

UseCase.0015 (1.0)

Real Components in VirtualLab

Keywords: structure, propagation, interface, medium

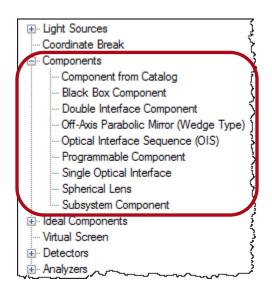
Description

- VirtualLab differentiats between idealized and real components.
- Real components have a real structure definition and the propagation through the structure can be defined.
- This use case shows how real components can be added to the light path diagram.
- It also demonstrates the edit options for real components.
- Further information on the setup of the propagation techniques to analyze the component will be discussed.

Real Components

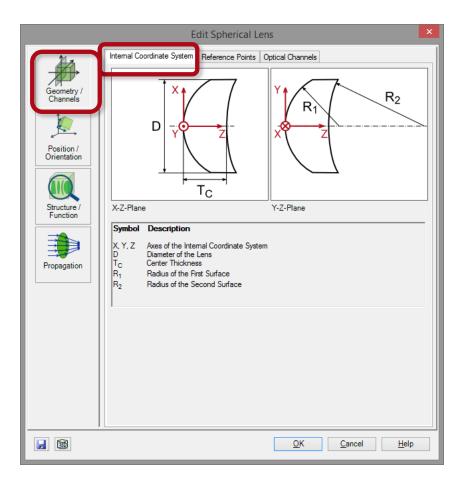
- Real components contain specifications of:
 - Component interfaces, media and coatings
 - Orientation of components
 - Relative position
 - Reference points
 - Tolerances
- Light propagation through a component structure is simulated by specific models. Available models depend on the component type.
- Real components have one input channel and may have have multiple regarded output channels.

Add Real Components to Light Path Diagram



- VirtualLab allows to add real component to the light path diagram.
- The following real component are often used within the LPD:
 - Single Interface
 - Spherical Lens
 - Optical Interface Sequence
 - Off-Axis Parabolic Mirror
 - Programmable Component
- It is also possible to access the component catalog.

Real Components – Geometry



- Within the edit dialog of each real component the user can access the geometry information.
- The user gets an overview on the position and orientation of the internal coordinate system, on available reference points and on optical channels of the component.

Real Components – Structure (Lens Component)

Edit Spherical Lens					
Geometry / Channels	Lens Specification Diameter Center Thickness First Surface Type	20 mm 4.3 mm Plano V	Second Surface Type Radius	Convex ↓ 51.99 mm	
Structure / Function	Medium of Lens Material N-BK7 in Homogeneous Medium Load ✓ Edit Coating Name No Coating Name No Coating				
	Evaluation Design Wavelength Focal Length (in Air)	532 nm 100 mm	Definition Effect	tive Focal Length ∨	
	n		ОК	Cancel Help	

- The structure of real component is edited on the Structure/Function tab of the edit dialog.
- The structure definition of each type of real component is different.
- On the left side the tab page for the structure definition of the spherical lens is shown

Reference Points & Optical Channel

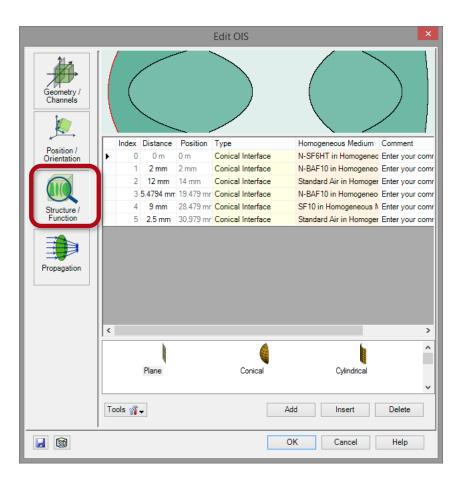
Edit Spherical Lens Edit Spherical Lens Reference Points Optical Channels Internal Coordinate System Reference Points Optical Channels emal Coordinate System P₂ P₄ P₆ Channel to Show Т ¥. Geometry / Geometry / Axis Direction and Orientation Channels Channels Default Position of Channel's Position / Position / Coordinate Orientation Orientation System Ζ P_{0,1} P₃ P₅ Structure Structure Function Function Index Description The Transmission Output Axis is identical to the axis of symmetry. The asso-ated coordinate system is not rotated to the Internal Coordinate System. Initially, its origin is I cated at the second ∃ Maximum Extension Plane #1 Front Vertex plane of maximum extension. First Principal Plane 2 Propagation Propagation Center of the Lens Second Principal Plane Back Vertex Maximum Extension Plane #2 Origin (Reference Point) Back Vertex v Homogeneous Channel Medium Standard Air in Homogeneous Medium 🚰 Load 🥒 Edit Q View 🖌 🔞 OK 🖌 🔞 Cancel Help OK Cancel Help

Lists all available Reference Points

Select channel (Input, T=Transmission, R=Reflection) whose parameters should be shown/specified

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Real Components – Structure (OIS Component)



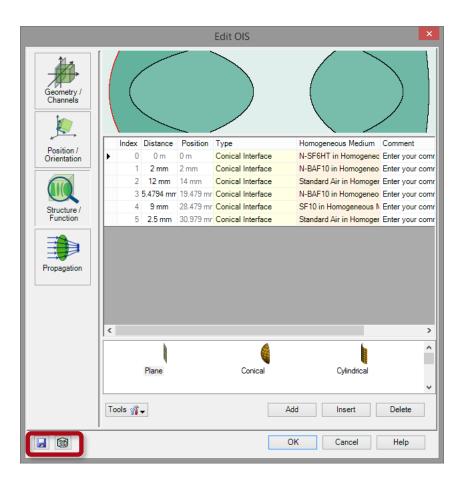
- The picture on the left side shows the structure/function tab page of the optical interface sequence (OIS) component.
- In case of an OIS a list of interfaces with associated distances, types, media and comments can be specified.

Real Components – Propagation

Edit OIS					
Prop	Propagation Methods Advanced Settings				
Geometry / Channels	mponent Propagation Geo	ometrical Optics	✓ 🖉 Edit		
	Interface	Stack	Medium		
	Conical Interface Geometrical Optics V	No Stack	N-SF6HT in Homogeneo Geometrical Optics		
Position / Orientation	Conical Interface Geometrical Optics	No Stack	N-BAF10 in Homogeneo Geometrical Optics		
	Conical Interface Geometrical Optics V	No Stack	Standard Air in Homoge Geometrical Optics		
Structure / Function	Conical Interface Geometrical Optics	No Stack	N-BAF10 in Homogeneo Geometrical Optics		
	Conical Interface Geometrical Optics	No Stack	SF10 in Homogeneous Geometrical Optics		
Propagation	Conical Interface Geometrical Optics	No Stack	Standard Air in Homoge		
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		ОК	Cancel Help		

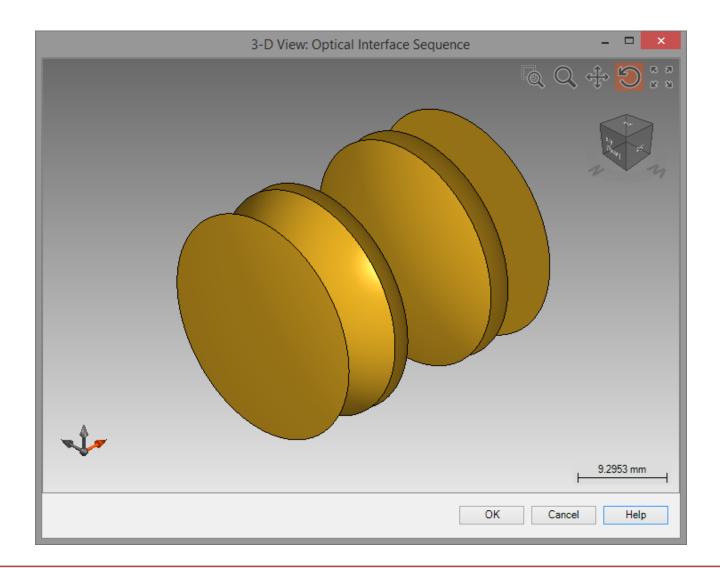
- On the page Propagation the user can select the propagation method to be used to analyze the component.
- In addition the user can define numerical and also physical parameters of the propagation operator.

Real Components – Tools



- At the left bottom of the edit dialog of a real component some tools can be accessed.
- The following tools are available for all components:
 - Save (to catalog)
 - View (show preview)

Preview of an OIS Component



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- Real components can be used to define and analyze real structures which consists of optical surfaces and optical media (homogeneous and in-homogeneous).
- The user can define which propagation technique shall be used for the analysis of the component and can also configure the numerical and physical parameters of the propagation operator.
- The preview allows a visualization of the 3D structure of the defined component.