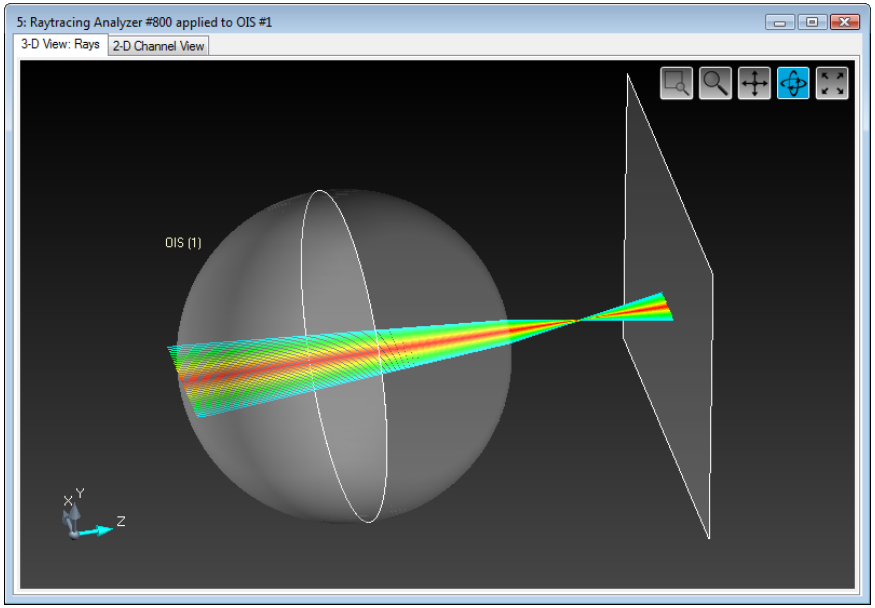
Introduction to the Raytracing Analyzer

Analyzing the Geometrical Optics Operator with the Raytracing Analyzer

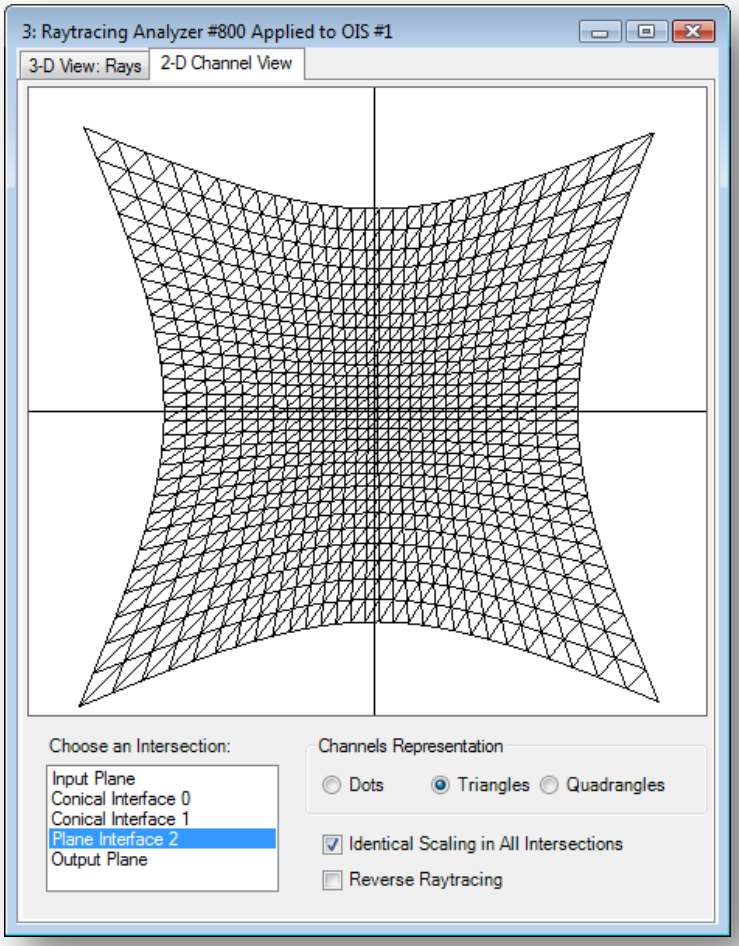
LightTrans

Raytracing Analyzer - Introduction

- With the *Raytracing Analyzer* the forward tracing of test rays (*channels*) of the *Geometrical Optics* propagation operator (*GeOp*) can be analyzed for a real component
- Test ray number (= channel number + 1) can be specified for both x- and y-direction via a ray matrix
- Rays are drawn into 3-D View that shows interfaces transparently

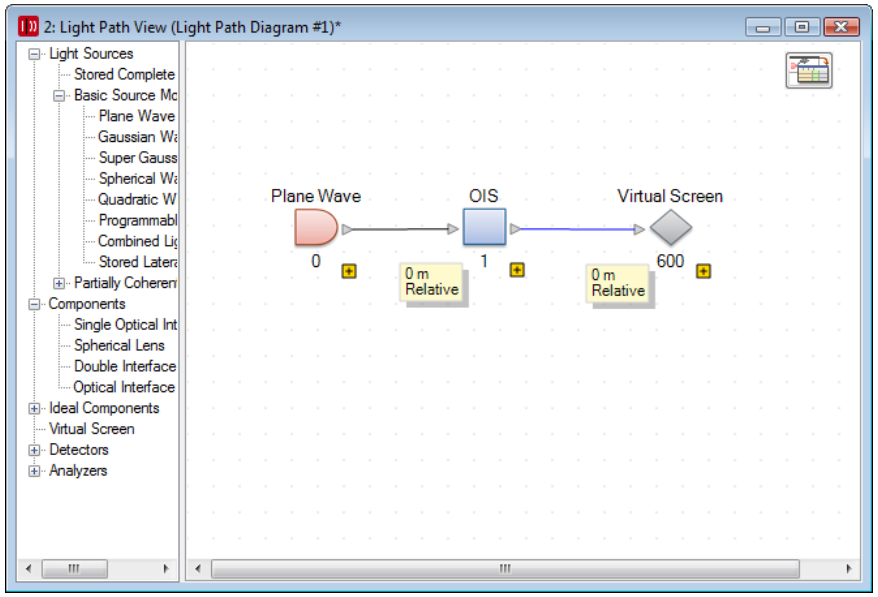


Raytracing Analyzer - Introduction



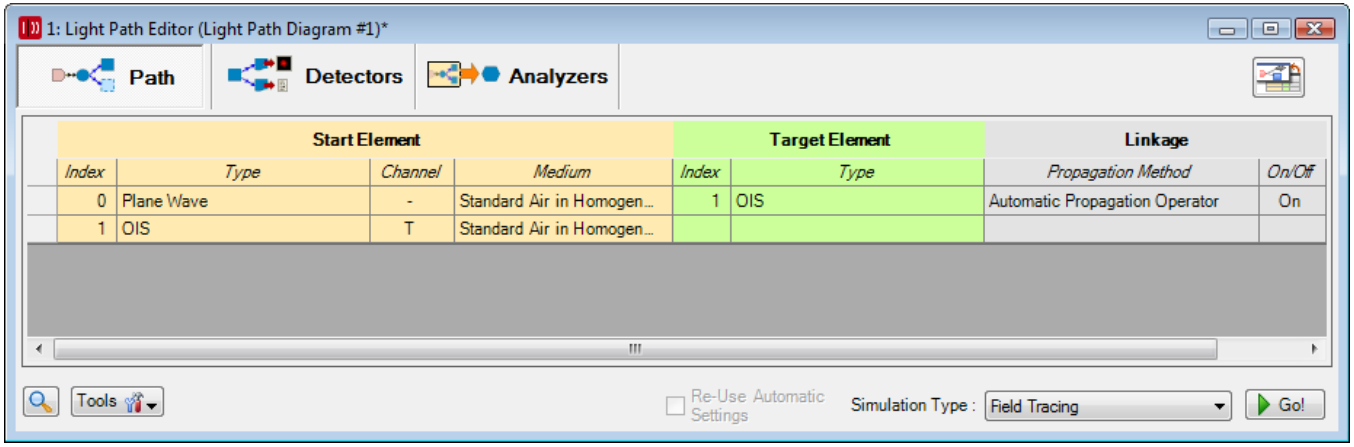
- Test rays are the vertices (mesh nodes) of the GeOp channels
- On the 2-D Channel View the channel meshes can be explored for all interfaces and the input and output plane
- Channel representation as dots, triangles or quadrangles in the 2-D View

1. Create Appropriate Light Path Diagram

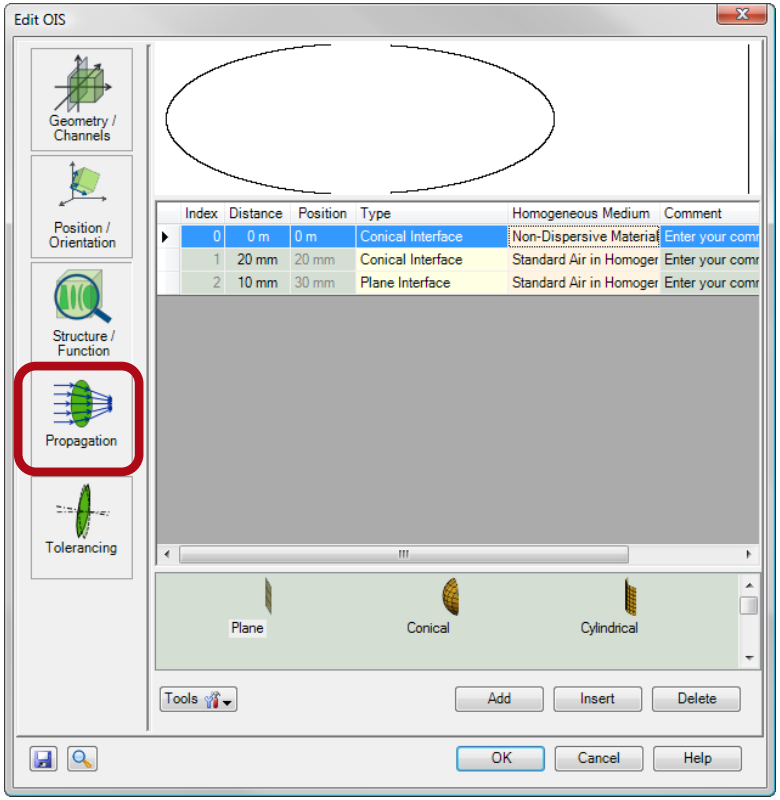


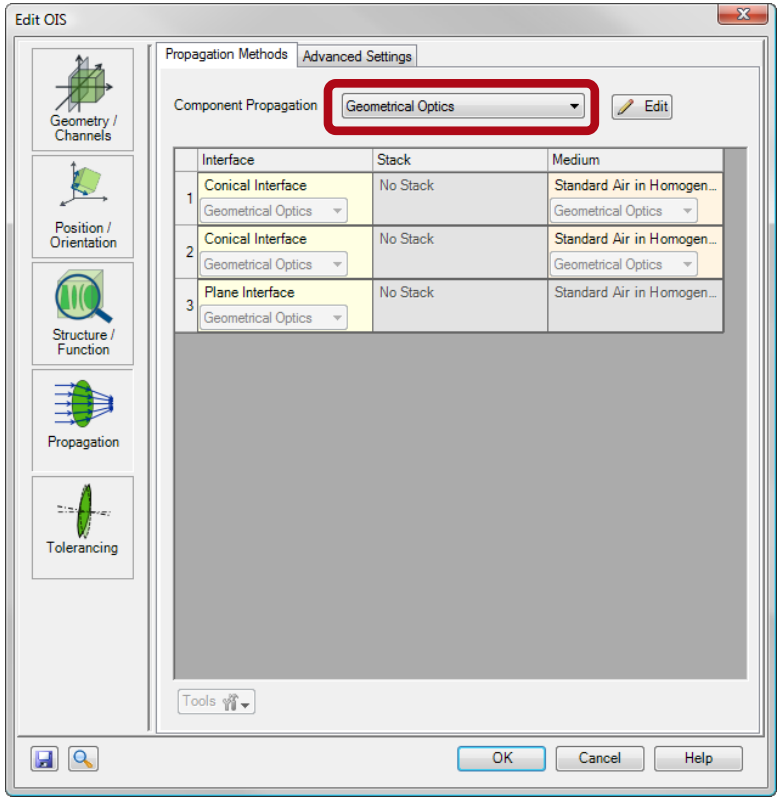
Create a Light Path Diagram containing an *Optical Interface Sequence (OIS)* component

(see Tutorial *FS.001* "Introduction to the Light Path Diagram")



1. Create Appropriate Light Path Diagram



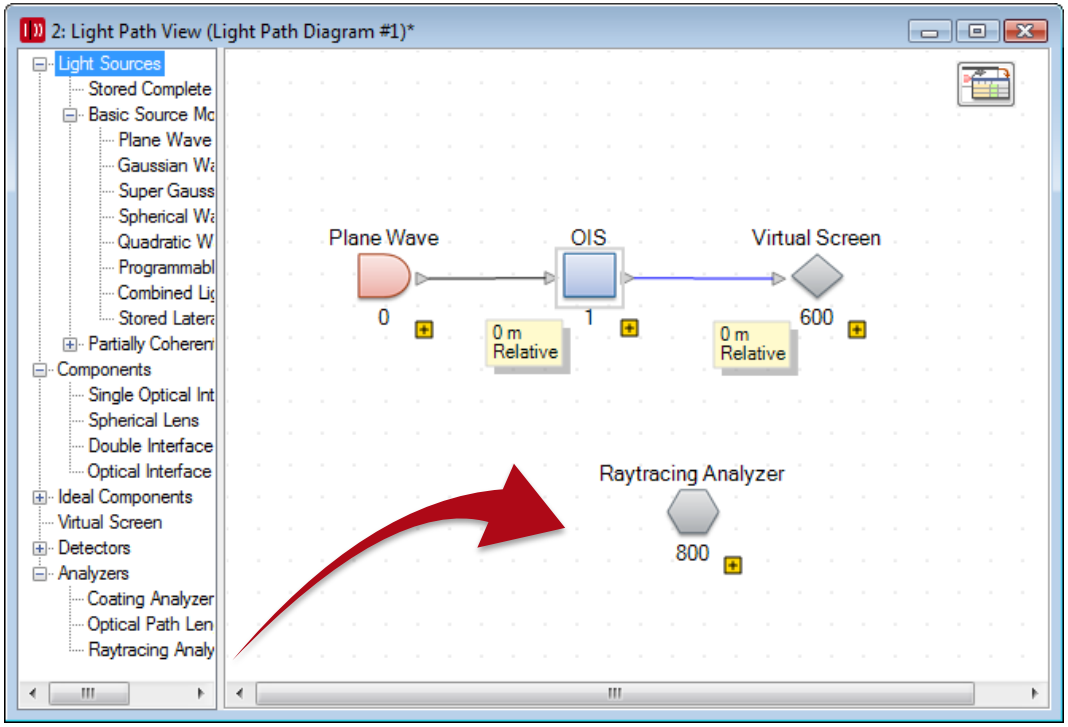


Edit the OIS (via double click on component):

Be sure that the *Geometrical Optics Operator (GeOp)* is chosen as *Component Propagation* (see right image)

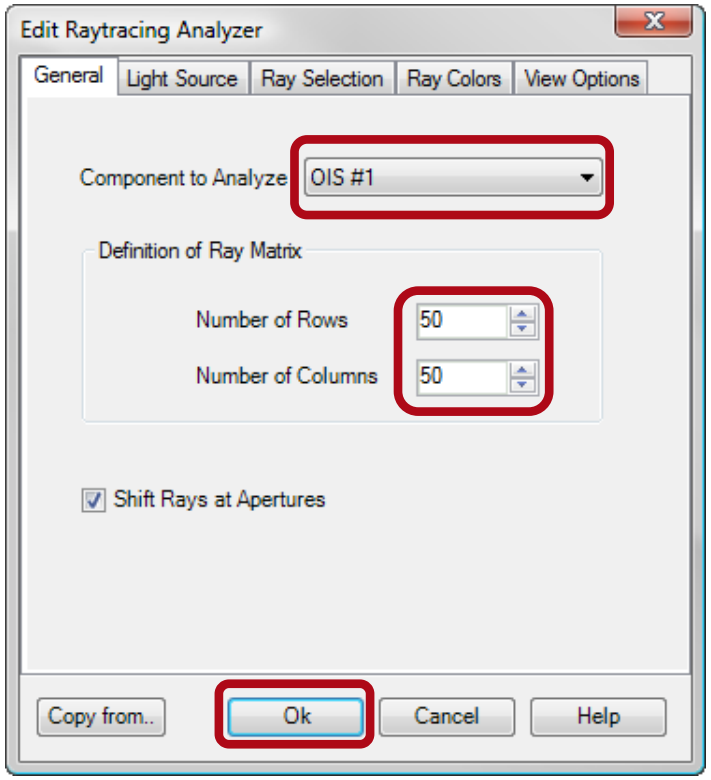
1. Create Appropriate Light Path Diagram

Add a *Raytracing Analyzer* element to the LPD:



2. Edit the Raytracing Analyzer

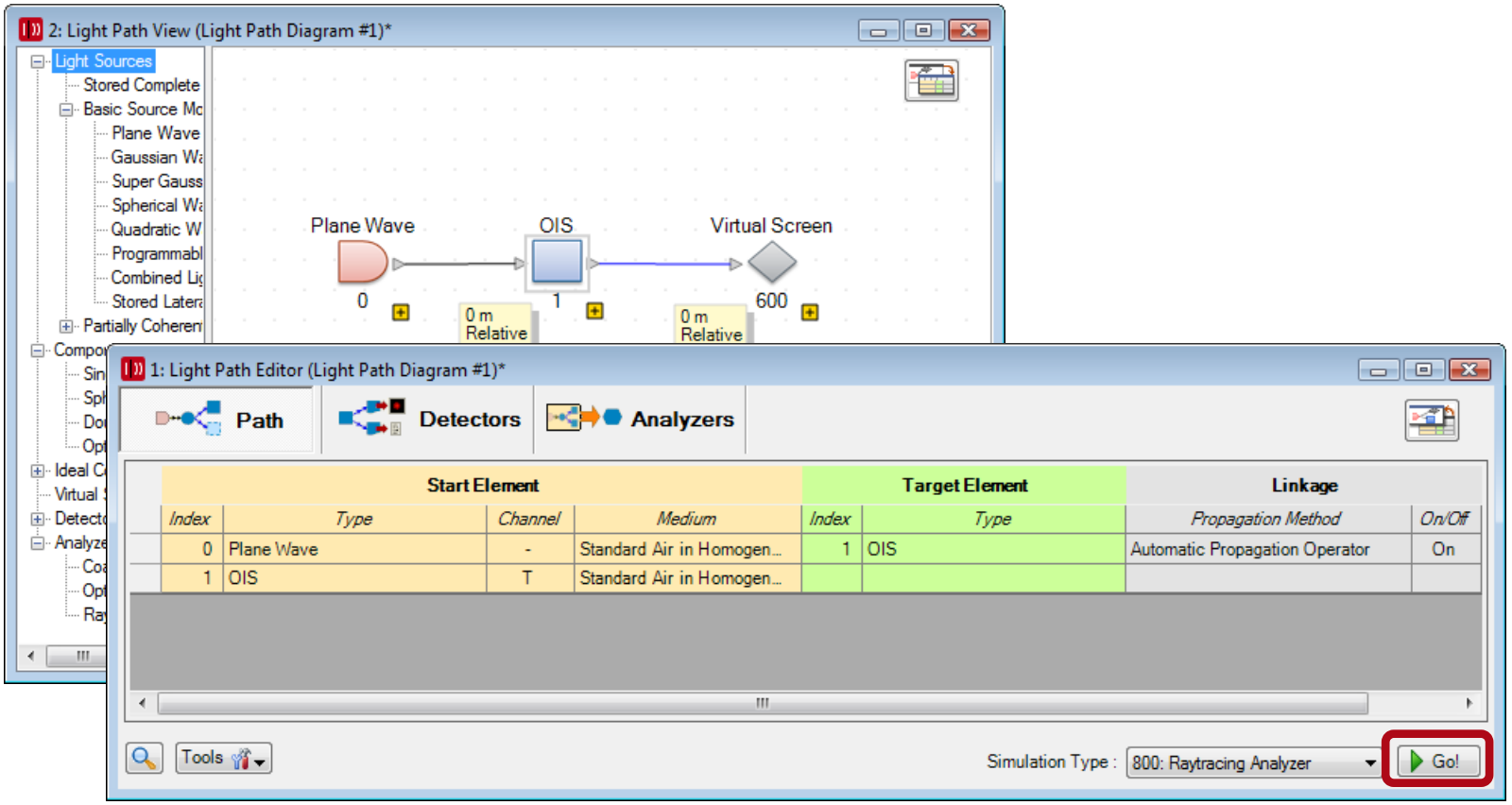
Open Edit dialog via double click on analyzer symbol:



- Choose component to analyze
- Define size of ray matrix:
  - Number of rows (x-direction)
  - Number of columns (y-direction)
- Confirm settings with *OK*

3. Start the Analyzer

Choose Simulation Type *Raytracing Analyzer* and press *Go!*

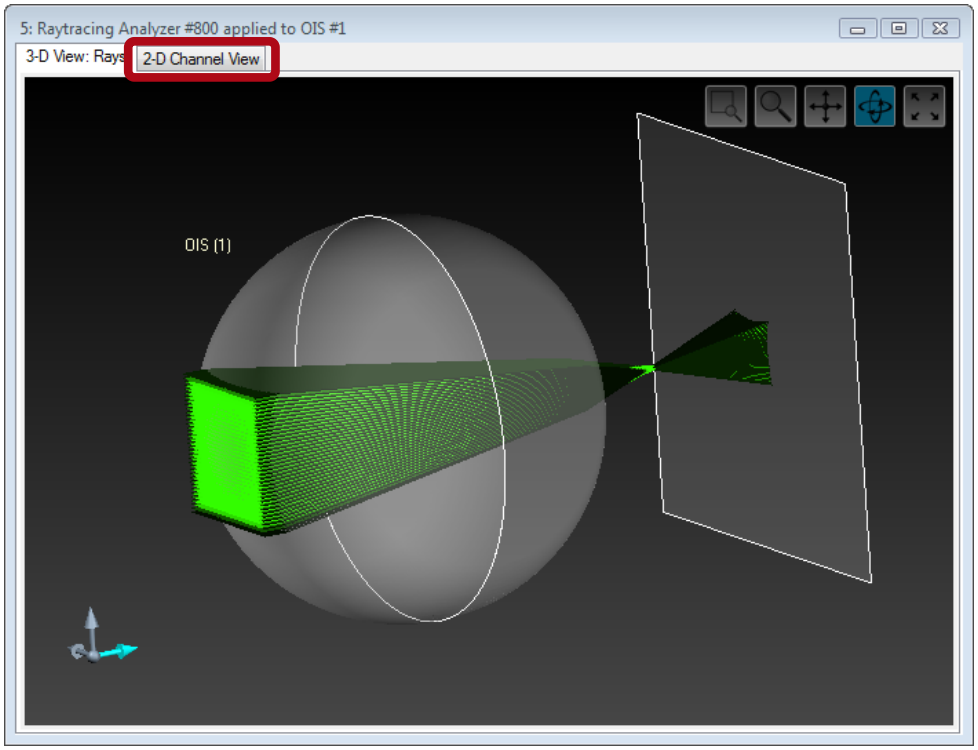


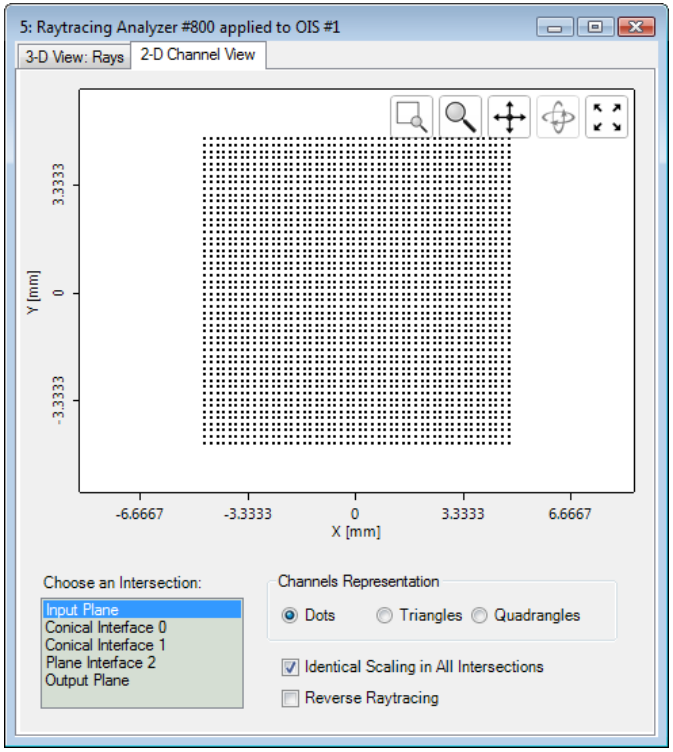
Results in

4. Raytracing Analyzer Result

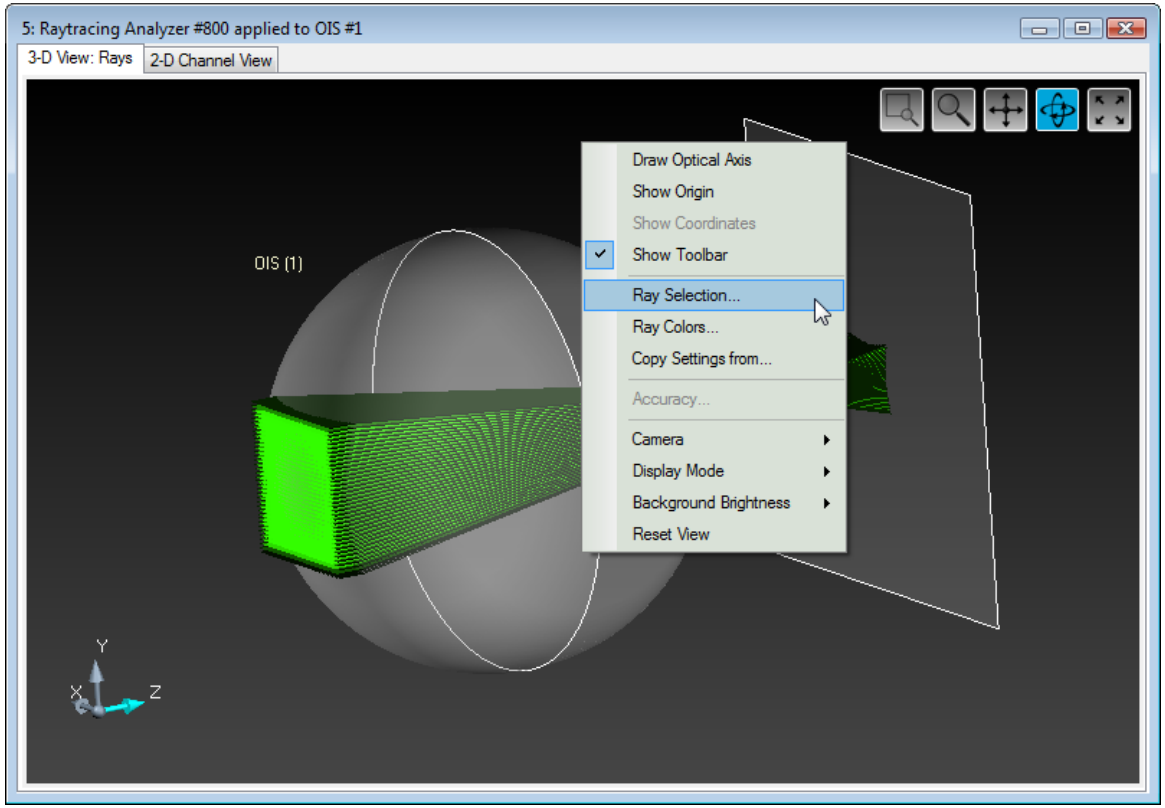
The Raytracing Analyzer's resulting document:

- Contains 2 tab pages: 3-D View of Rays and 2-D View representing the *GeOp* channels (see VirtualLab™ Manual)





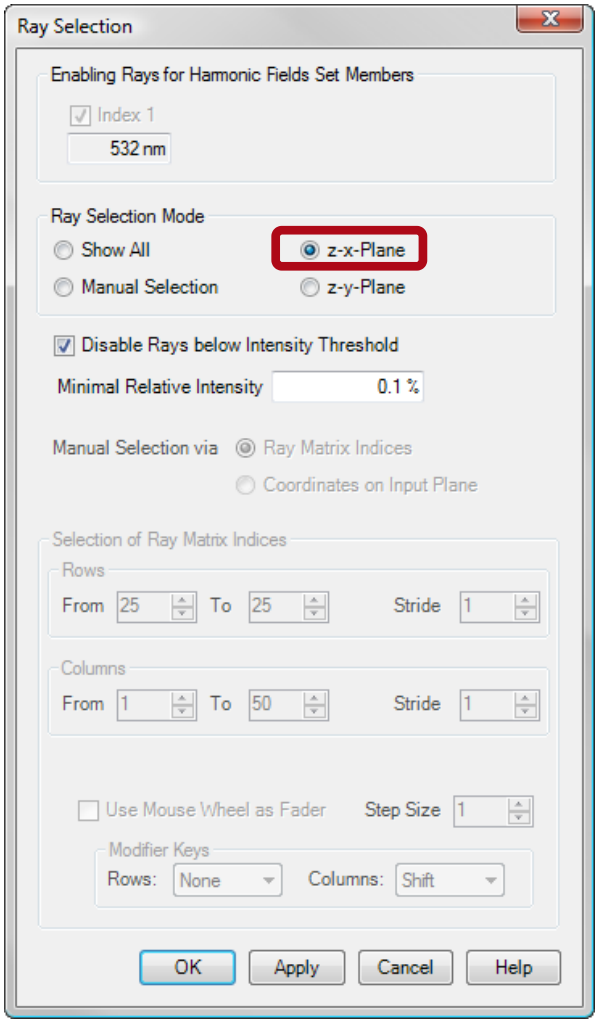
5. Ray Selection in the 3-D View



- On 3-D View tab page right-click on background to open context menu
- Click on *Ray Selection...*

Results in

5. Ray Selection in the 3-D View

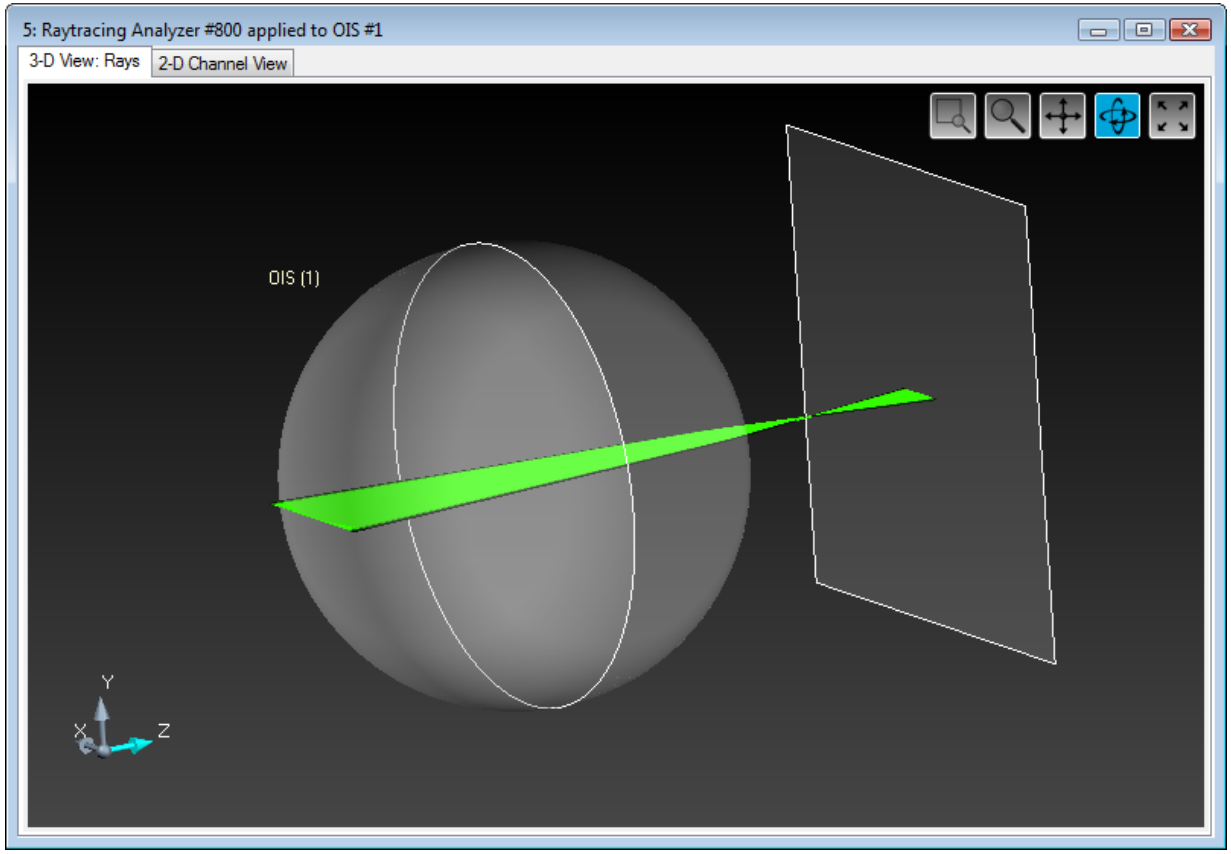


- On the Ray Selection dialog the visibility of traced rays can be specified
- Several *Ray Selection Modes* are possible
- E.g. *z-x-plane* mode*:*
  - Only rays that touch the z-x-plane on the component's input plane will be visible

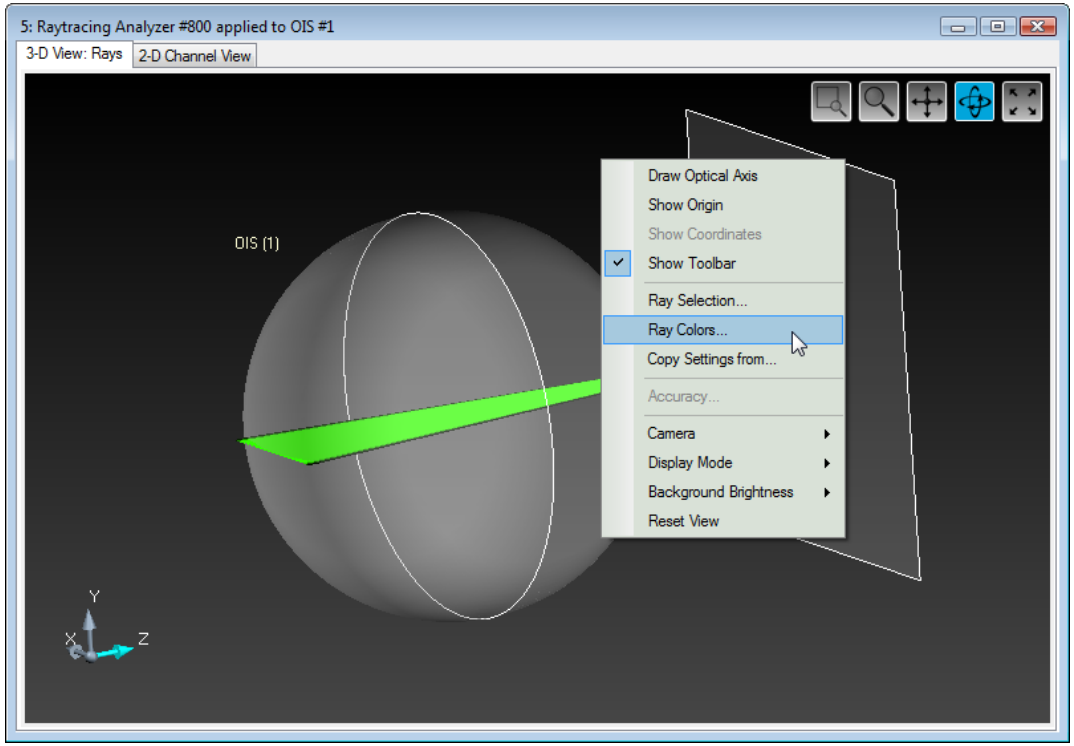
Results in

5. Ray Selection in the 3-D View

Only rays on z-x-plane are visible:



6. Ray Coloration in the 3-D View



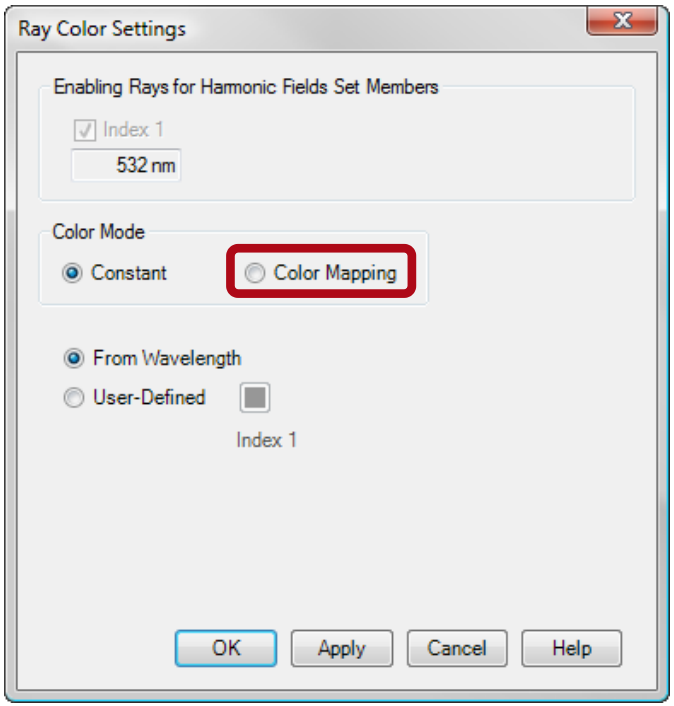
- Right click on background to open context menu
- Click on *Ray Colors...*

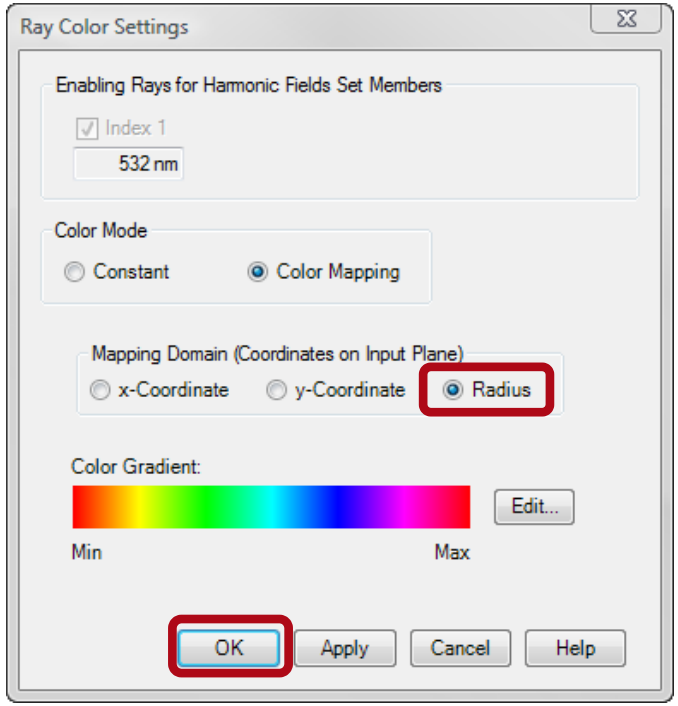
Results in

6. Ray Coloration in the 3-D View

On the *Ray Color Settings* dialog the ray coloration can be specified:

- *Constant* color mode: Either *From Wavelength* of light source or *User-Defined*
- *Color Mapping:* Map a specified domain (here: *Radius*) to color

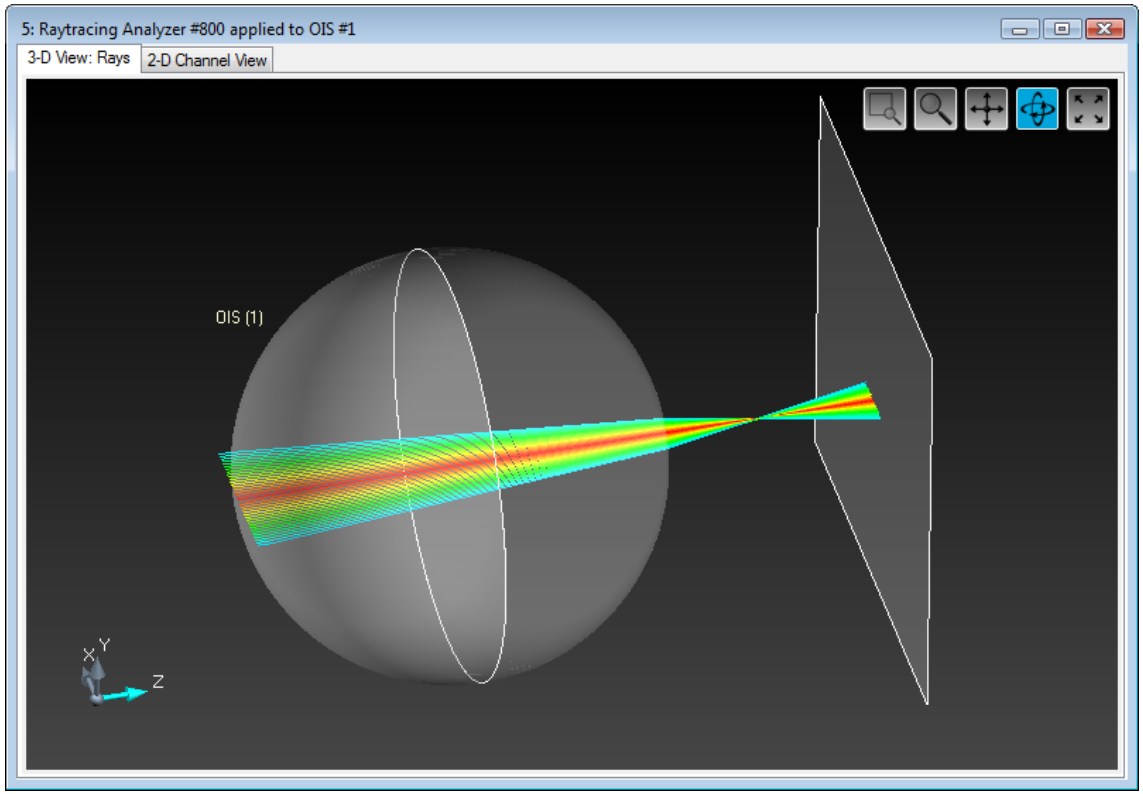




Results in

6. Ray Color Mapping

Color mapping from ray distance on analyzed component's input plane (= *Radius* on the previous dialog) to color



- Color mapping is done in the HIS color space
- The mapping's co-domain can be defined via the *Edit Color Range* dialog (click *Edit* on the previous dialog)