

Export of Results of a Parameter Run

Abstract



Welcome to the Parameter Run Document.

Herewith you can vary parameters of an Optical Setup and analyze the effects of the variation with various detectors. The results are plotted in a table from which harmonic fields sets, diagrams or animations can be derived. For further help click F1.



The variation of parameters of an optical system is required for the detailed analysis of its functionality and capabilities. For this purpose, the parameter run of VirtualLab Fusion can be applied, which provides versatile options of variation strategies. After finishing the variation, the results are provided in the parameter run document. In this use case the export of the yielded results of the parameter run is explained.

Overview

- Results of a parameter run are provided in a table.
- The results of this variation can be of different type, e.g.:
 - 2D field or intensity distribution
 - numerical values of physical quantities
- In case of numerical results, the values can be marked (either single or row/column wise) and copied by right clicking or with the help of the short cut Ctrl + C.

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Results									
Start the parameter run and an	nalyze its results								
Go!									
Use Cached Results for No	ext Run								
					Iteration Ster				_
Detector	Subdetector	Combined Output	1	2	3	4	5	6	
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Camera Detector #611 afte		Animation 🗸 🥖	Chromatic Fie	Copy Selecti	on to Clipboard	Ctrl+C	c Fields Set	Chromatic Fields Set	Ch
Wavefront Error #612 after	RMS [λ] of Wavefront Error	Data Array	18.03	Combined O	utout from Color	tion	.484816011	0.9858561291	
				Combined U	utput from selec	uon			
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Wavefront Error #612 after.	RMS [],] of Wavefront Error	Data Array	18.03	Combined O	utput from Selec	tion	- 1843 561 - 484816011 - 484816011	Next>	Shor

Export of 2D Data

- In case of 2-dimensional field data the results can be saved only individually, by default.
- Due to the flexible programming capabilities of VirtualLab Fusion, a small module can be used in order to export the data from the parameter run into a desired file format, e.g. text or bitmap file.
- By applying the programmed module also combined outputs can be realized, e.g. putting numerical results into the header of the 2D field data (pls. see example).

Export Module

- Inside the module, some settings have to adapted in order to customize code with regards to the particular parameter run.
- On the next slides, this process is explained based on an example.

📔 81: C:	Users\\ExportPR.cs*		- • ×		
Source Cr	de Advanced Settings				
1 F	Jusing System;				
2	using System.Collections.Generic;				
3	using System.Drawing;				
4	using System.IO;				
5					
6	using VirtualLab.Programming;				
7	using VirtualLabAPI.Core.BasicFunctions;				
8	using VirtualLabAPI.Core.Common;				
9	using VirtualLabAPI.Core.DataVisualization;				
10	using VirtualLabAPI.Core.FieldRepresentations;				
11	using VirtualLabAPI.Core.Functions;				
12	using VirtualLabAPI.Core.GeometryDescription;				
13	using VirtualLabAPI.Core.LightPath;				
14	using VirtualLabAPI.Core.Materials;				
15	using VirtualLabAPI.Core.Modules;				
16	using VirtualLabAPI.Core.Numerics;				
17	using VirtualLabAPI.Core.OpticalSystems;				
18	using VirtualLabAPI.Core.Propagation;				
19	using VirtualLabAPI.Core.ParameterRuns;				
20	using VirtualLabAPI.Core.ExportImport;		-		
			•		
<u> </u>					
Error Desr	ription	Line			
Module st	arted]		
Thread fir	ished normally				
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Example Parameter Run

- In the sample system, the curvature of one of the lens surfaces of a collimation objective was varied.
- The resulting intensity distribution and error of the wavefront were calculated and are intended to be output.
- For this output, e.g. the field data is output to bitmap and text and the result of the wavefront error is added to the header of the text file.

1 85: C:\Users\\Export.run									×
Results									
Start the parameter run and a	nalyze its results								
Go!									
Use Cached Results for N	ext Run								
					Itera	ation Step			
Detector	Subdetector	Combined Output	1	2	3	4	5	6	
Varied Parameters	Radius of Curvature (Colli	Data Array	-5.8 mm	-6 mm	-6.2 mm	-6.4 mm	-6.6 mm	-6.8 mm	1
Camera Detector #611 afte		Animation 🗸 🥖	Chromatic Fields Set	Ch					
Wavefront Error #612 after	RMS [λ] of Wavefront Error	Data Array	18.03099836	13.57037385	10.61414052	7.256258145	3.484816011	0.9858561291	
<									>
Create Output from Selec	tion								
							< Back	Next > Show	N 7

Adaption of the Module

- First, the indices of the desired detectors have to be entered (line 25 and 26).
- In case of a detector, which provides one or more numerical values, the name of the desired value ("sub detector") has to be specified (line 27).

81: C:\Users\\ExportPR.cs		
Source Code Advanced Settings		
21		ĩ
22 namespace OwnCode {	^	
23 public class VLModule : IVLModule {		
24 a //enter the indices of the desired detectors:		
25 int indexCameraDetector = 611;		
26 int indexValueDetector = 612;		
27 string subdetectorValue = "RMS [λ] of Wavefront Error";		
28		
29 //enter the desired directory and name of file for export:		
30 string directory = @"C:\Temp\Results\";		
31 string filename = "file_";		
32		
33 P public void Run() {		
34 Int dummy;		
35 //get parameter run		
36 ParameterRun priotxport = Globals.ActiveDocumentHistory.BrowseLastDocuments(DocumentFilter.ParameterRun	۱,	
37 Out alumy,		
38 Select PR TOP Export,		
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Adaption of the Module

- Further, a directory and a basic file name have to be entered (line 30).
- For the final filename, the number of the particular step of the parameter run is added automatically.

81: C:\Users\...\ExportPR.cs Source Code Advanced Settings 21 22
□ namespace OwnCode { 23 public class VLModule : IVLModule { 24 //enter the indices of the desired detectors: 25 int indexCameraDetector = 611; 26 int indexValueDetector = 612; string subdetectorValue = "RMS [λ] of Wavefront Error"; 27 28 29 //enter the desired directory and name of file for export: 30 string directory = @"C:\Temp\Results\"; 31 string filename = "file_"; 32 33 public void Run() { 34 int dummy; 35 //get parameter run 36 ParameterRun prToExport = Globals.ActiveDocumentHistory.BrowseLastDocuments(DocumentFilter.ParameterRun, 37 out dummy, 38 "Select PR for Export", 39 true) as ParameterRun; 40 4 11 Error Description Line Module started Thread finished normally Ln 21 Ch 1

Run the Module

- After adaption of the module, it can be executed.
- In the appearing dialog, please choose the desired parameter run.

• Now, the desired results are exported to the files.

Select PR for Export	×
85: C:\Users\\Export.run	tical Setup Editor (Analysis of (
04. Falaneter harmon oz. op	
<	>
	Ok Cancel

Messages		
[04/18/2018 13:14:5	3] Compile	successful
04/18/2018 13:14:5	3] Module :	started
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0001.bmp was successful
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0001.txt was successful.
[04/18/2018 13:14:5	4] Export to	C:\Temp\Results\file_0002.bmp was successful
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0002.txt was successful.
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0003.bmp was successful
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0003.txt was successful.
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0004.bmp was successful
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0004.txt was successful.
[04/18/2018 13:14:5	[4] Export to	C:\Temp\Results\file_0005.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0005.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0006.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0006.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0007.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0007.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0008.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0008.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0009.bmp was successful
[04/18/2018 13:14:5	5] Export to	C:\Temp\Results\file_0009.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0010.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0010.txt was successful.
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0011.bmp was successful
[04/18/2018 13:14:5	[5] Export to	C:\Temp\Results\file_0011.txt was successful.
[04/18/2018 13:14:5	5] Thread f	inished normally
Detector Results	Messages	

Exported Results

- The files are now located inside the specified folder.
- The data can now be further used as desired.





Datei Bearbeiten Format Ansicht ?	
# Origin: Simulation for Radius of Curvature (Collimation Lens #4 Interface #1 (Conical Interface)) of -7.8 #	nm 🗠
# RMS [λ] of Wavefront Error: 12.09595973	
# Precision: Double Precision	- 17
# Number of Data Points: (123; 213)	
# Data Meaning: Summed Data	
<pre># Data Property: (Electric Field Strength)² [(V/m)²]</pre>	
<pre># x-Coordinates: Property: Length [mm] Coordinate of First Data Point: -0.0034715447154471547</pre>	
<pre># y-Coordinates: Property: Length [mm] Coordinate of First Data Point: -0.0034835680751173705</pre>	
0 0 0 0 0 0 0 0 0 0 0 0 0	6
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0 0 0 0 0 0 0 0 0 0 0 0	e
0 0 0 0 0 0 0 0 0 0 0 0	e
0 0 0 0 0 0 0 0 0 0 0 0	e
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Customization of the Module

- All parts of the module are fully customizable.
- This means, for instance the number and format of the outputs can be changed regarding the specific application.
- In addition, also manipulations and calculations can be done before the data is output.

Document Information

title	Export of Results of a Parameter Run
version	1.0
VL version used for simulations	7.3.0.50
category	Feature Use Case