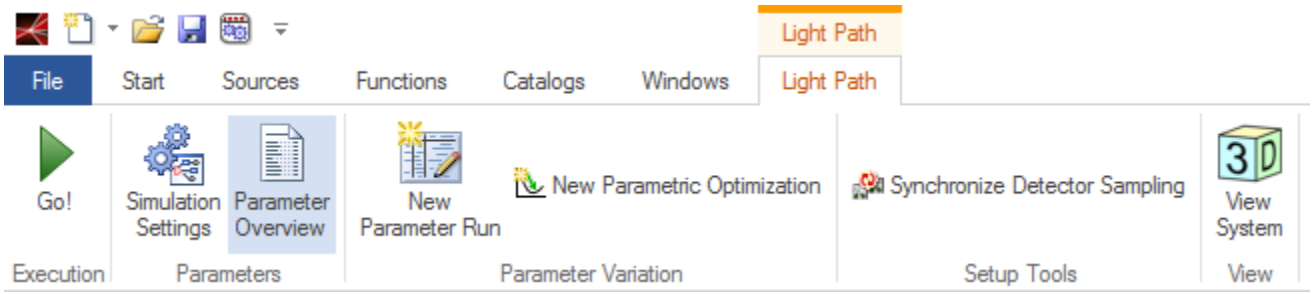
UseCase.0029 (1.0)

Parameter Overview

Keywords: Parameter Overview, grating equation, find, set, configure, quick, fast, system, comparison, check

Introduction

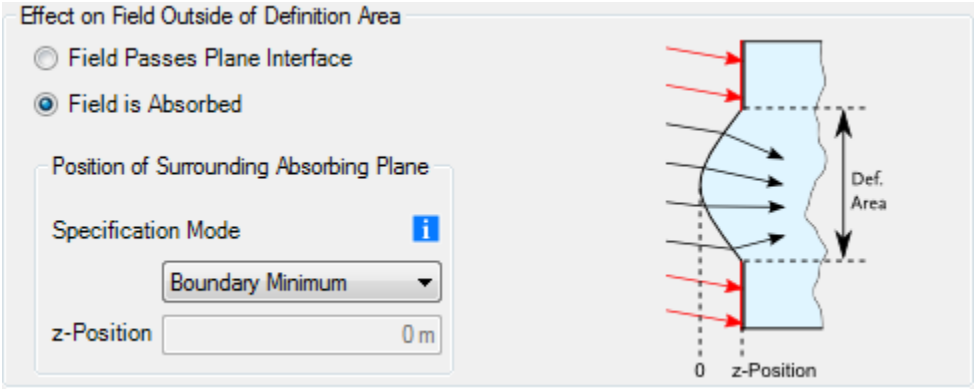
- This use case introduces the Parameter Overview dialog which allows you to set all numerical parameters within a Light Path Diagram at once.



Rationale for the Parameter Overview

The VirtualLab user interface was designed with the following premises:

- **Modular:** For example you can edit the interfaces of a Double Interface Component and of a stack with the very same dialogs.
- **Explanatory:** Additional information and images explain complex issues.



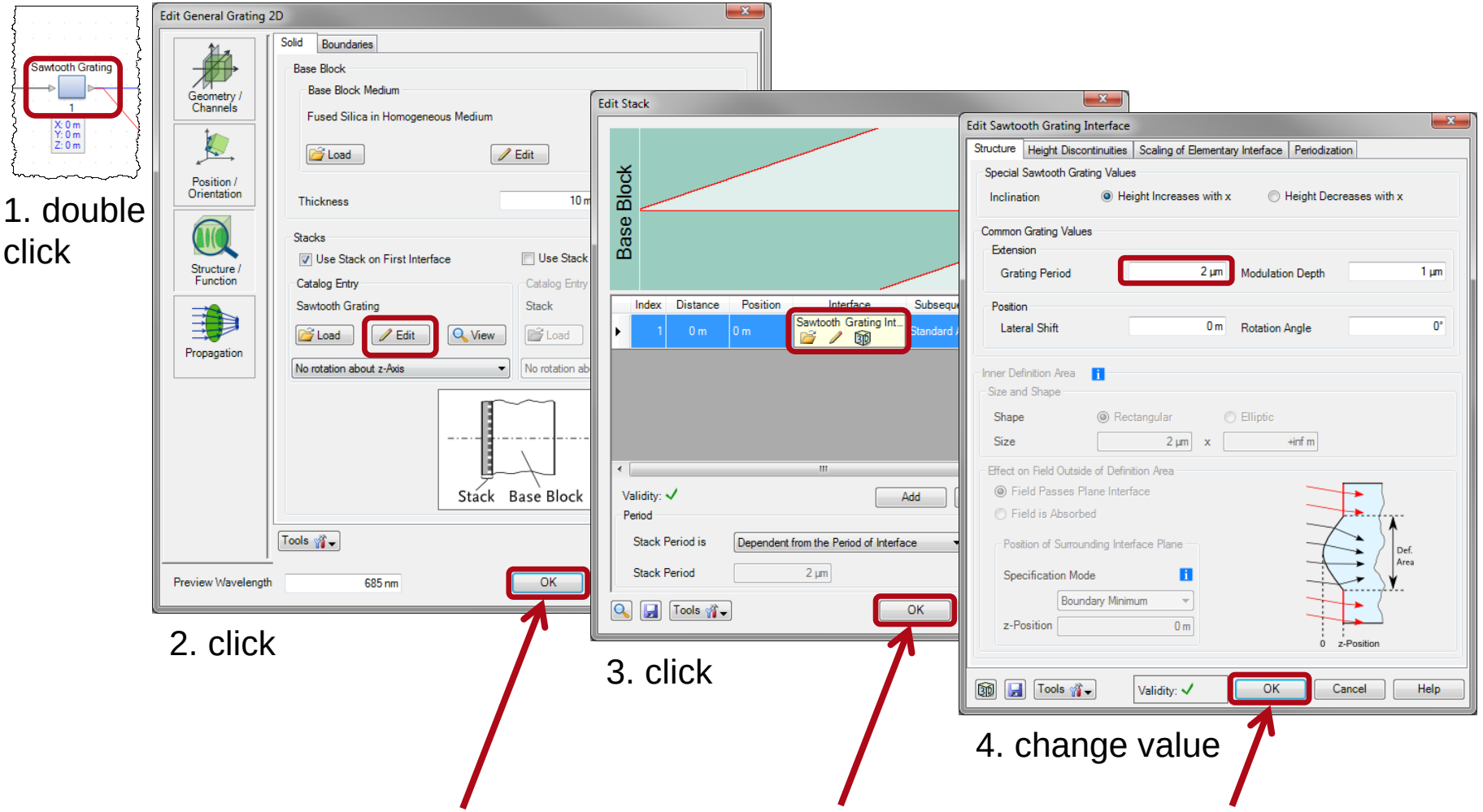
- **Structured:** Tab pages and boxes group related controls.

Rationale for the Parameter Overview

- However, this leads to many user interactions required to change a single parameter.

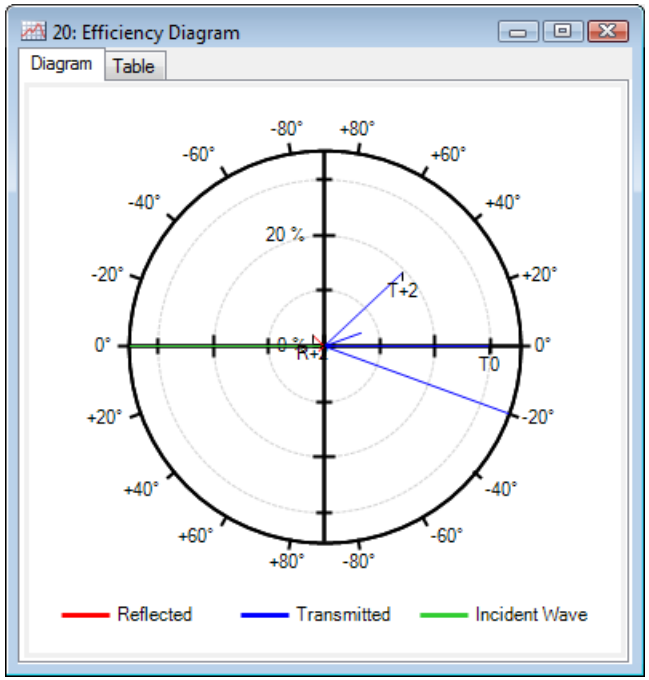
- To change the period of a sawtooth grating for example, you need to do the following.

Rationale for the Parameter Overview



Usage Example

- For a sawtooth grating system, both the wavelength and the period shall be doubled using Light Path > Parameter Overview.
- Original result:

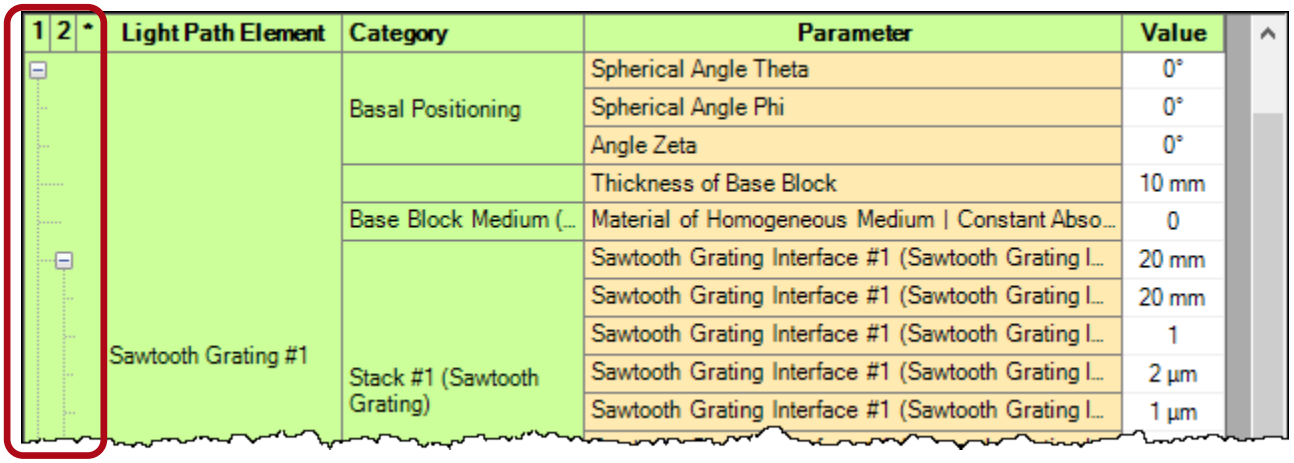


Parameter Overview Dialog

- The Parameter Overview dialog mainly consists of a table containing all numerical parameters of a Light Path Diagram.
- You can set a new value for each parameter directly in the table.

Hierarchy in the Dialog

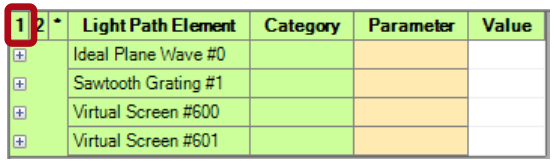
- The parameters are presented in a hierarchy. The top level lists the distinct *Light Path Elements*, the second level lists "*Categories*" e. g. the interfaces, media, and stacks in each Light Path Element, and the third level lists the actual *Parameters*.
- The hierarchy levels can be collapsed or expanded by clicking on the +/- symbols or the *1*, *2*, * in the first column.



1 2 *	Light Path Element	Category	Parameter	Value
	Sawtooth Grating #1	Basal Positioning	Spherical Angle Theta	0°
			Spherical Angle Phi	0°
			Angle Zeta	0°
			Thickness of Base Block	10 mm
		Base Block Medium (...	Material of Homogeneous Medium | Constant Abso...	0
		Stack #1 (Sawtooth Grating)	Sawtooth Grating Interface #1 (Sawtooth Grating I...	20 mm
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	20 mm
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	1
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	2 µm
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	1 µm

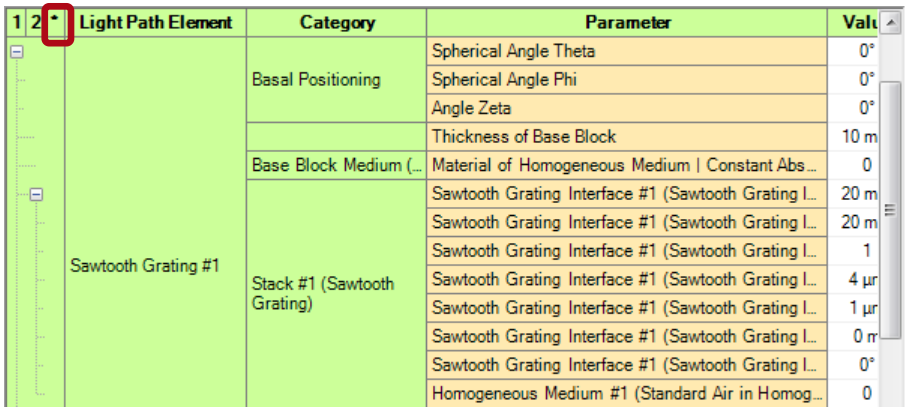
Hierarchy in the Dialog

- *1* : The table is completely collapsed.
- *2* : The Light Path Elements are expanded, all Categories are collapsed.
- *** : Everything is expanded.



1 2 *	Light Path Element	Category	Parameter	Value
⊞	Ideal Plane Wave #0			
⊞	Sawtooth Grating #1			
⊞	Virtual Screen #600			
⊞	Virtual Screen #601			

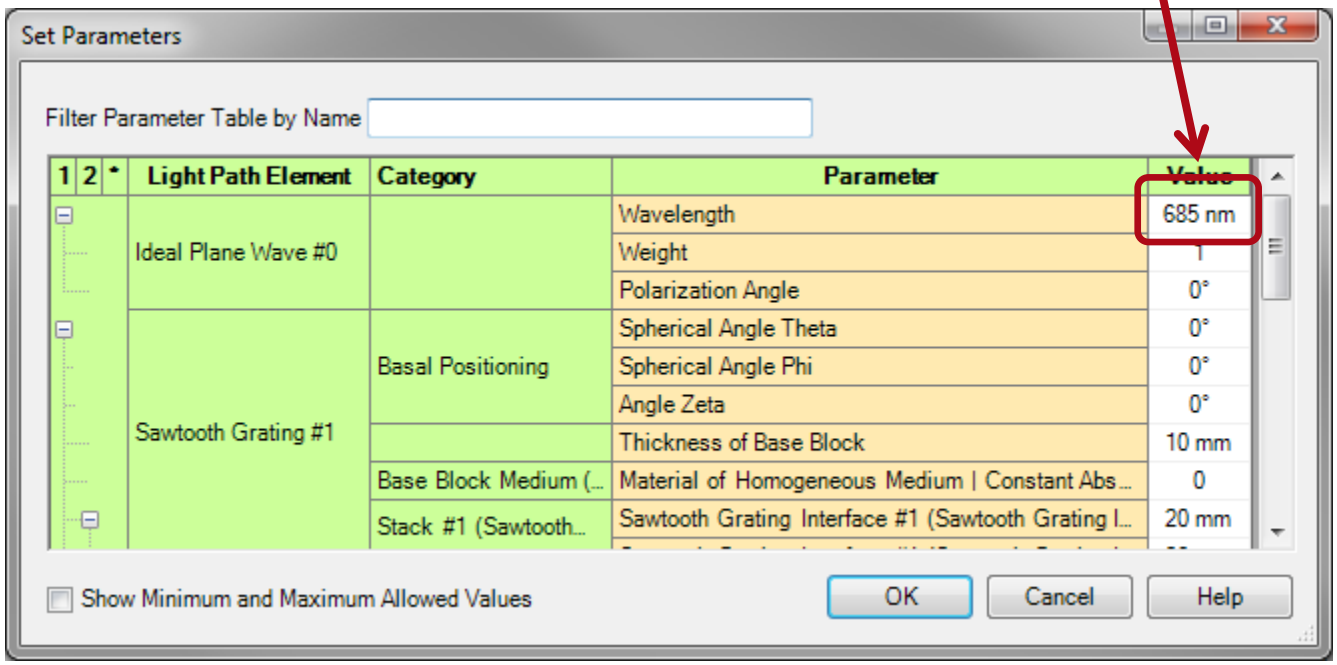
1 2 *	Light Path Element	Category	Parameter	Valu
⊟	Sawtooth Grating #1	Basal Positioning	Spherical Angle Theta	0°
			Spherical Angle Phi	0°
			Angle Zeta	0°
			Thickness of Base Block	10 m
		Base Block Medium (Fused Silica...	Material of Homogeneous Medium | C...	0
⊞		Stack #1 (Sawtooth Grating)		
			Accuracy Factor for FMM (Layers)	1
			Accuracy Factor for FMM (Transition...	1
			Number of Evanescent Orders	50



1 2 *	Light Path Element	Category	Parameter	Valu
⊟	Sawtooth Grating #1	Basal Positioning	Spherical Angle Theta	0°
			Spherical Angle Phi	0°
			Angle Zeta	0°
			Thickness of Base Block	10 m
		Base Block Medium (...	Material of Homogeneous Medium | Constant Abs...	0
⊟		Stack #1 (Sawtooth Grating)	Sawtooth Grating Interface #1 (Sawtooth Grating I...	20 m
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	20 m
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	1
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	4 µr
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	1 µr
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	0 m
			Sawtooth Grating Interface #1 (Sawtooth Grating I...	0°
			Homogeneous Medium #1 (Standard Air in Homog...	0

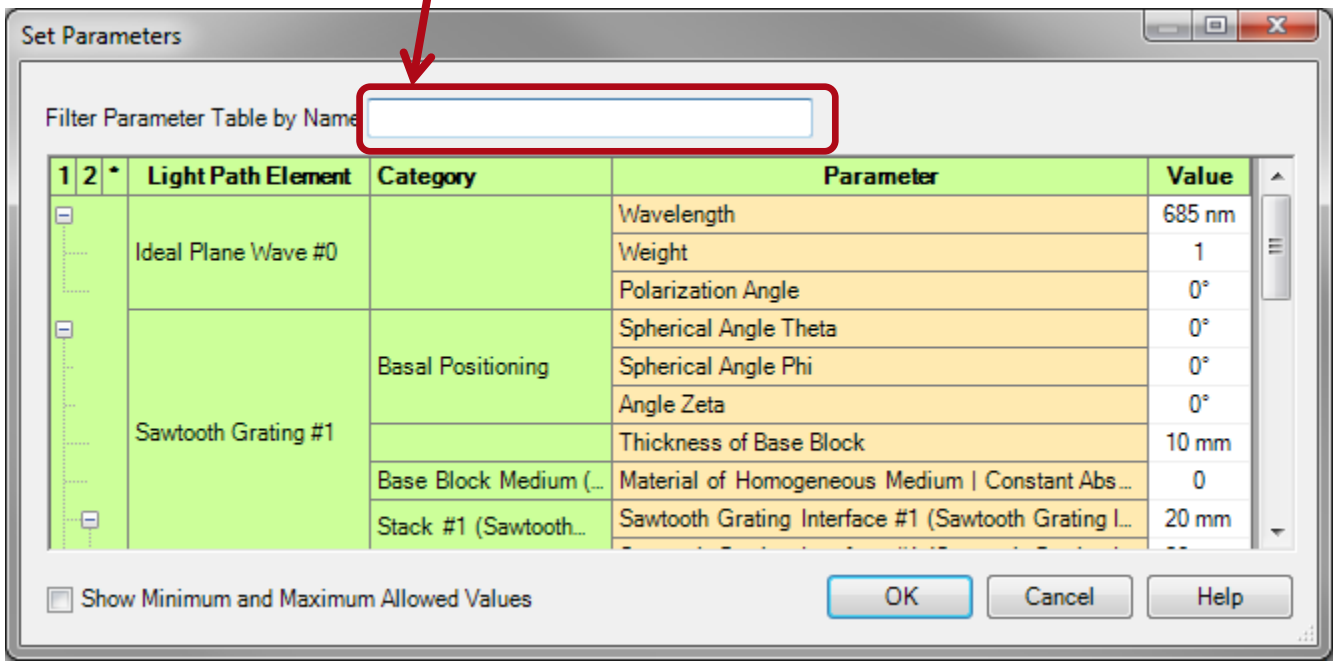
Double the Wavelength

Change to
“1370 nm”



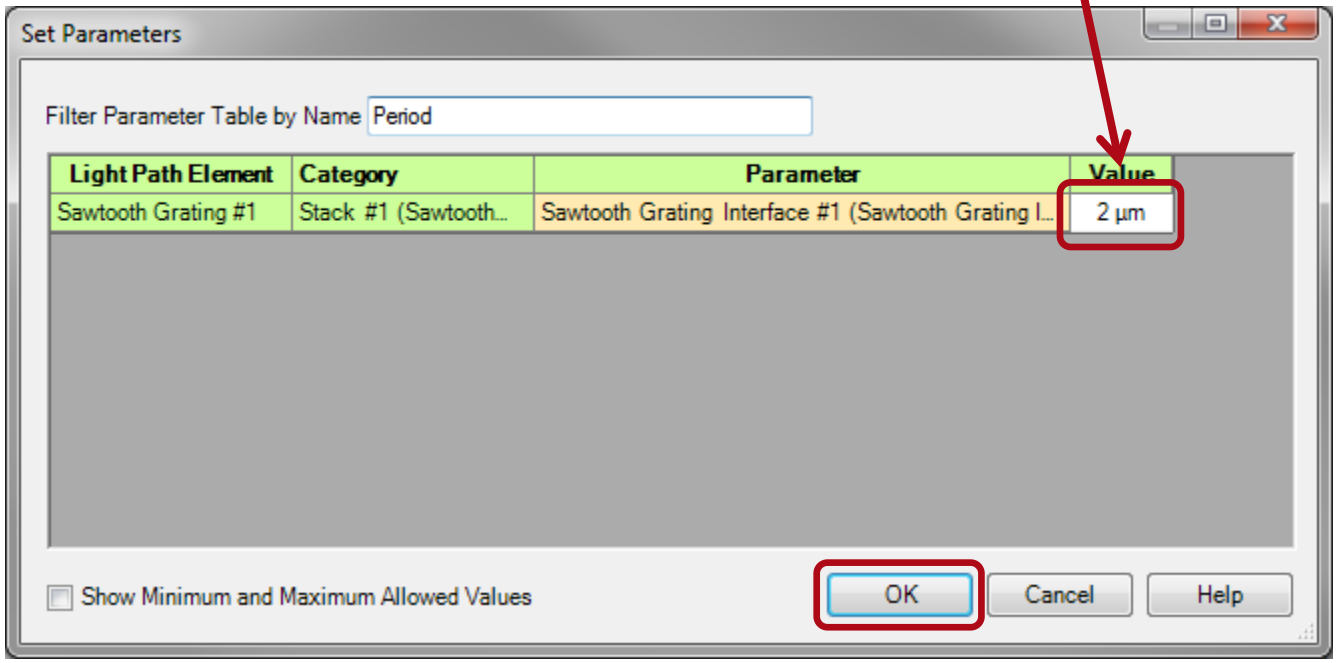
Filter for Period

Enter “Period” in the Search field for quick finding.



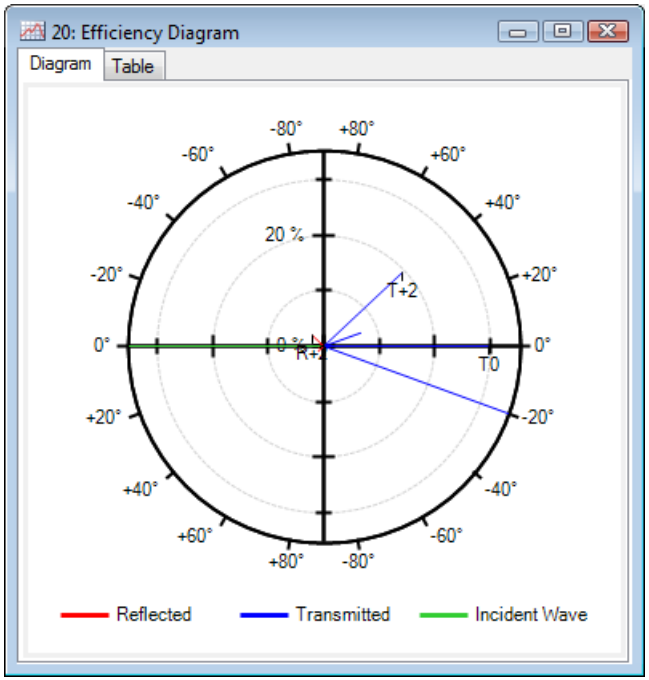
Double the Period

Change to
“4 µm”

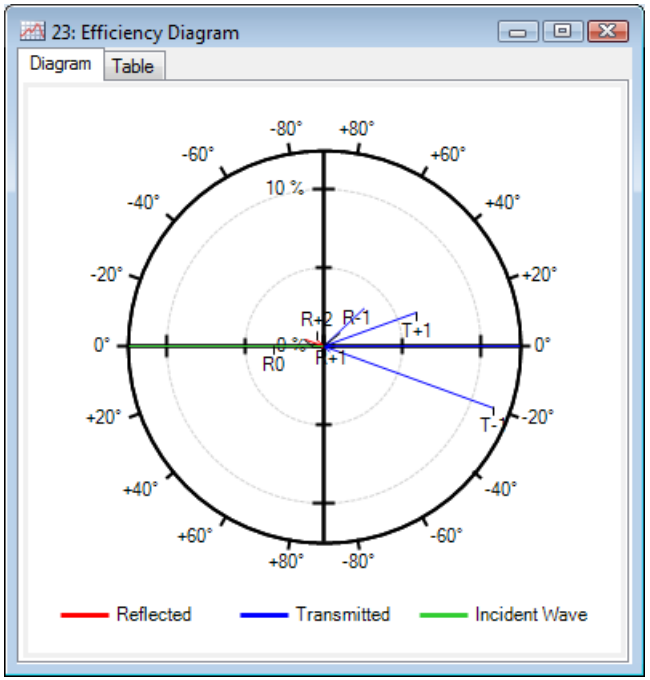


Result Comparison

Result original simulation



Result with doubled wavelength and period



The diffraction angles remain unchanged, as expected from the grating equation. But of course the efficiencies differ.

Summary

- The Parameter Overview document enables the user to check and change any and arbitrary many numerical parameters of an optical system very fast and efficiently.

- By entering search keywords for parameters that are of interest, VirtualLab filters all relevant parameters.

- The Parameter Overview document can be used for an easy comparison of settings of different Light Path Diagram documents.