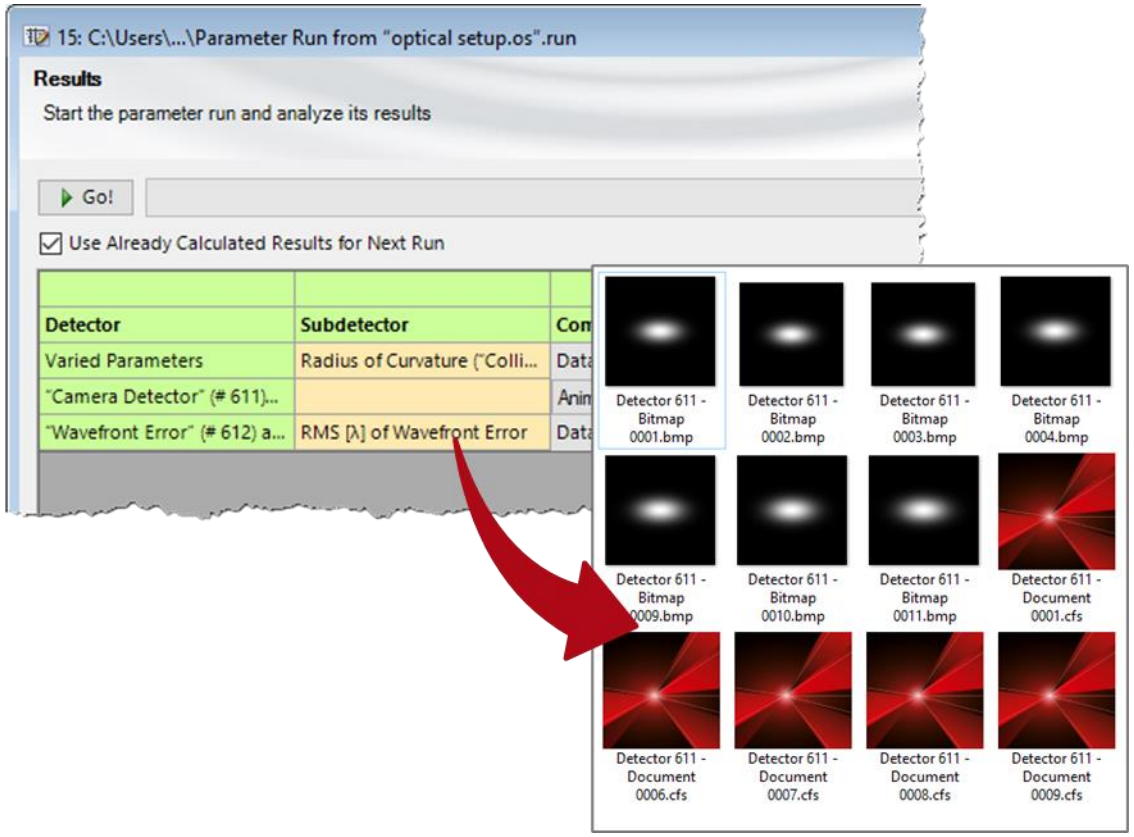
Export of Results of a Parameter Run

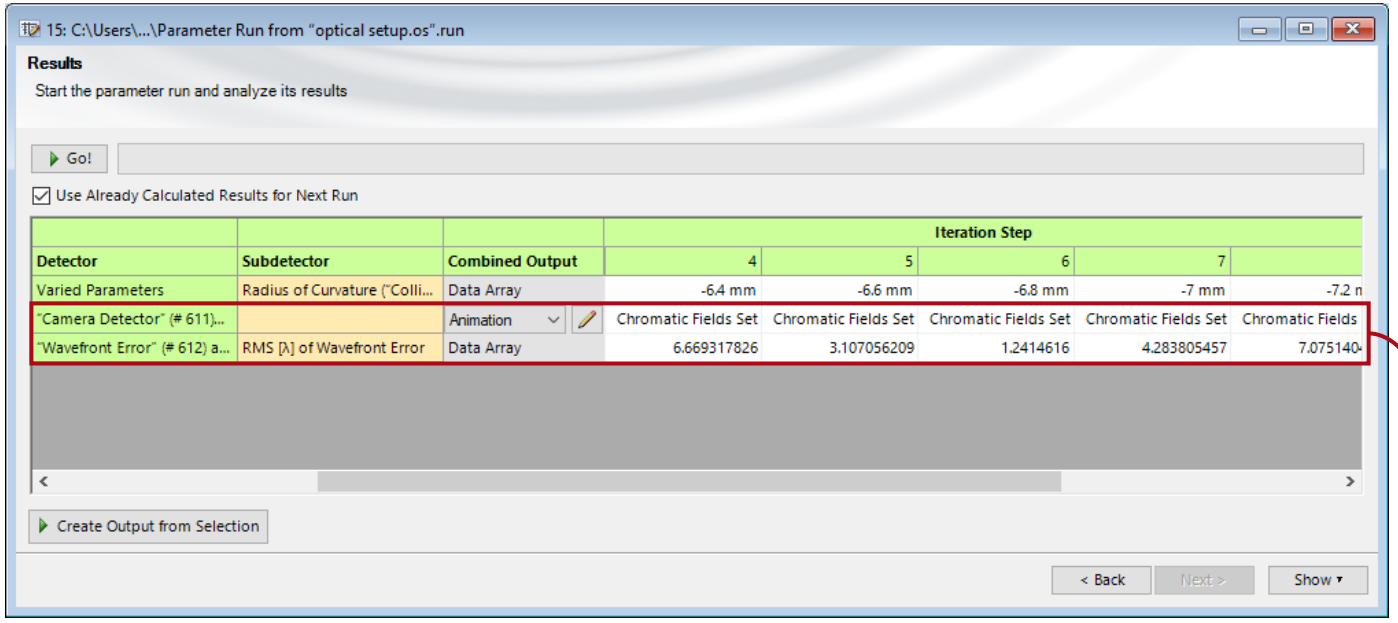
Abstract



Being able to vary the 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, which provides versatile options and different variation strategies, can be applied. The results of the different iterations are provided, in a convenient and compact way, all together in the Parameter Run document. In this use case we present a possible workflow to export the results of the Parameter Run.

This Use Case Shows…

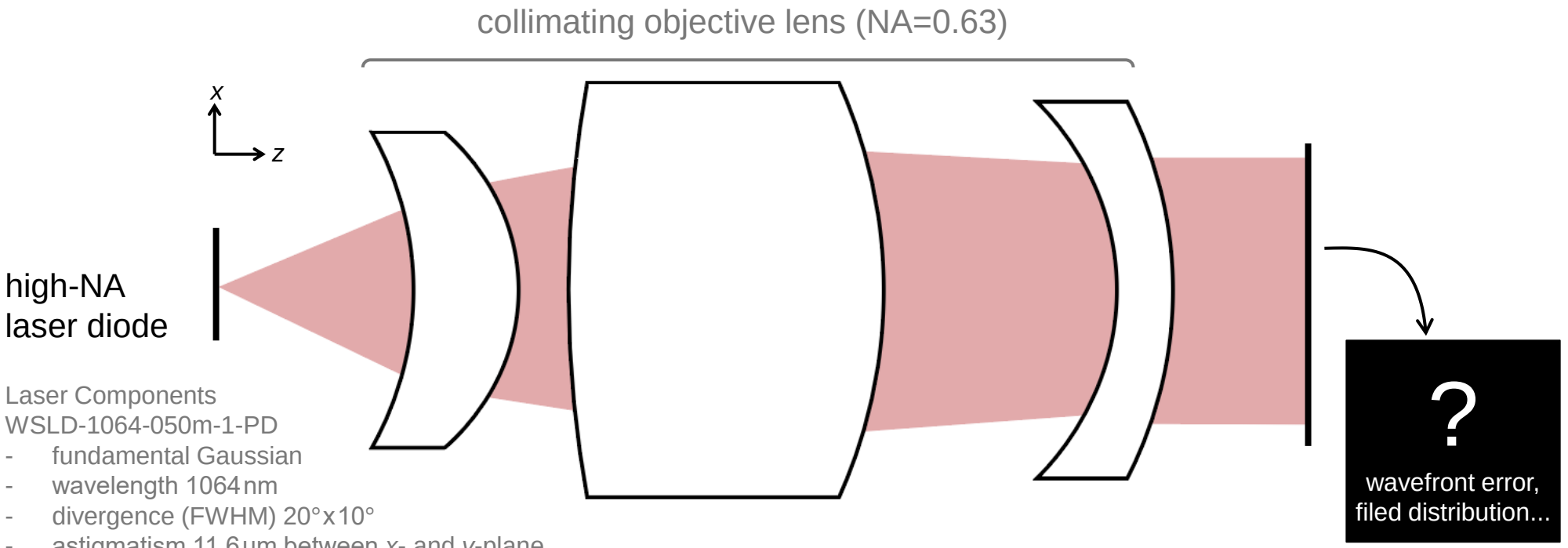
… how to use a C# module to export results from a *Parameter Run* document to a specific location on the hard disk.



The results of a *Parameter Run* are provided in a table. They can be of different types, e.g.:

- 2D field or energy density distribution
- numerical values of physical quantities

Example: Collimation of Astigmatic Diode Laser Beam

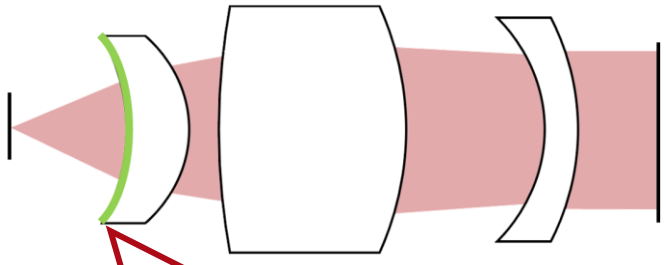


What is the wavefront error and field distribution of the collimated beam on the detector plane with varying surface parameter?

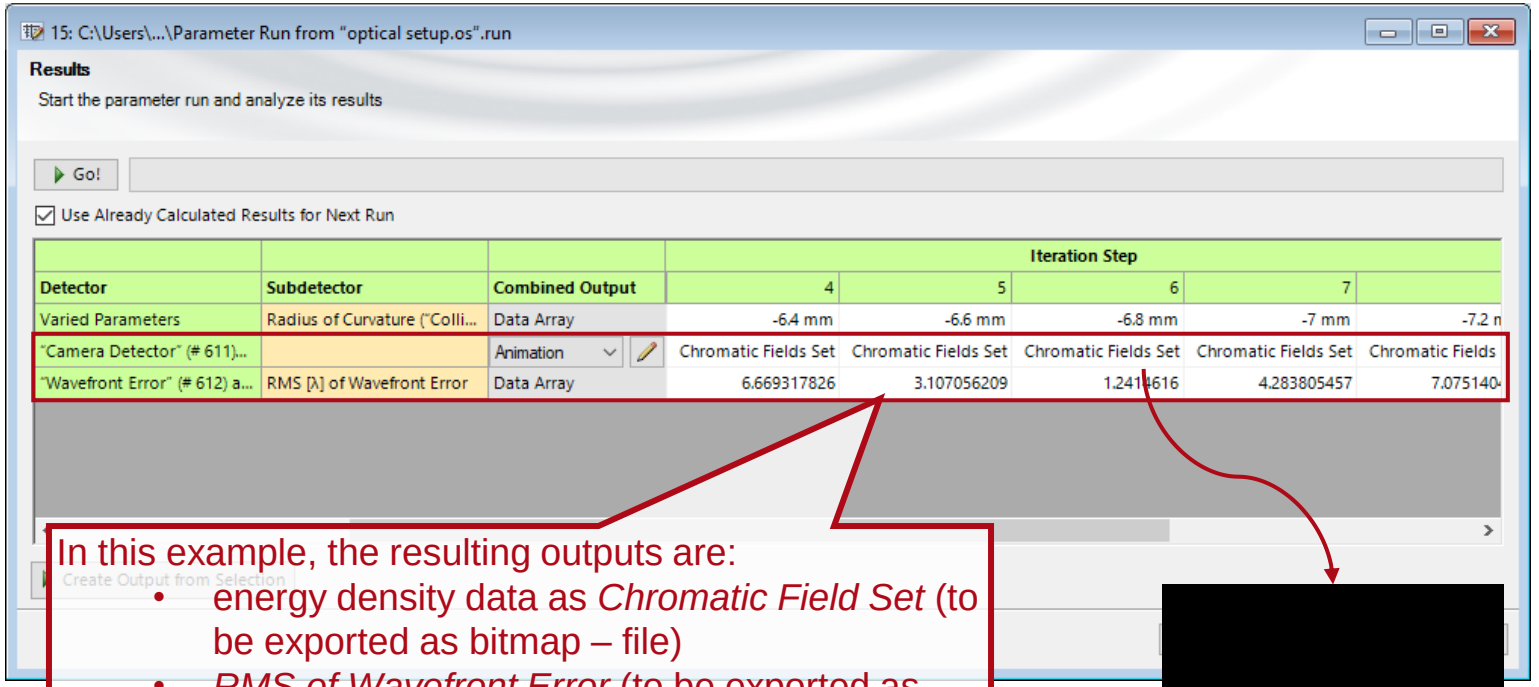
See the full Use Case:

Collimation of Astigmatic Diode Laser Beam by Objective Lens

Example: Collimation of Astigmatic Diode Laser Beam

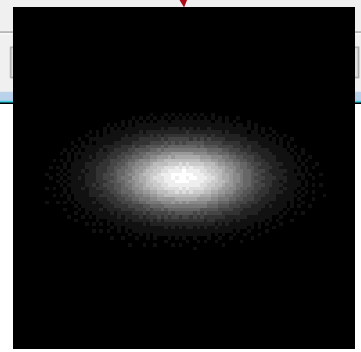


For demonstration purposes, we take a closer look at the effect of the radius of curvature of the first surface of the lens, when it varies between -5.8mm and -7.8mm.



In this example, the resulting outputs are:

- energy density data as *Chromatic Field Set* (to be exported as bitmap – file)
- *RMS of Wavefront Error* (to be exported as text – file)



More information on the *Parameter Run* document:

Usage of the Parameter Run Document

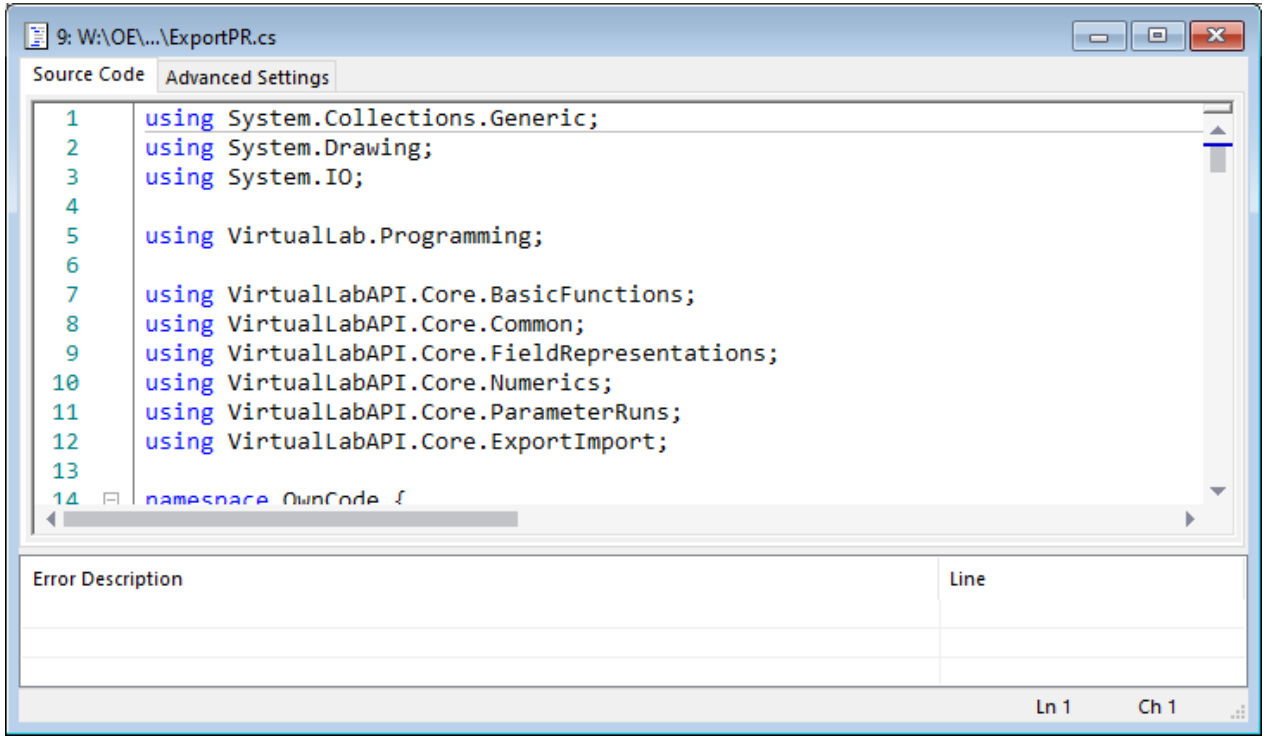
Export of Data

Due to the flexible programming capabilities of VirtualLab Fusion, a module can be used in order to export the data from the Parameter Run into the desired file format, such as:

- VirtualLab Fusion documents
- bitmap files
- text files

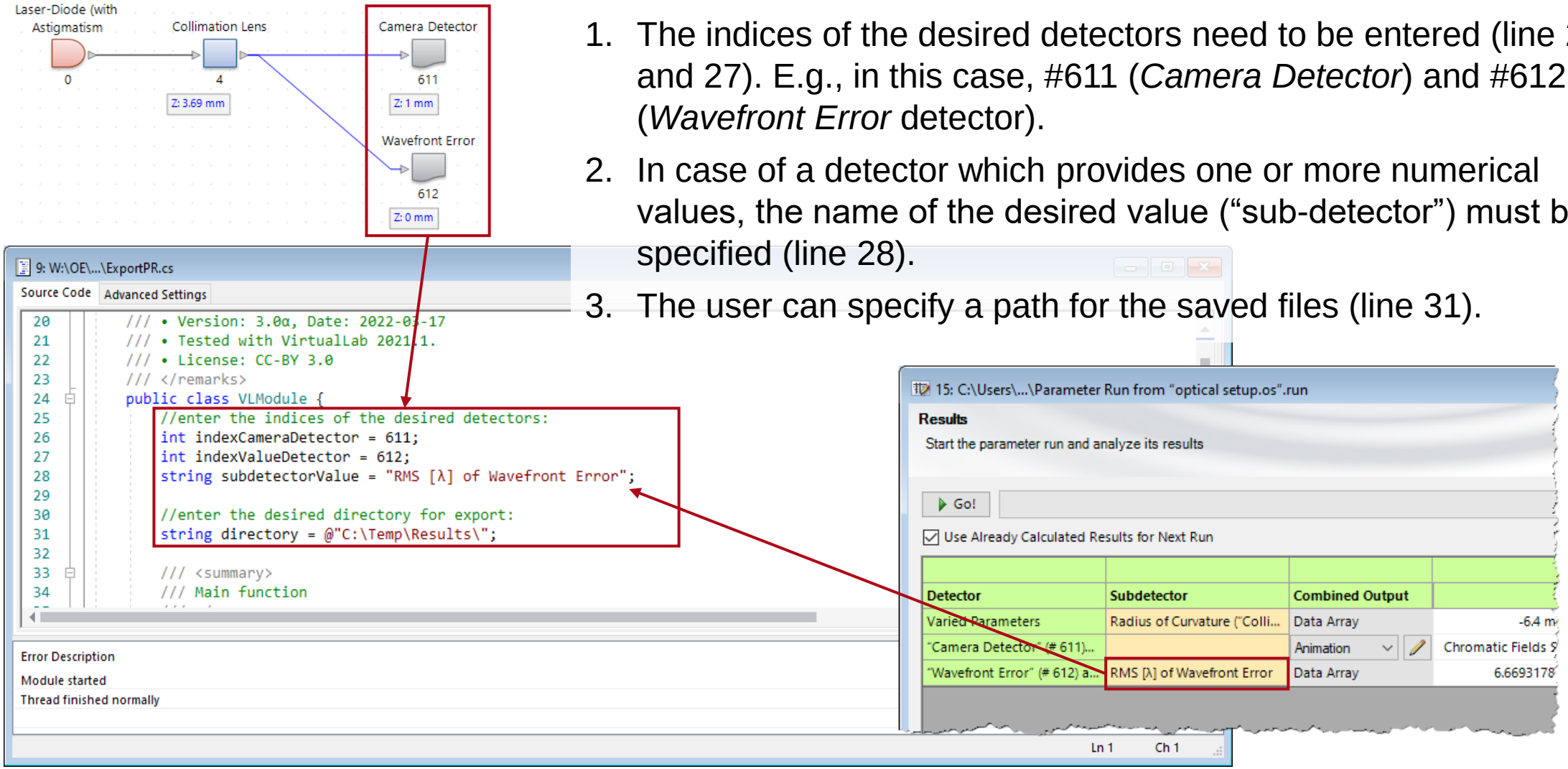
For a detailed look at the operation of modules, see:

How to Work with the C# Module and Example



Note: Inside the module, some settings require a few adaptations in order to customize the code with regards to the particular Parameter Run in question, as shown in the next slide.

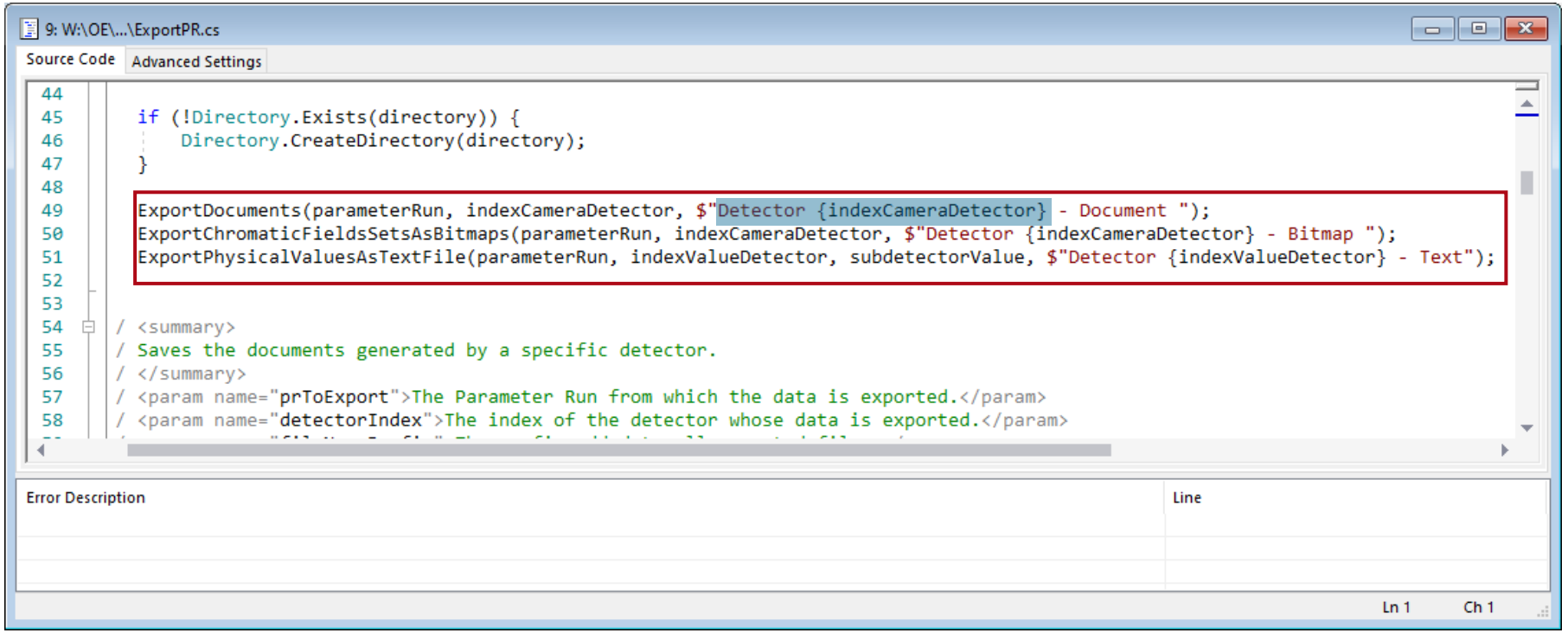
Module Adaptation



1. The indices of the desired detectors need to be entered (line 26 and 27). E.g., in this case, #611 (*Camera Detector*) and #612 (*Wavefront Error* detector).
2. In case of a detector which provides one or more numerical values, the name of the desired value (“sub-detector”) must be specified (line 28).
3. The user can specify a path for the saved files (line 31).

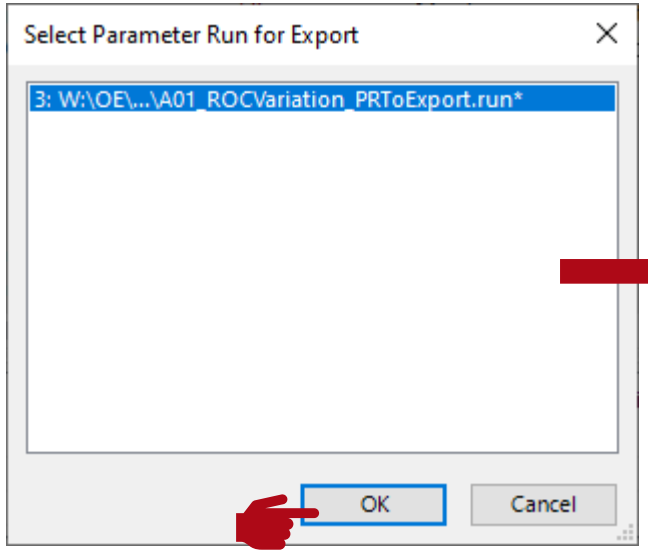
Module Adaptation

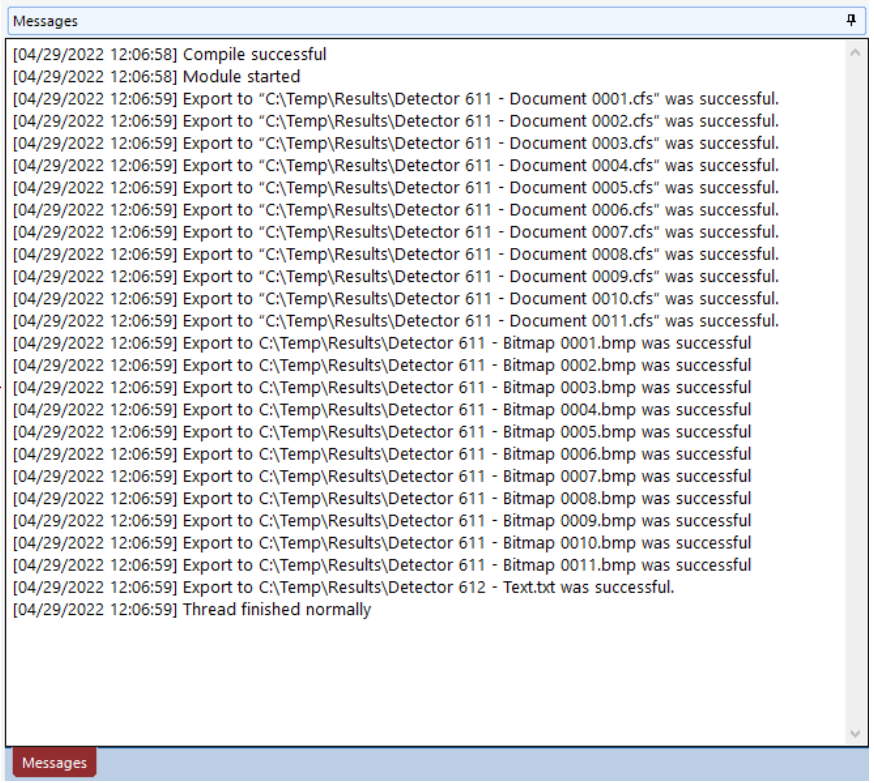
- By default, both the 2D output data and the numerical data can be exported (line 49, 50 and 51).
- If only one of the two data types is desired as output, the unwanted export commands can be commented out or deleted.
- The naming consists of a string clarifying the detector index and the number of each iteration step of the parameter run (marked below in blue).



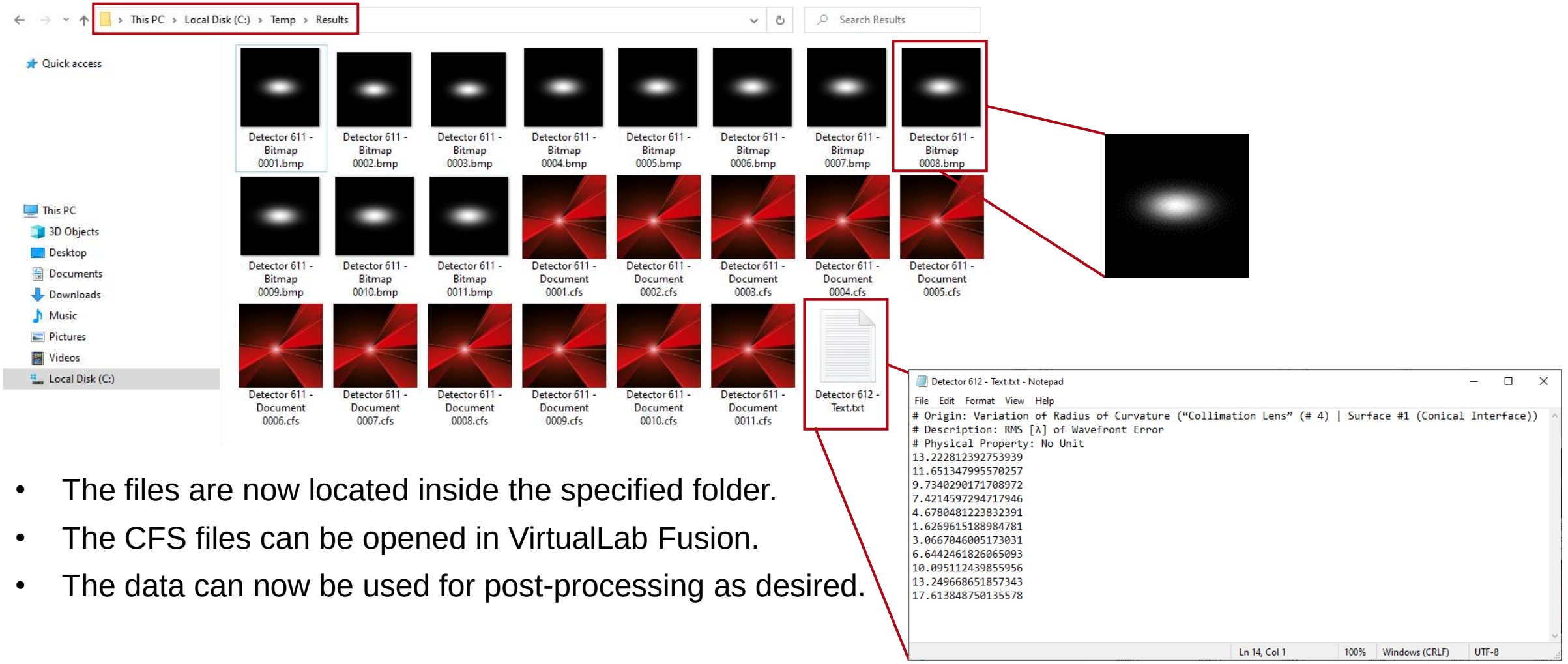
Run the Module

- After adapting the module, it can be executed (by clicking on *Go* in the *Module* tab or by pressing F5).
- In the pop-up dialog, please choose the desired Parameter Run (as shown below).
- The details of the export process are logged in the *Messages* information panel (normally at the bottom of the VirtualLab Fusion window).





Exported Results



- The files are now located inside the specified folder.
- The CFS files can be opened in VirtualLab Fusion.
- The data can now be used for post-processing as desired.

Document Information

title	Export of Results of a Parameter Run
document code	MISC.0064
document version	1.1
software version	2021.1 (Build 1.180)
software edition	VirtualLab Fusion Basic
category	Application Use Case
further reading	- How to Work with the C# Module and Example - Usage of the Parameter Run Document - Tolerancing with Random Distributions using the Programmable Mode of the Parameter Run