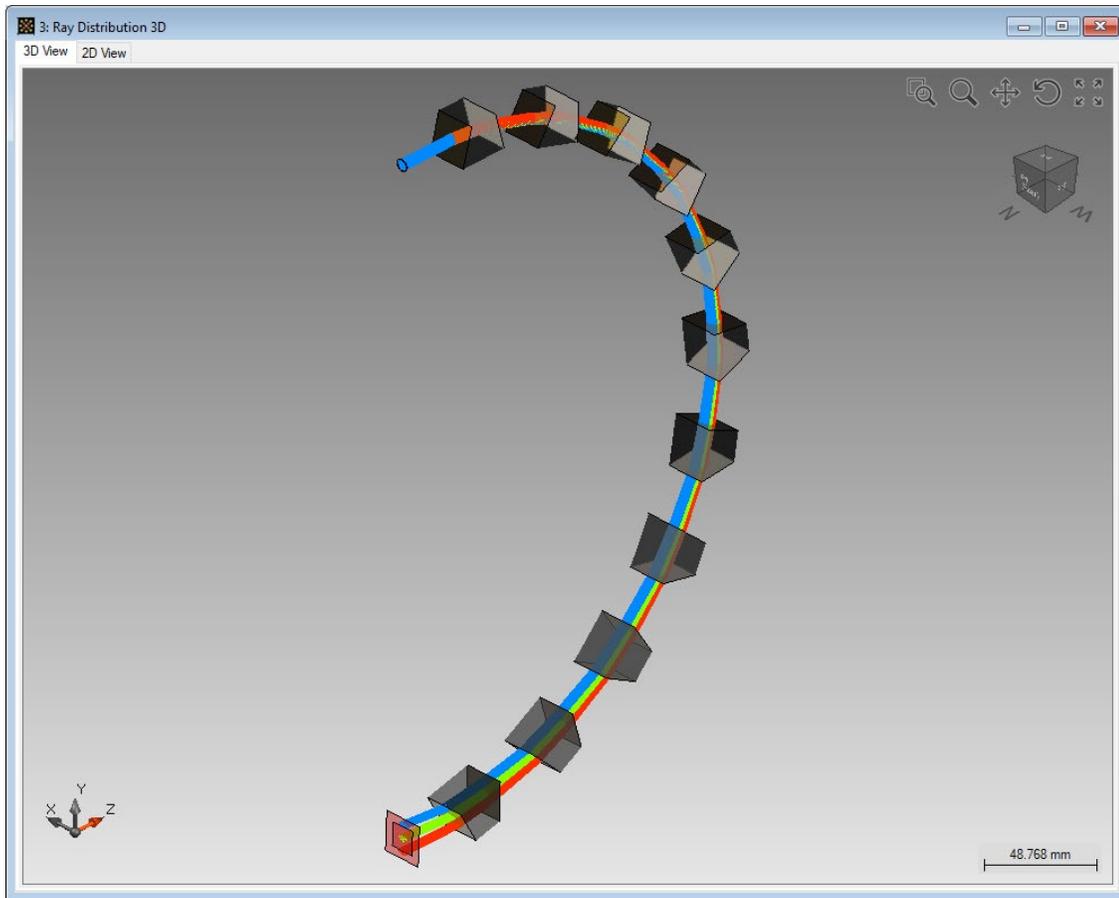
Zemax OpticStudio® is a well-distributed ray tracing software. VirtualLab Fusion allows to import optical systems with full 3D position information and glasses from Zemax OpticStudio®. After the import, the structure data of the optical system will be shown either as single surfaces, or can be combined into components in VirtualLab Fusion. One can perform ray tracing simulation of the imported optical system, and more importantly, field tracing could be performed to further analyze the system.

Pre-processing for Zemax Import

- Zemax OpticStudio® installation is required in the user's PC (minimum version 15.5 SP2).

- A valid license for Zemax OpticStudio® is required (the dongle needs to be plugged in).

- In the Global Options Dialog of VirtualLab Fusion, please set the Path for Zemax OpticStudio® User Data to the address where the "Glasscat" folder from Zemax is located.
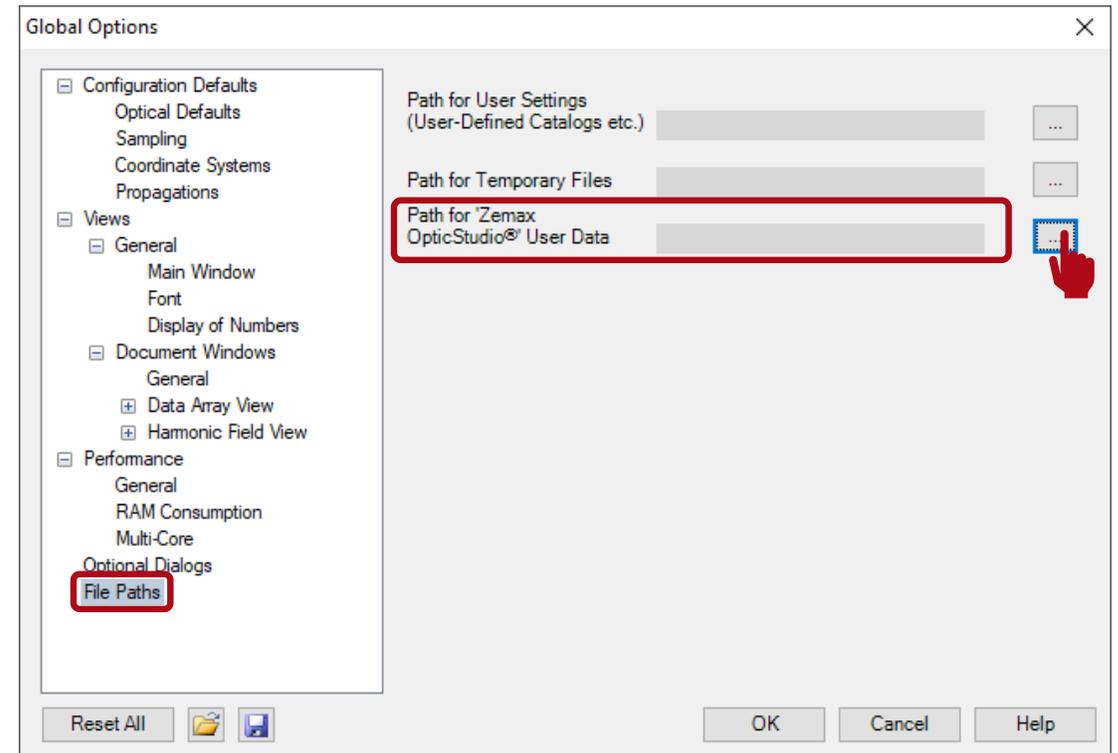
Import Zemax OpticStudio® System
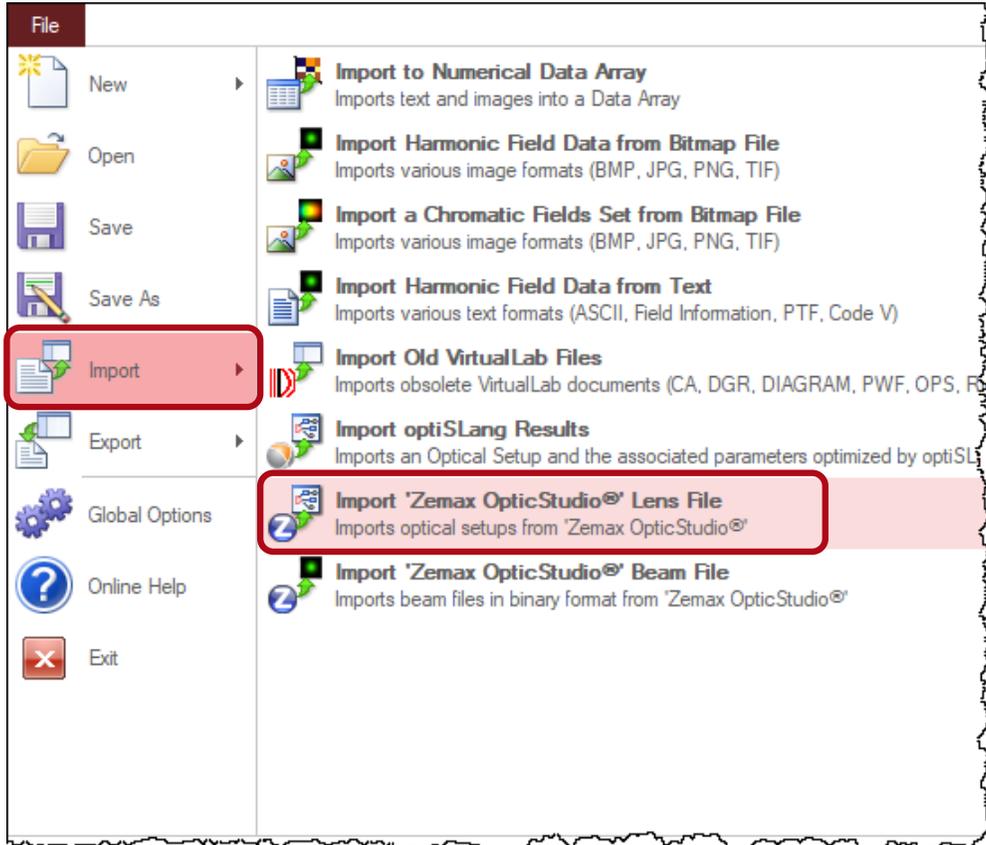
In VirtualLab Fusion, Zemax OpticStudio® files can be imported via the following steps:

- File ➔ Import ➔ Import Zemax OpticStudio® System

- Then open the Zemax system sample file with ".ZMX" extension, which contains the structure data.

- Alternatively, you may drag and drop the Zemax file into VirtualLab and perform the import.

Import Zemax OpticStudio® System

- Every interface in Zemax OpticStudio® data corresponds to a Single Interface Components in VirtualLab Fusion.

- If the system to be imported contains more than one interfaces, a popup window appears during the import and asks if the interfaces shall be combined as Optical Interface Sequence (OIS) Component.

Combination of Components   ✕

?   Do you want to combine the Single Interface Components to Optical Interface Sequence Component(s)?

Yes   No
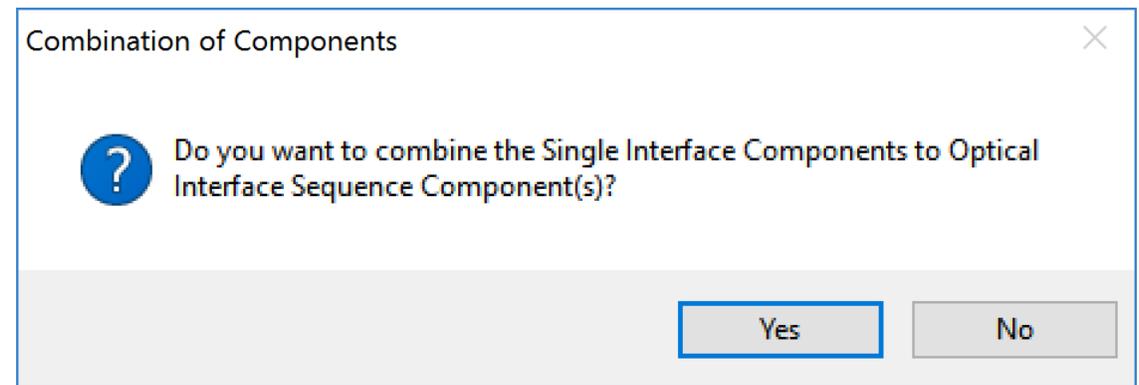
Import Zemax OpticStudio® System

- By default, VirtualLab Fusion will suggest combining the interfaces between the coordinate breaks into single OIS component, as they usually are in reality.

- The coordinate information will be automatically translated during the import, and the imported optical setup in VirtualLab Fusion shall contain the correct positioning information.
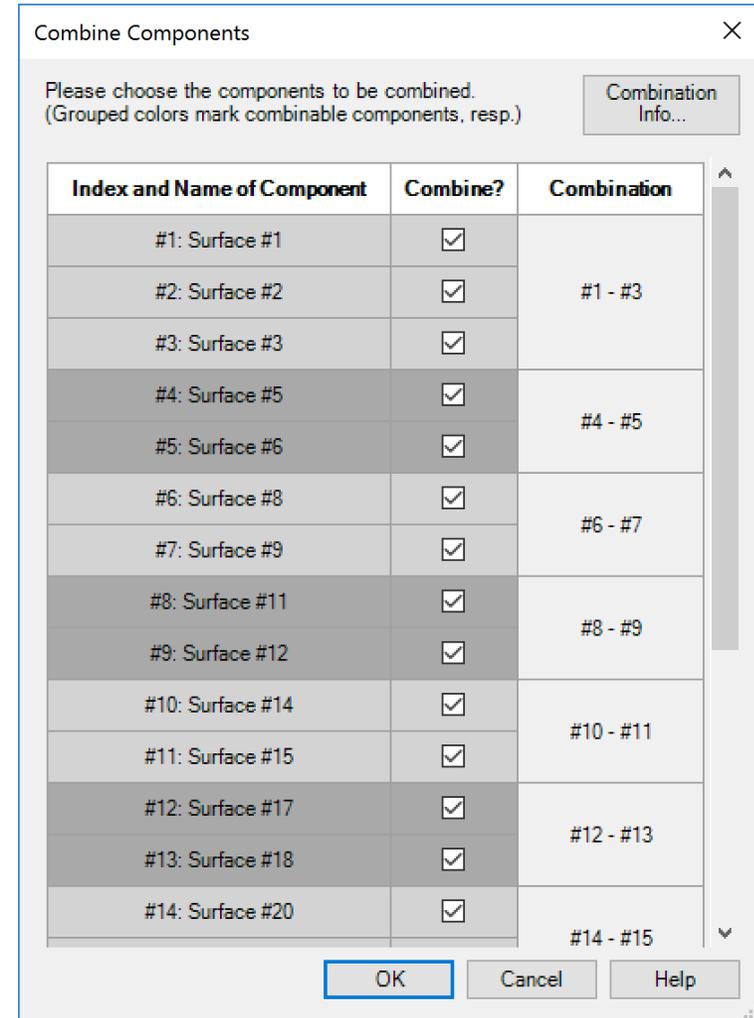
Construct the Optical System

- After combining the interfaces, the original optical system from Zemax OpticStudio® is shown as several OIS components in the optical setup in VirtualLab Fusion.

- A default Plane Wave source is used, with its spectrum initialized according to the wavelengths from Zemax OpticStudio® file, and with its size defined according to the entrance pupil diameter.

Remark: VirtualLab Fusion also adds a Raw Data Detector and a Spot Size detector right behind the image plane.
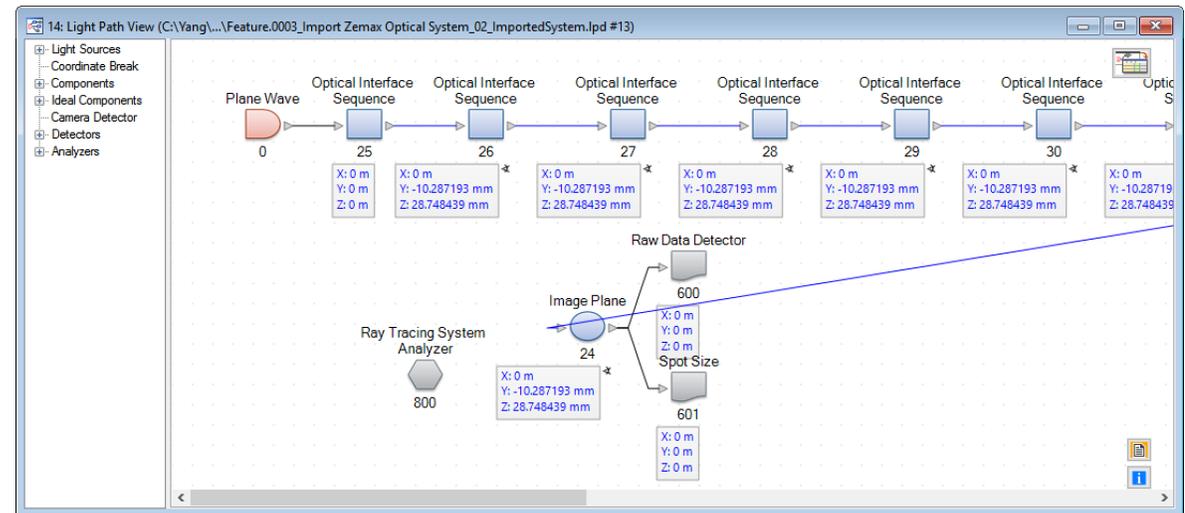
* The Zemax sample file used in this use case is downloaded from Zemax Knowledgebase

Simulation Result – 3D Ray Tracing

- We begin with the ray tracing system analyzer, and the obtained results in VirtualLab and Zemax OpticStudio® are comparable.
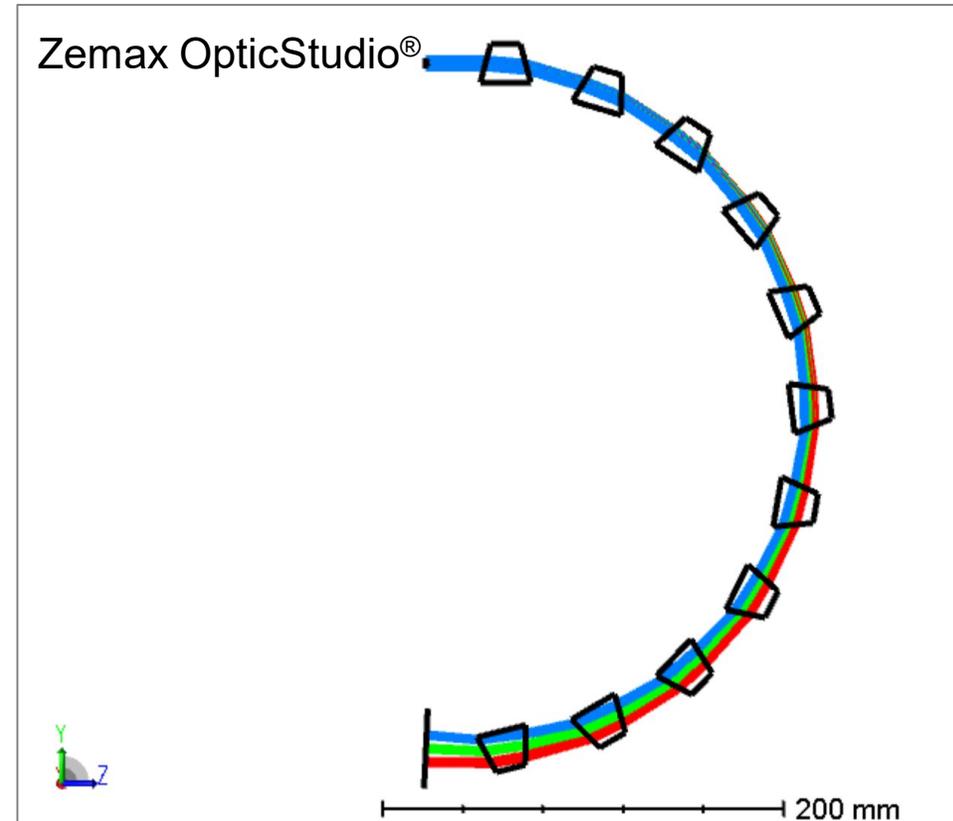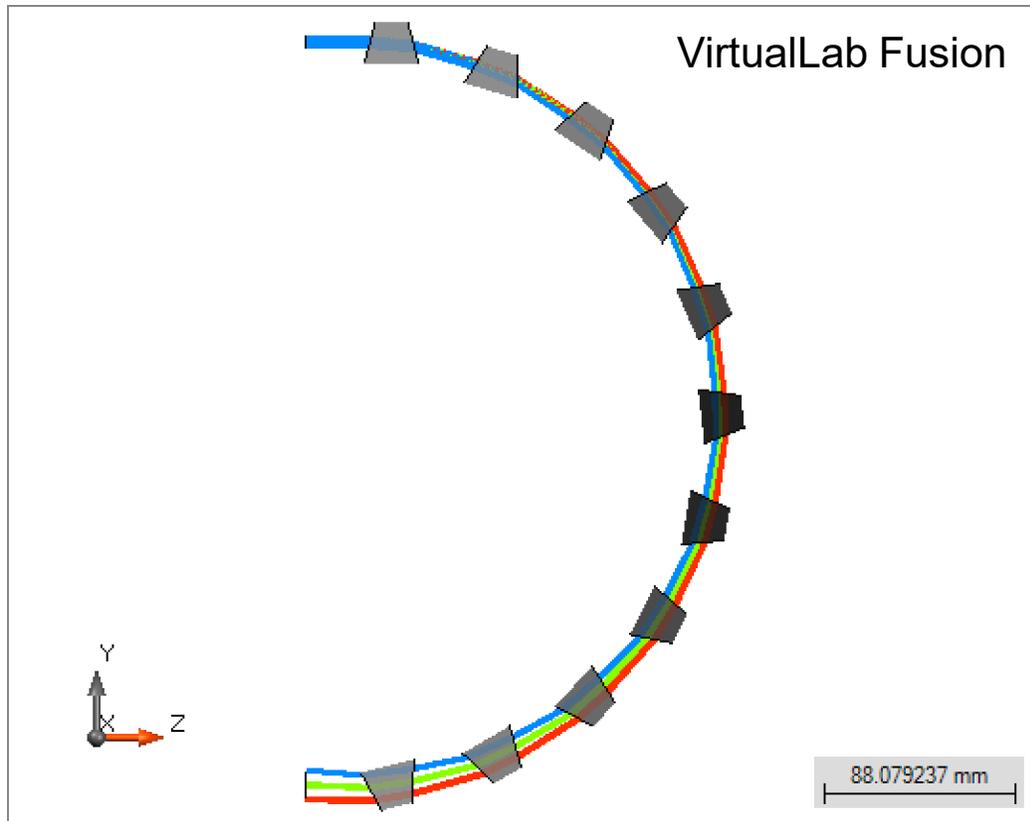
# Simulation Result – 2D Ray Tracing

- Then, by running the ray tracing simulation, the result obtained in VirtualLab is also in accordance with the result of Zemax OpticStudio®.

dot diagram in VirtualLab Fusion

dot diagram in Zemax OpticStudio®
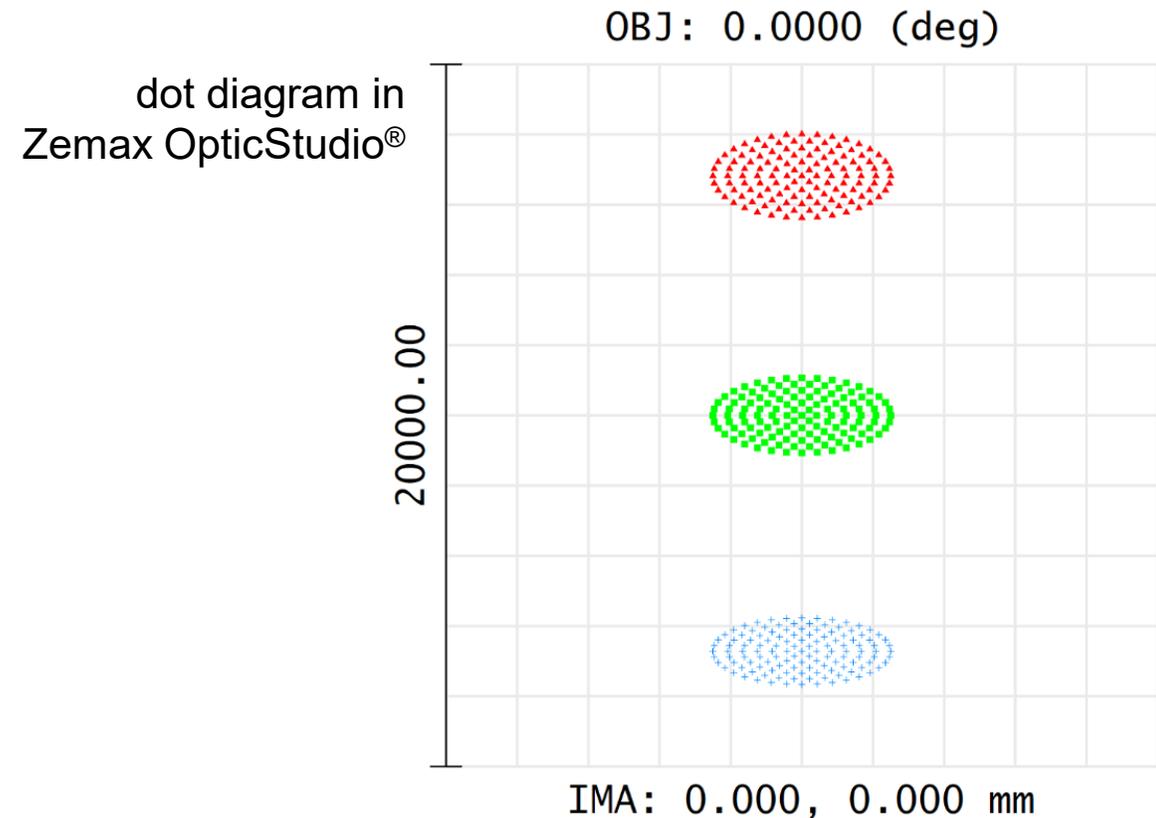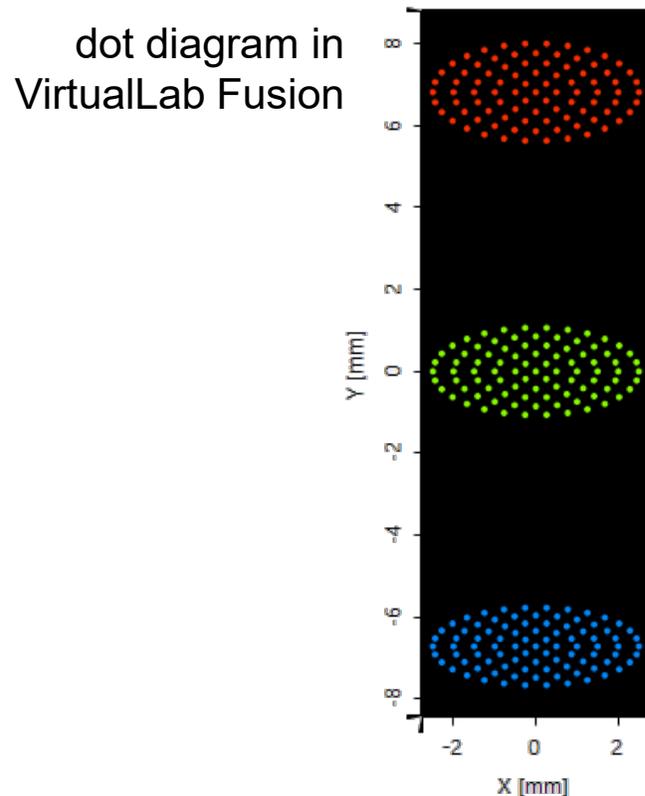
Simulation Result – Field Tracing

- To include also field information and additional propagation effects (like diffraction) you may simply switch to the Field Tracing Engine in VirtualLab Fusion.

intensity distribution calculated in VirtualLab Fusion (real-color display)

zoomed view in central region (false color display)

Diffraction is included in the simulation.
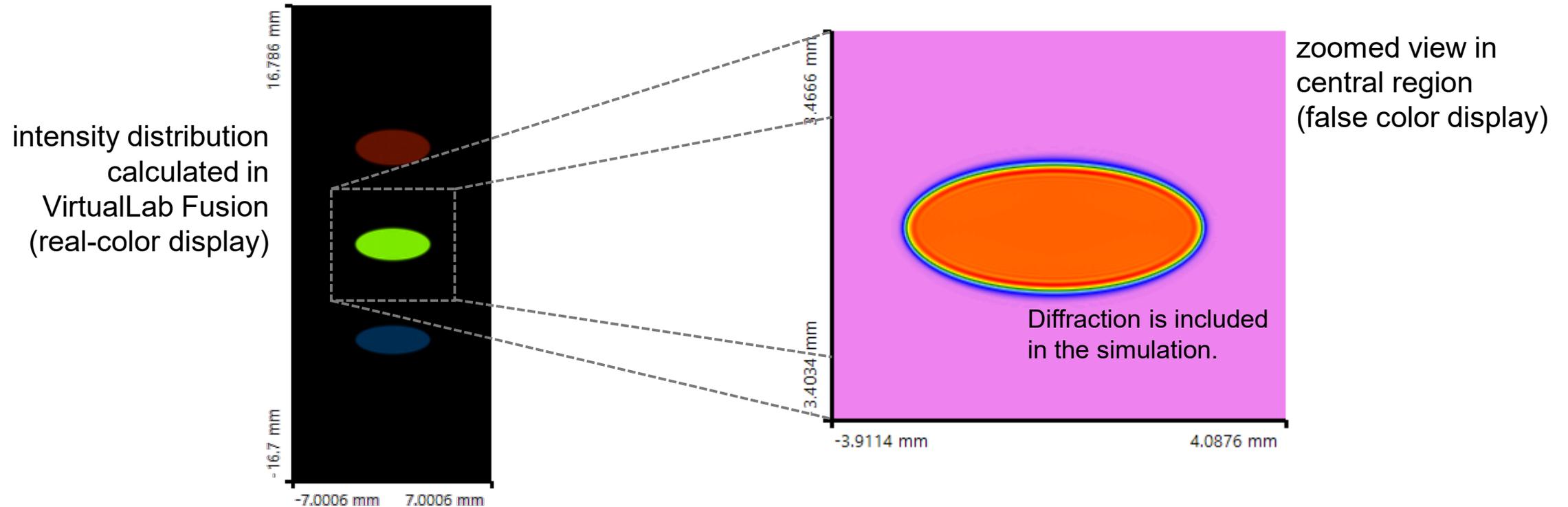
Document Information

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category	Feature Use Case
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