

Coupling of Parameters in VirtualLab Fusion

Abstract



The parameter coupling feature of VirtualLab enables the coupling of each parameter of an arbitrary optical setup. Further, the values can be used to re-calculate other parameters and thus this feature allows to create very complex relations of these parameters. For instance, parameter coupling is helpful if specific parameters of the optical system are intended to have fixed relations during a variation or optimization.

Set Up Parameter Coupling

- In order to use the parameter coupling feature of VirtualLab activate the option "Use Parameter Coupling" for a given optical setup.
- Afterwards, the "*Edit Parameter Coupling*" button is available.
- By clicking the "*Edit Parameter Coupling*" button, the parameter coupling wizard appears.



www.LightTrans.com

Choose Involved Parameters

- By clicking "*Next*", a table is shown, which contains all parameters of the current optical setup.
- Please select all parameters for coupling and necessary calculation. For instance, the parameters "*ZExtension*" and "*Distance*" of a grating interfaces are chosen.

dit Par	rameter Coupling				
aram e Setup t	eter Specification the parameter(s) to be	used as input (inc	lependent variable) and output (dependent variable) of the	e coupling snippet.	
Filter by	У		×	Show Only	Used Parameters
2 *	Object	Category	Parameter	Use in Snippet	Short Name
	General Grating 2D	Stack #2	Medium #1 (Coated Slanted Grating Medium) ZExt		ZExtension
	#1 ~	(Stack)	Interface #2 (Plane Interface) Distance		Distance

The Source Code Editor

- After choosing the parameters, the snippet which controls the coupling has to be set.
- By clicking "*Edit*" the source code editor opens.



www.LightTrans.com

The Source Code Editor

- The source code tab contains three areas:
 - the source code (center area) (1)
 - global variables resp. parameters (upper right area) (2)
 - chosen system parameters (lower right) (3)



General Example of Parameter Coupling

- In general, the chosen parameters have to be read from the dictionary and saved to a variable (line 4).
- Afterwards, the value can be used as output for another parameter and further calculated, e.g. doubled (line 7).



Definition of Global Parameters

- In this particular example, it is helpful to define a new global variable, which later appears on the parameter coupling window.
- This can be done in the "Global Parameters" tab.
- The variable can exhibit different types and physical quantities.

Source Code Ex				— 🗆 X
Source Code Glober anameters Snippet	Help Advanced Settings			
General Parameters				<u>^</u>
Variable Name	Туре	Description		
GratingHeight	Double Value E	dit 📄 Value: 600 i	nm (Allowed range: 0 mm 1 m)	
Global Materials Variable Name Material	Edit General Paramet Name Physical Quantity Value Minimum Value Maximum Value	Oouble Value	Cancel Help	Add Remove Add
Global Media				
Variable Name Medium				Add
				Remove
Check Consistency Validity	/: 🗚 🚺			OK Cancel Help

Particular Example of Parameter Coupling

- In this example, the global variable is used to return its value to both chosen parameters of the system.
- Thus, no parameter has to be read from the dictionary or re-calculated.



Particular Example of Parameter Coupling

• After closing the source code editor, the defined global variable "GratingHeight" appears.

Edit Parameter Coupling				×
Snippet Specification Define the snippet which does the actual parameter coupling				
/ Edit	Validity: 🕑			
GratingHeight				600 nm
Help Validity: 🚹		< Back	Next >	Finish

Final Check of the Set up Parameter Coupling

• On the last page of the wizard, the returned parameters and values can be checked.

Edit Parameter Coupling	×
Summary Overview of all coupled parameters you have added to the output dictionary of your snippet and their values calculated according to said snippet using the current values of the independent parameters.	
Coupled Parameter Value ZExtension 600 nm Distance 600 nm	
Help Validity: 🕑 < Back Next > Finish	

Document Information

title	Coupling of Parameters in VirtualLab Fusion
version	1.0
VL version used for simulations	7.3.0.50
category	Feature Use Case