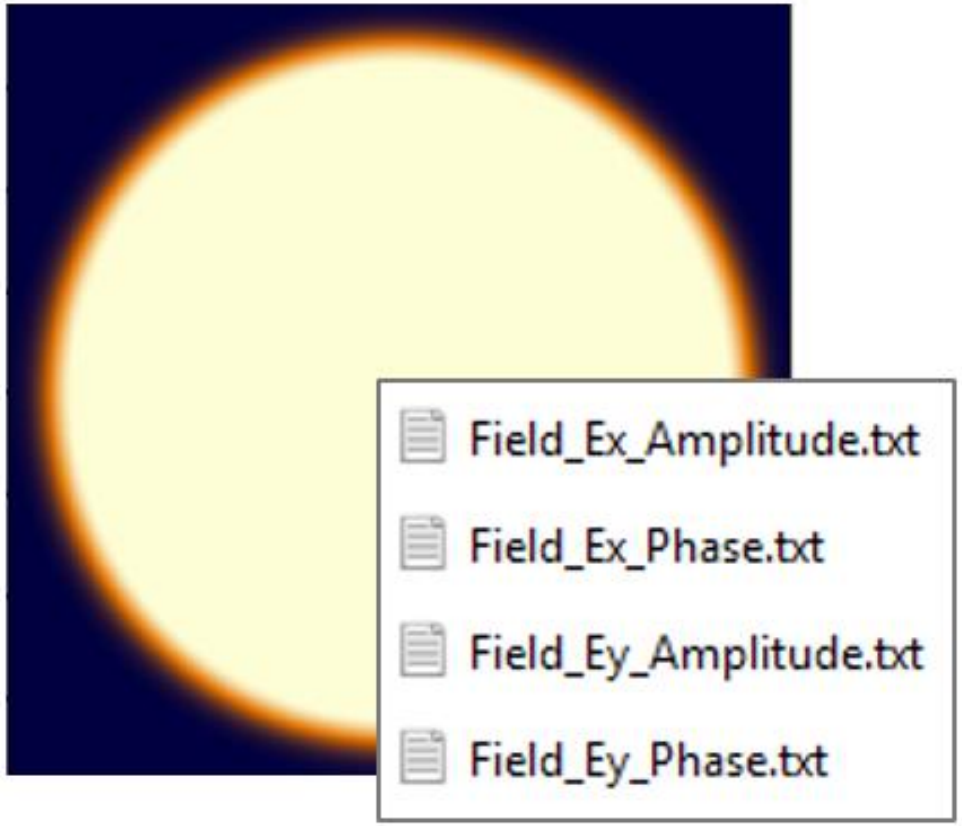
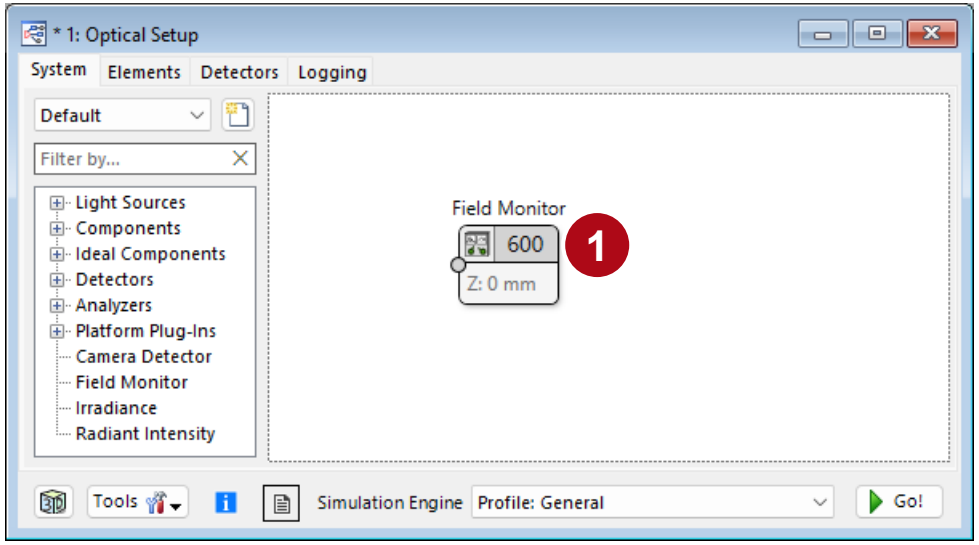
Exporting Field Data to TXT/CSV Files

Abstract



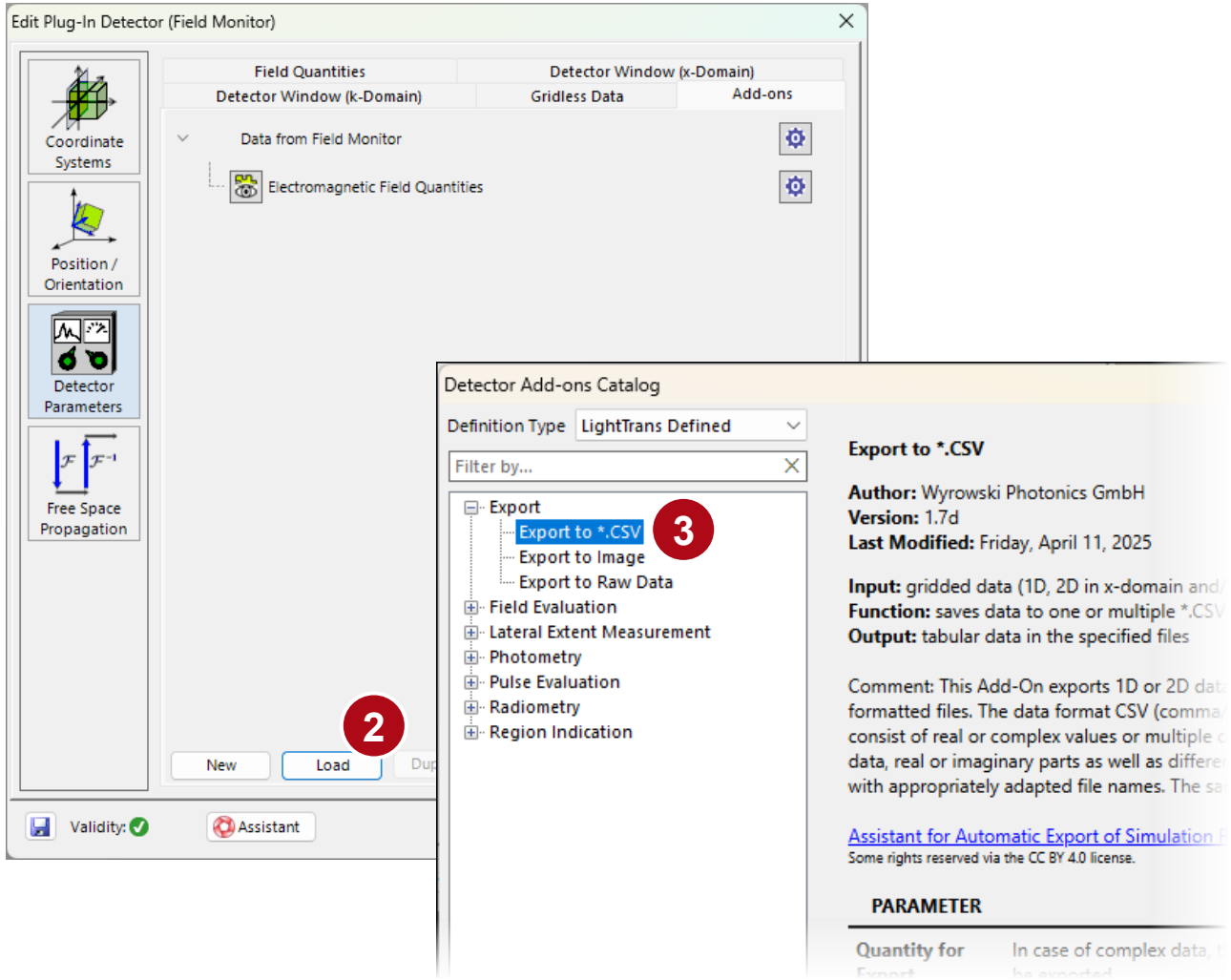
This tutorial shows how the electromagnetic field data of the detector obtained and processed from the simulation in VirtualLab Fusion can be automatically exported into a text format, for example for further use in other software. For this purpose, the add-on concept of the Field Monitor is used.

Export via Add-on

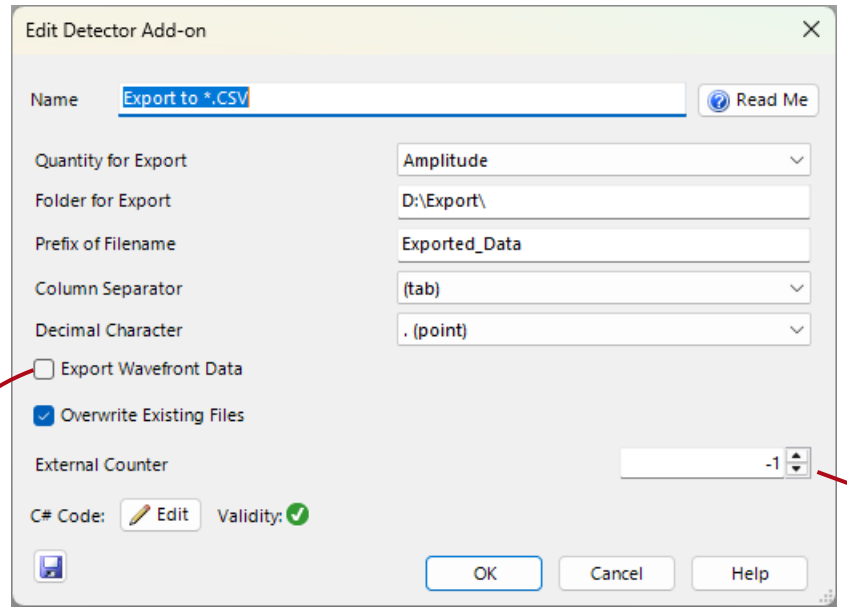


A convenient method for exporting field data is to utilize the *Export to *.CSV* detector add-on within the *Field Monitor*.

More information about the Field Monitor and the detector add-on concept can be found here.



Configuration of the Export



Each export add-on has its own configuration options, which are explained in the respective Read Me or in the corresponding Assistant Entry in more detail.

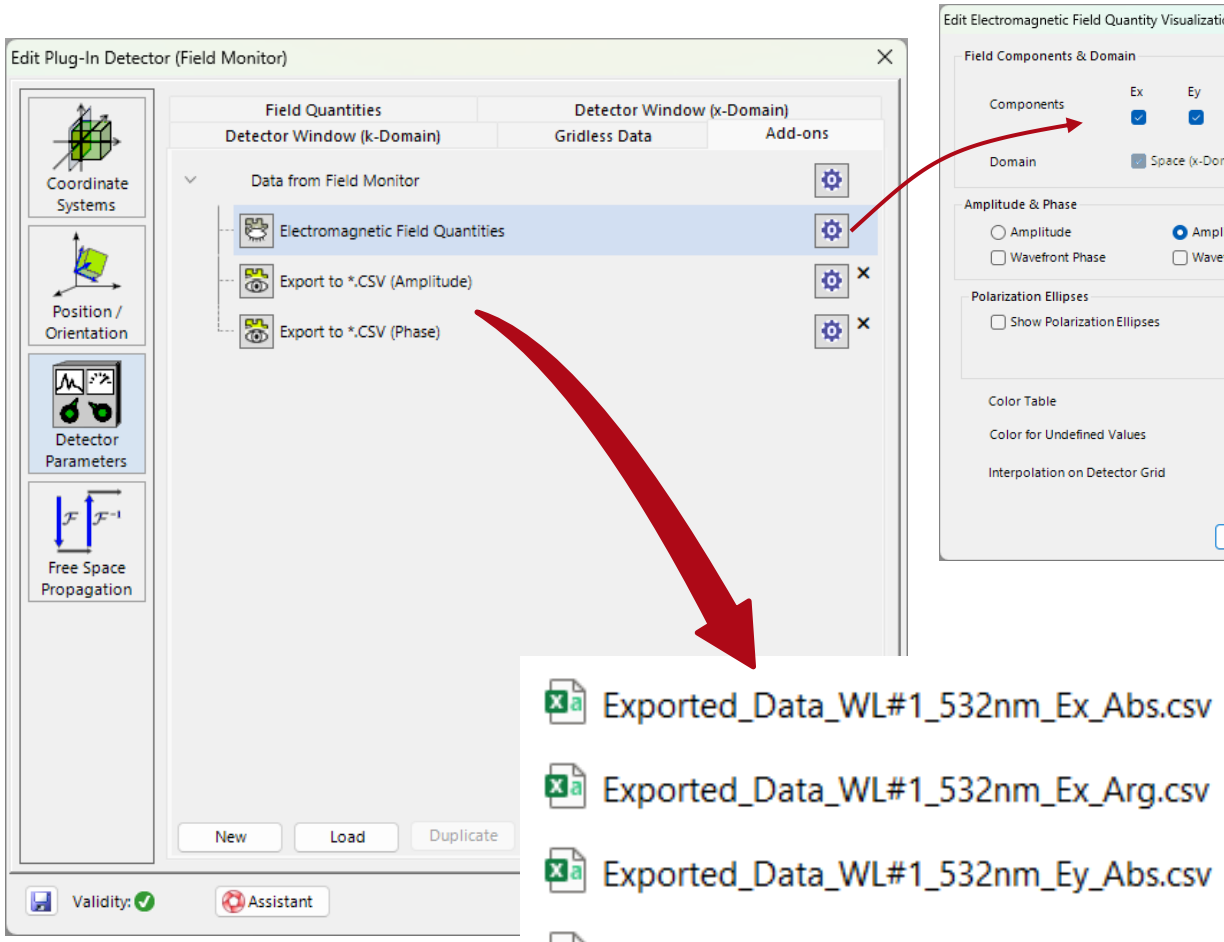
The options are:

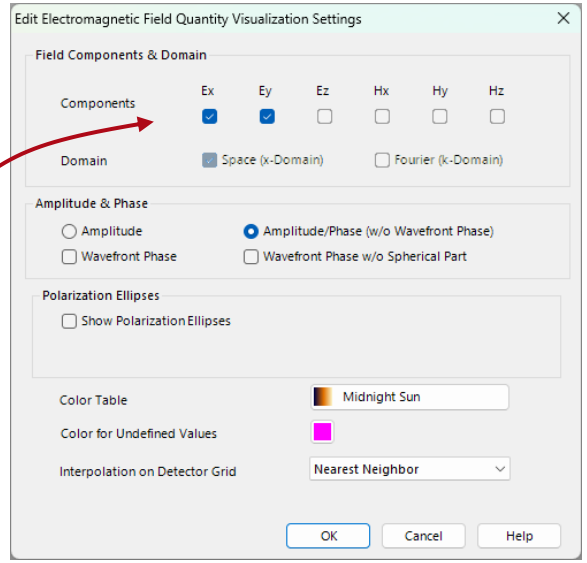
- Which folder should be exported to?
- Should there be a prefix in each filename?
- Should the wavefront be exported, too?
- Which separators shall be used?
- Should existing files be overwritten?

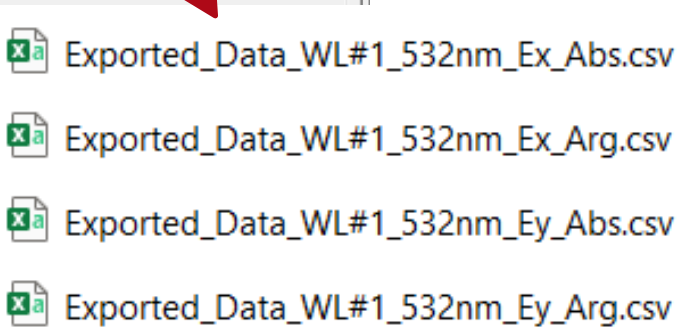
VirtualLab Fusion extracts the smooth wavefront phase from the field. It can be exported via this option or applied to the field via an additional detector add-on. The details of the phase and wavefront phase will be discussed later in this document.

The *External Counter* parameter is mainly used, when using the *Parameter Run* document where each exported result should get an additional unique number, see the Assistant Entry for more details.

Exported Components and Quantities



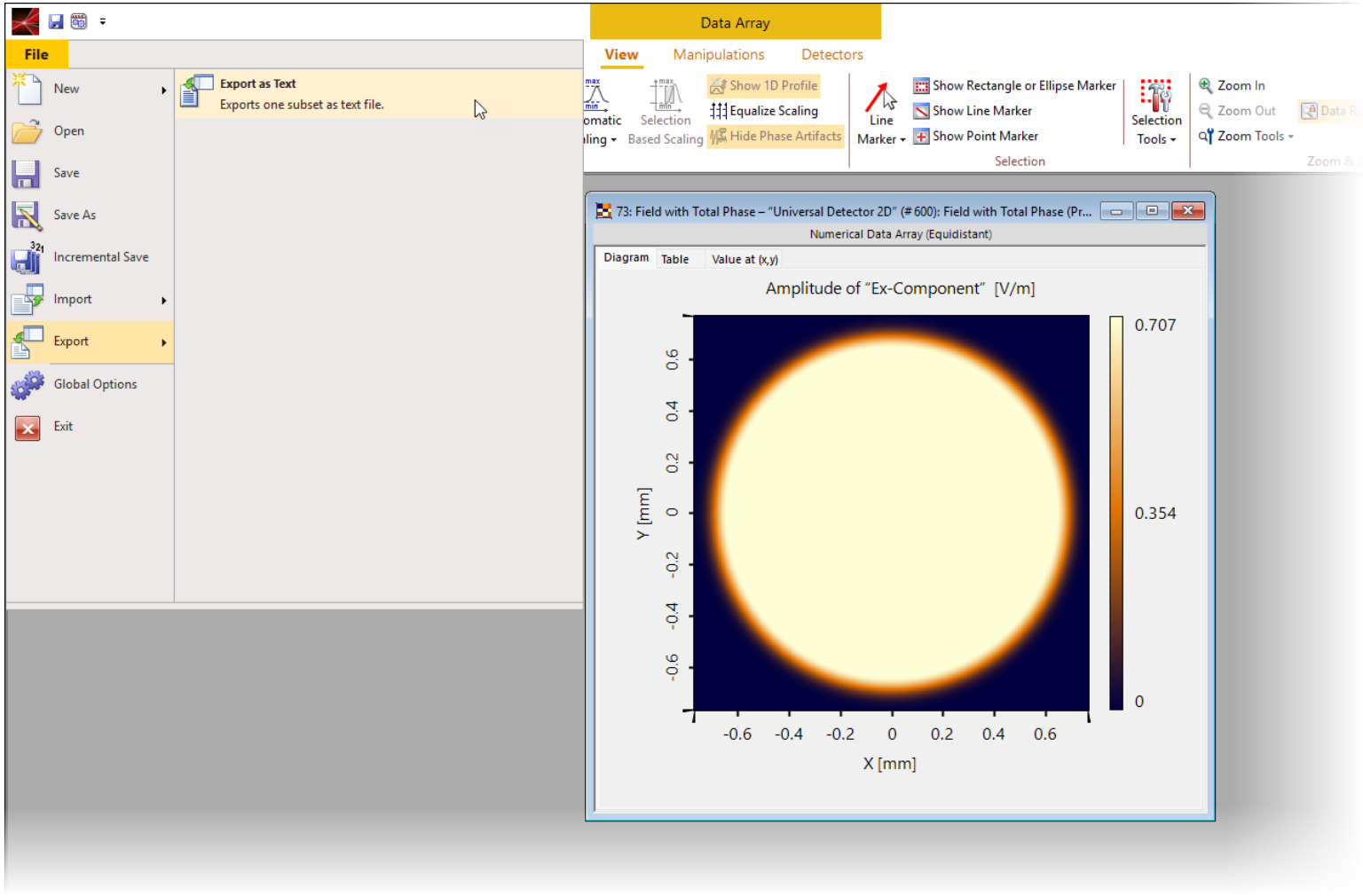




The export add-ons automatically export all components listed in the tab configuration dialog of the *Electromagnetic Field Quantities* add-on ($\mathbf{E_x}$ and $\mathbf{E_y}$ in the adjacent dialog box).

Only one field quantity can be selected at a time within the add-on. Therefore, to obtain both amplitude and phase data, the add-on must be used twice (for clarity, the names have been adjusted to indicate which add-on exports the amplitude and which exports the phase).

Export Field via Main Menu



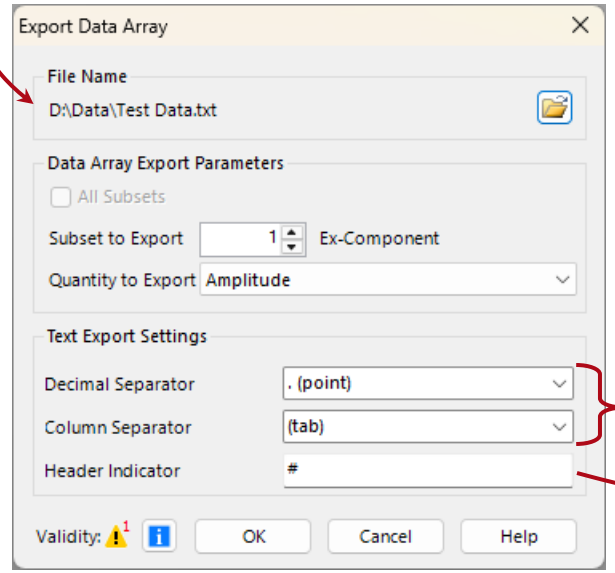
The export can also be performed on the field data array document, either by applying the export add-on directly via the ribbon Detector > Apply Detector Add-on:

In this case the configuration is as previously shown.

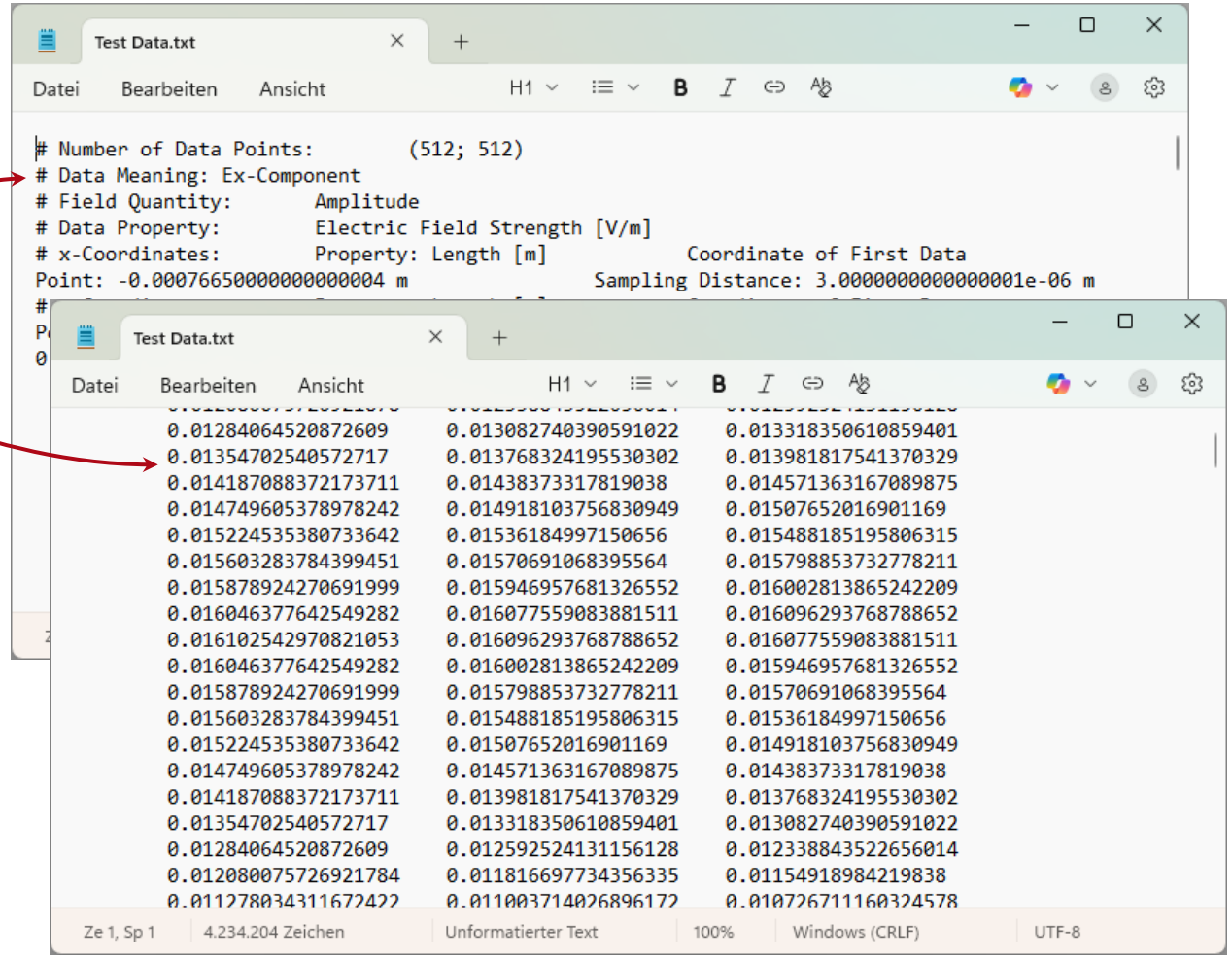
Alternatively, it is also possible to use the traditional workflow via *File > Export > Export as Text.*

Configuration of the Export (Traditional Export)

Location of the exported file



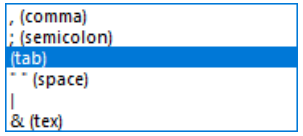
The header contains additional information, such as sampling parameters.



Decimal and column separation symbols can be adjusted, e.g., export directly to CSV (comma separated values) format.

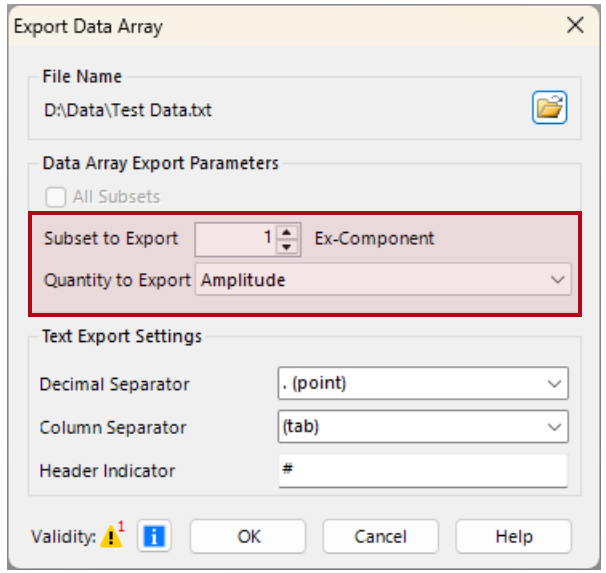
Decimal Separator

Column Separator

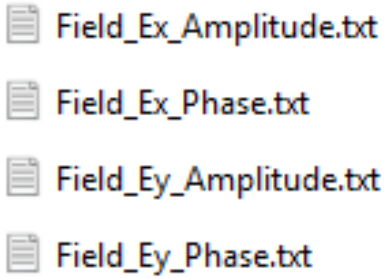


Export of Components and Field Quantities

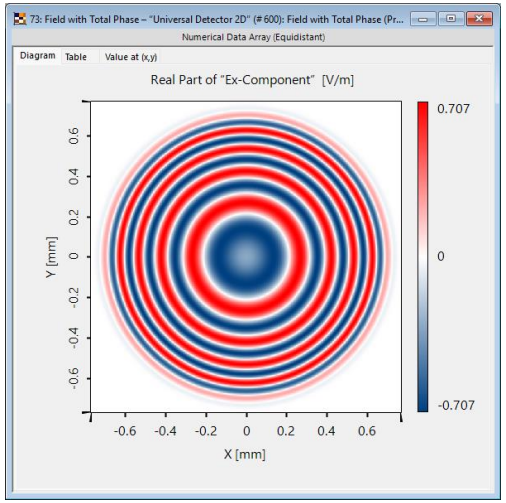
With this method, field components and quantities are exported separately.



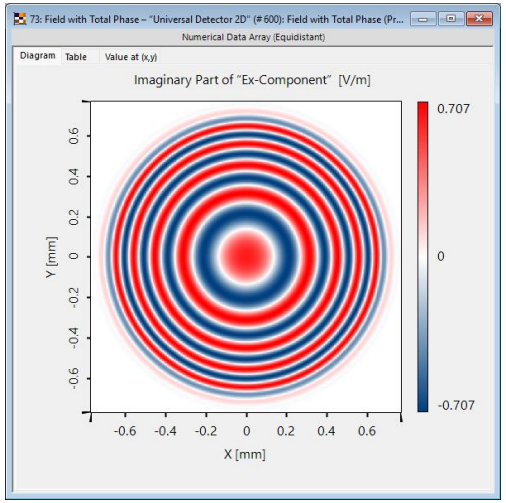
Therefore, to export the complete field information, at least four files should be generated: amplitude and phase (or real and imaginary parts) of $\mathbf{E_x}$ and $\mathbf{E_y}$.



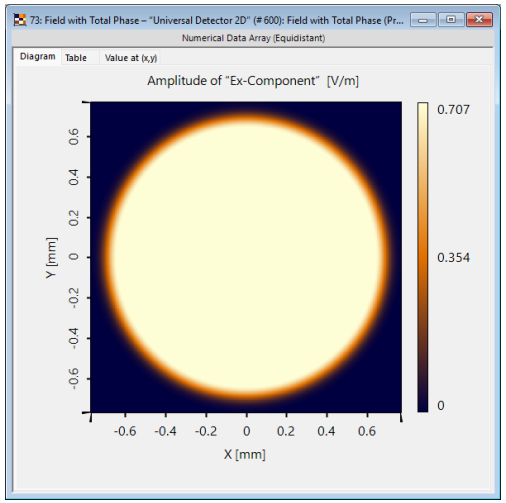
Real Part



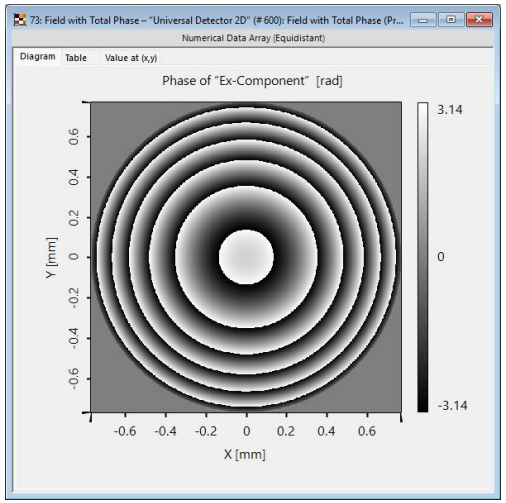
Imaginary Part



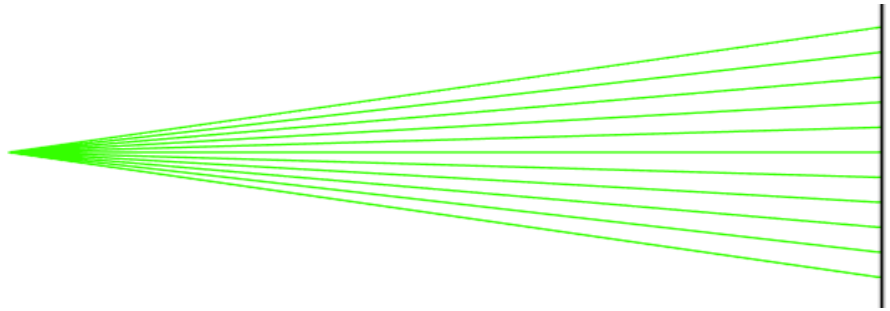
Amplitude



Phase



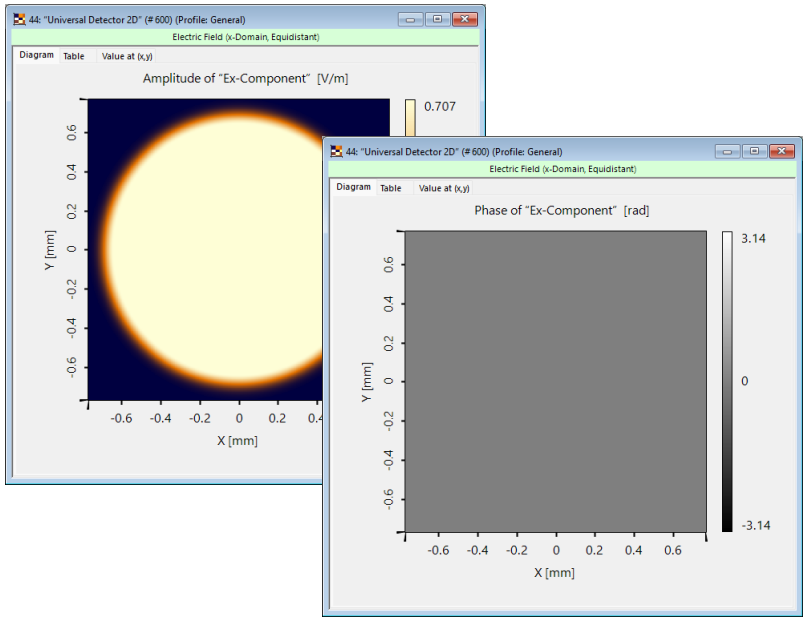
Phase and Wavefront Phase in VirtualLab Fusion



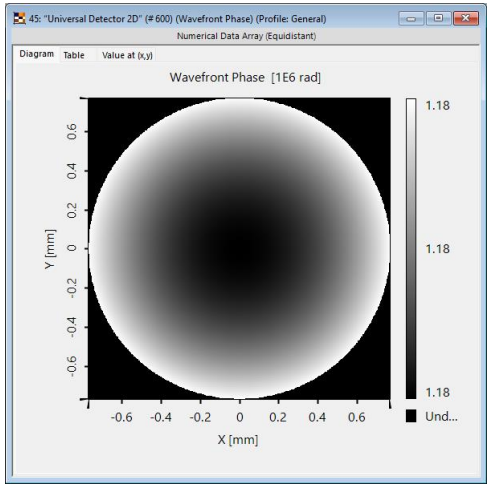
example field from spherical wave

When possible, VirtualLab Fusion treats smooth wavefront phase data ψ separately. By default, the *Field Monitor* outputs the field data without ψ. The detector offers the possibility to export the smooth wavefront phase data separately or – via add-on – even to combine it with the other phase data.

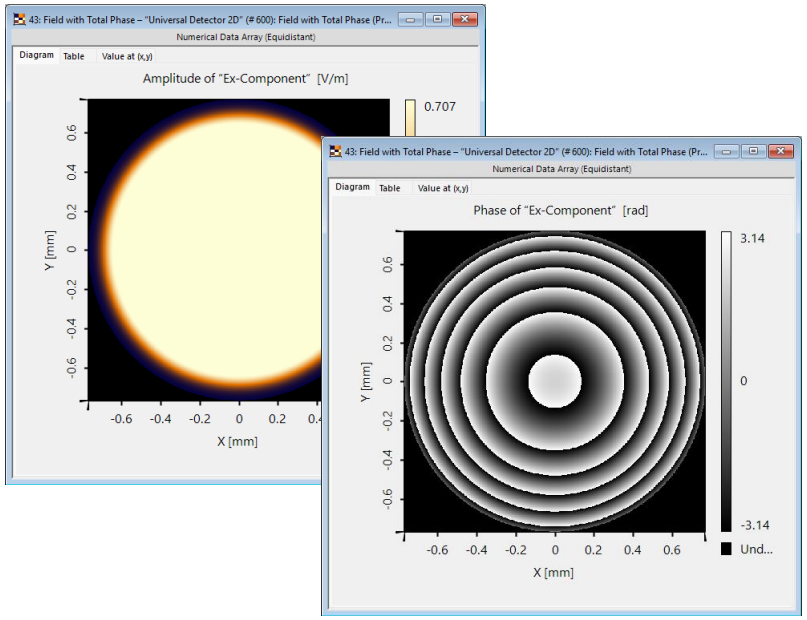
field without wavefront phase
(amplitude & possible residual phase values)



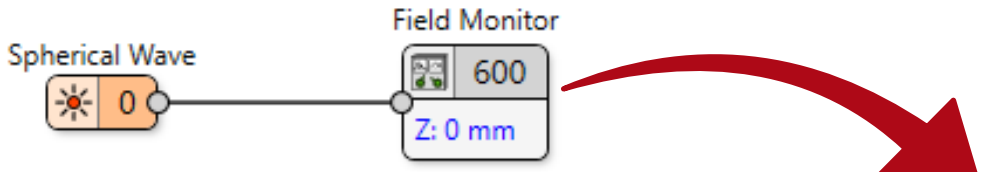
wavefront phase



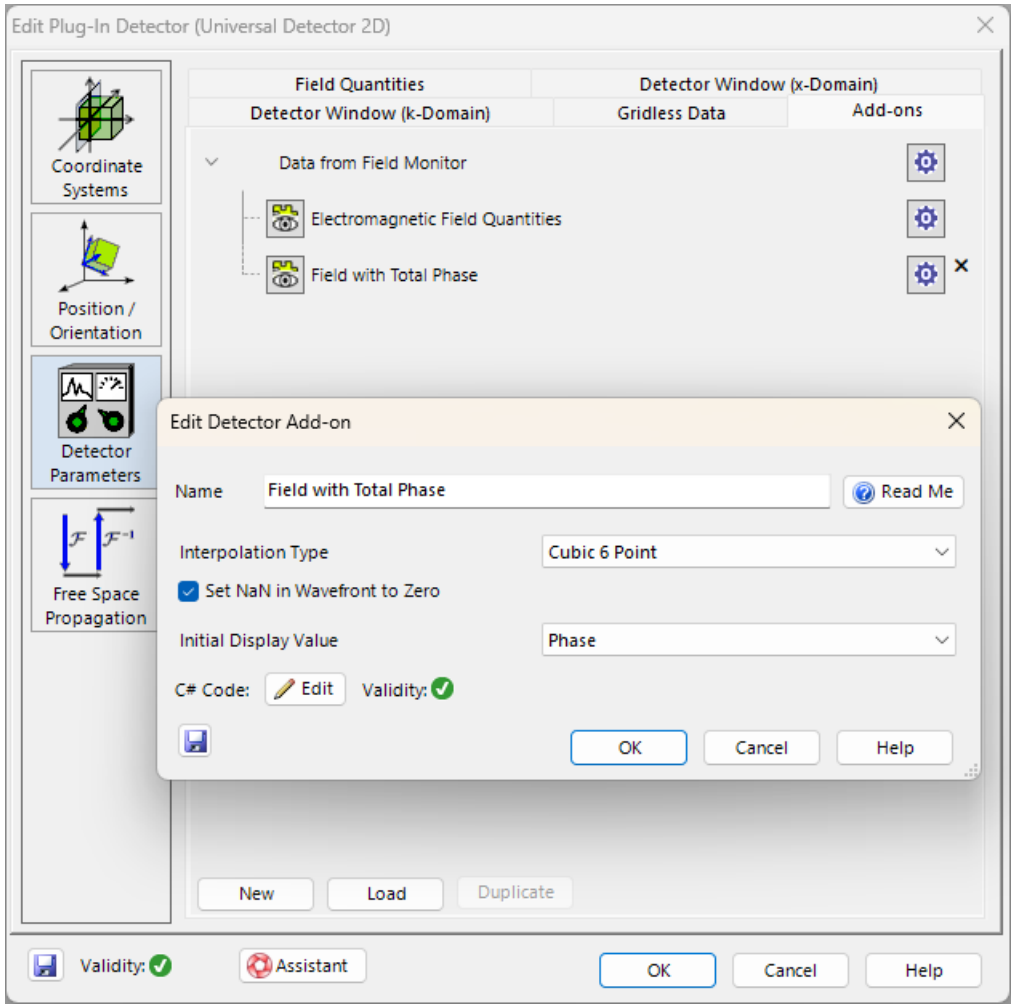
field with total phase (in wrapped form, i.e., in 2π modulo format of complex representation)



Field with Total Phase Detector Add-on



The total phase can be calculated using the *Field with Total Phase* add-on for the *Field Monitor*, available under the *Field Evaluation* category in the detector add-on catalog.



Document Information

Title	Exporting Fields into CSV Files
Document code	TUT.0468
Publication date	18.11.2025
Required packages	-
Software version	2025.2 (Build 1.118)*
Category	Use Case
Further reading	- Automatic Export of Simulation Results via Add-on - Plug-In Detector

* *The files attached to this document require the specific version or later.*