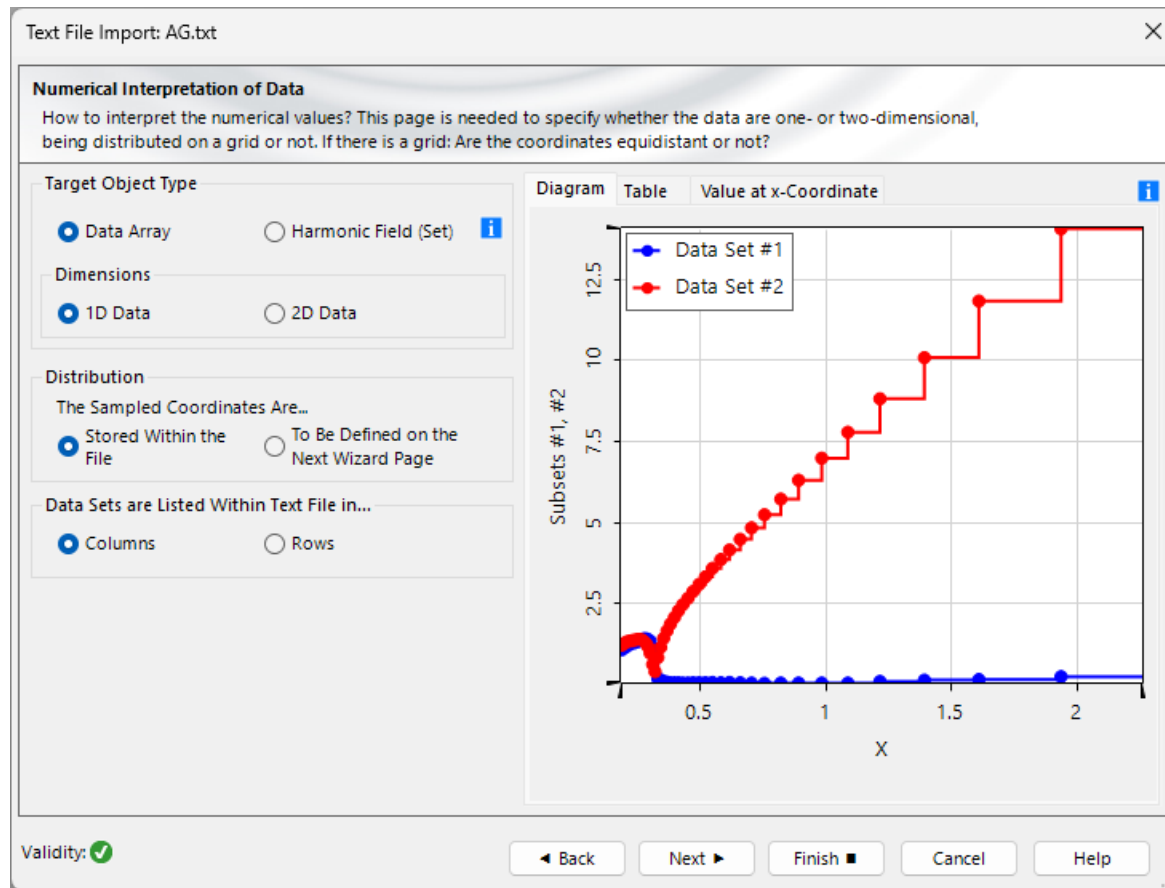


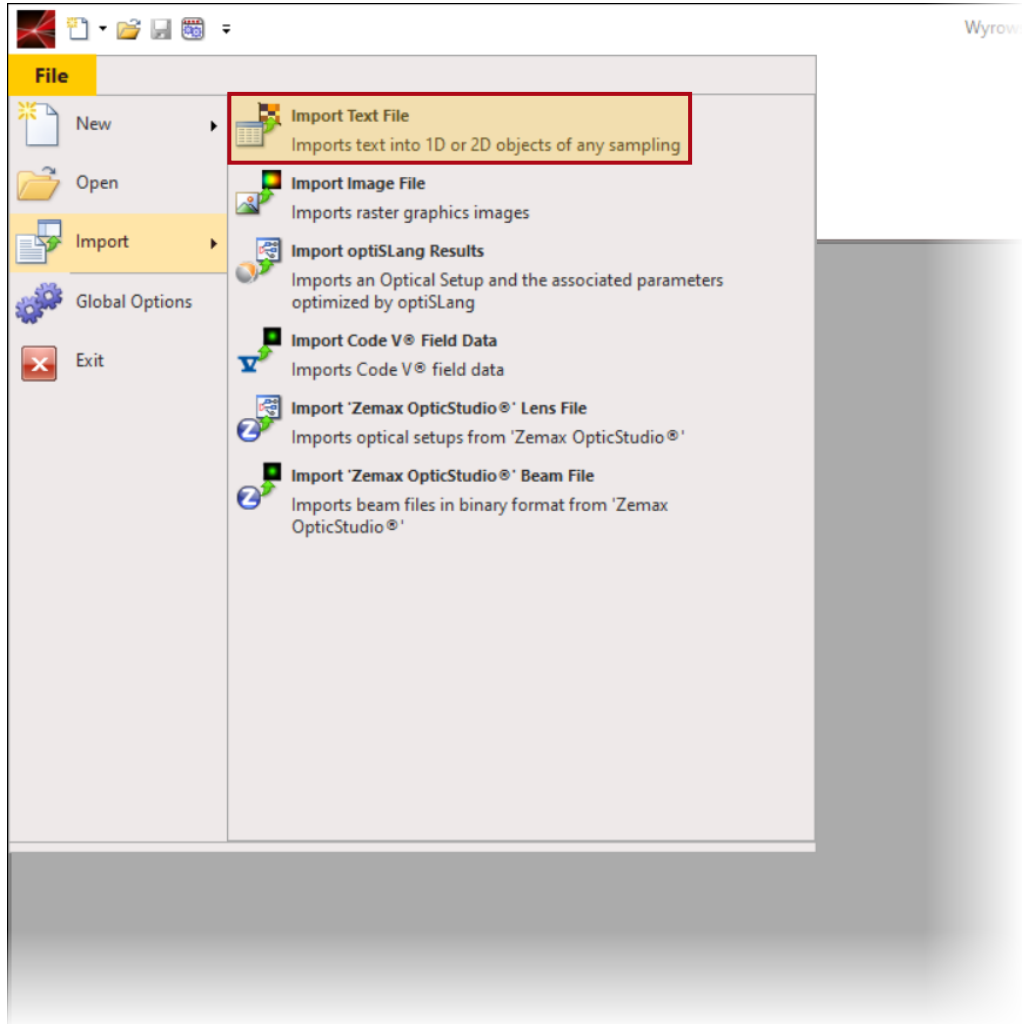
# Import Text Files into VirtualLab Fusion

# Abstract



VirtualLab Fusion provides an intuitive workflow for data importation, supporting various data formats. Users can import 2D data arrays, (such as field data) or both equidistant and non-equidistant 1D arrays, e.g., dispersion curves for specific materials. This Use Case introduces a tool that enables users to import data from any type of text file.

# Import of Text Files



You can access the import tool by navigating to File > Import > Import Text File. It supports various custom text data formats like txt or csv files.

# Import Text Files

In the *Relevant Content* section, the order and extent of the import can be determined. The *Handling of Rows and Columns* section specify which symbols in the data VirtualLab Fusion shall interpret as e.g. column or decimal separator.

The "Suggest Characters" button automatically adjusts fitting parameters for the entire *Handling Rows and Columns* section.

Text File Import: Focus.txt

**Parsing of Text**  
Some basic information for converting the text into numerical values are needed first.

**Relevant Content**

Read Rows  
from: First Row  
to: Last Row

Ignore First: 0 Characters in Row

Suggest Characters  Contains Complex Values

**Handling of Rows and Columns**

Skip Lines Starting with: #

Column Separator: Any Whitespace

**Handling of Numbers**

Decimal Separator: Point

Digit Group Delimiter: (None)

1	# Number of Data Points:	"(512; 512)"	
2	# Data Meaning:	Spectral Irradiance for Wavelength of 532 nm	
3	# Wavelength:	532 nm	
4	# Data Property:	Power per Volume [W/m <sup>3</sup> ]	
5	# x-Coordinates:	Property: Length [m]	Coordinate o
6	# y-Coordinates:	Property: Length [m]	Coordinate o
7	0.20421441932111853	0.20659625255683392	0.208782659952949
8	0.20653160543890736	0.20866406273446508	0.210581978645965
9	0.20865503942059105	0.21051939536715419	0.212153369226986
10	0.21055389601607821	0.21213497692292668	0.213473425679258
11	0.21219528397483584	0.21348170656077958	0.214517110332867
12	0.21354480966003742	0.21452919111111457	0.215258257180169
13	0.2145592247417541	0.21523809769941296	0.215661655856938
14	0.21509768512305188	0.21546804483590057	0.215587971352
15	0.21515984497112217	0.2152229274058341	0.21504553023186
16	0.21480105264227867	0.21456385060337874	0.214101149780965
17	0.21407879761230081	0.21355387436316633	0.212823347981472
18	0.21305122801328052	0.21225645816609628	0.211280717866013
19	0.21177581062261625	0.21073405448709759	0.209540456905888
20	0.21030813330414436	0.20904685088483982	0.207667051618595

Validity:

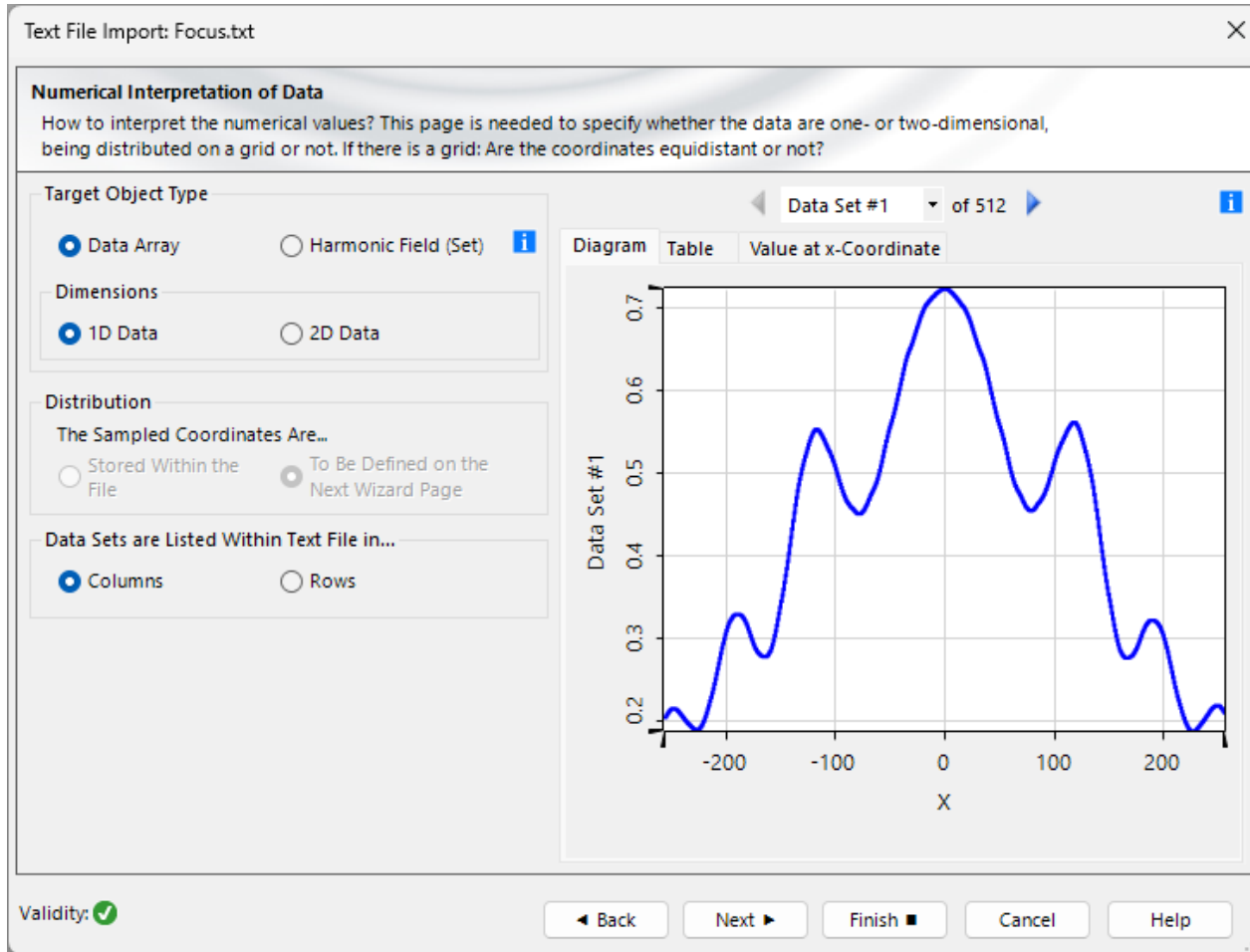
◀ Back Next ▶ Finish ■ Cancel Help

The header is visualized in grey. The *Skip Lines Starting with* – parameter determines what is interpreted as a header.

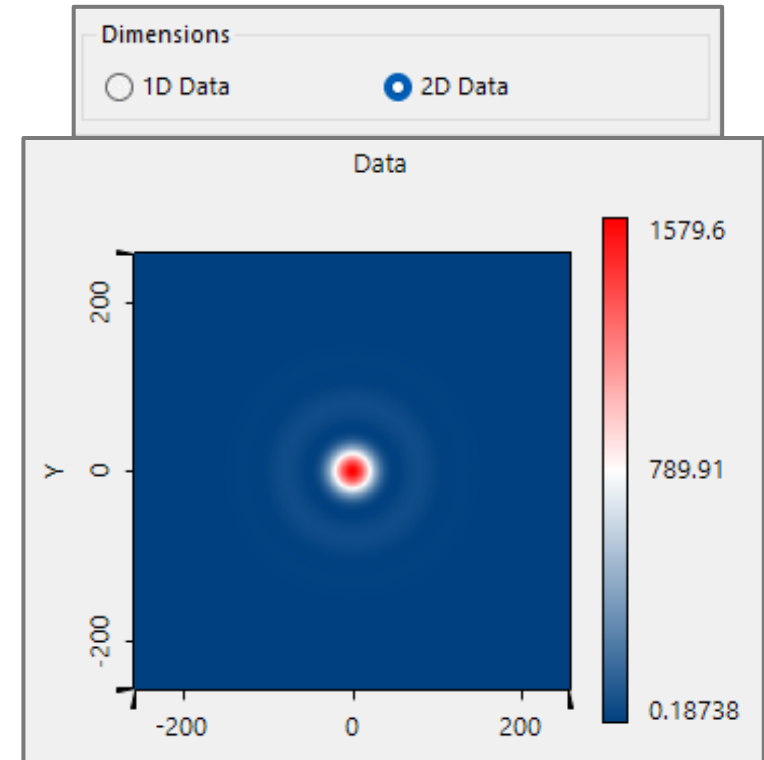
A preview will be displayed on the right side, highlighting any unreadable entries in red.

0.19204846821180518	0.19159047876251911	0.1914776449501
0.19152065400823526	0.191400560045907	0.191666736847
0.19123243412129931	0.191486275%\$483892114	0.192163789707
0.19112479425332107	0.19178886195207068	0.192909304629
0.1912701780565797	0.1923763424275664	0.1939662828131

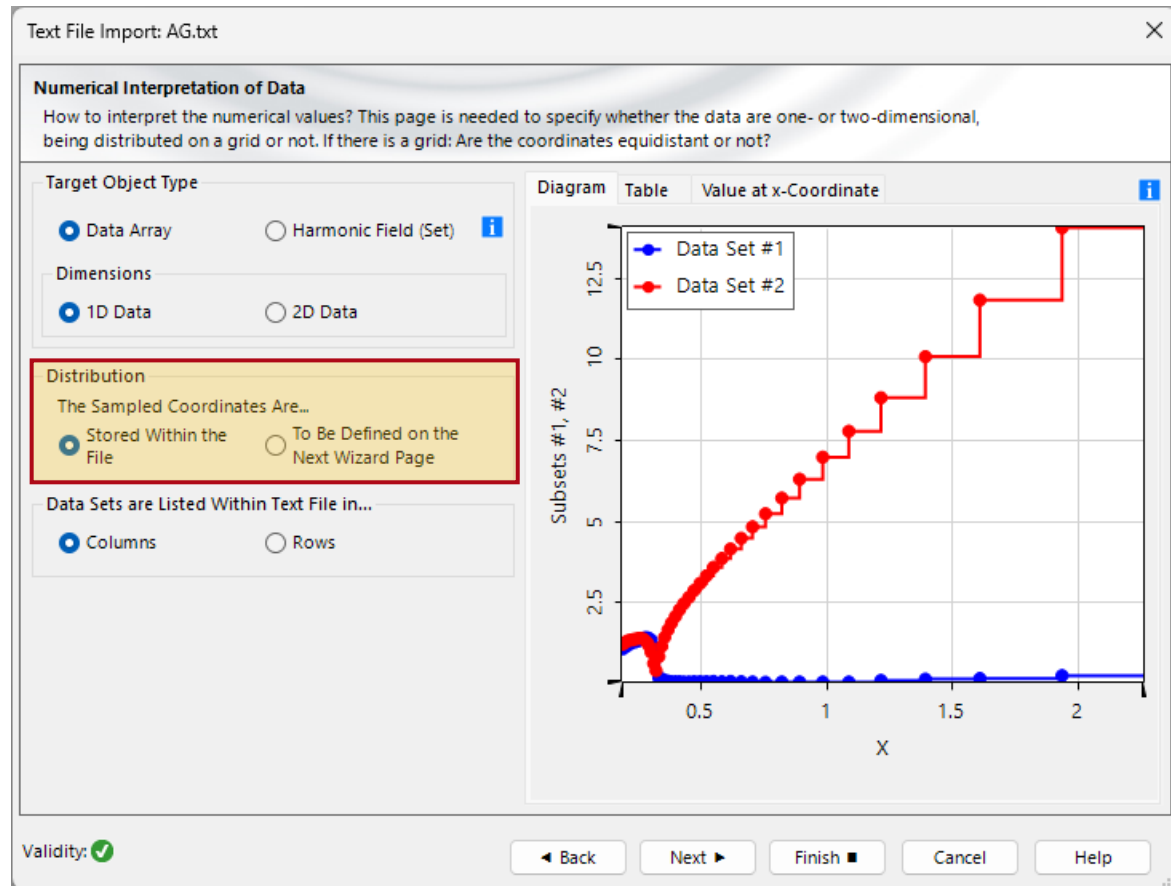
# Type of Data Array



1D and 2D data arrays can be imported. For 1D data with multiple subsets, the user can specify if the individual sets are represented by the columns or rows of the text file.



# Import of Non-equidistant Data Arrays



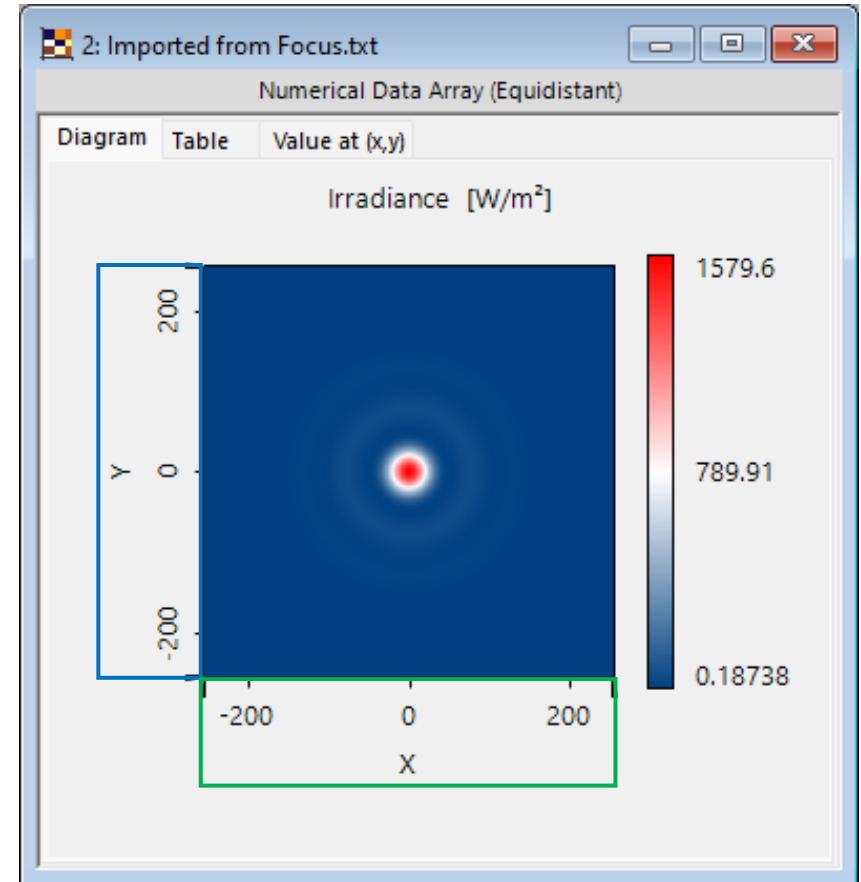
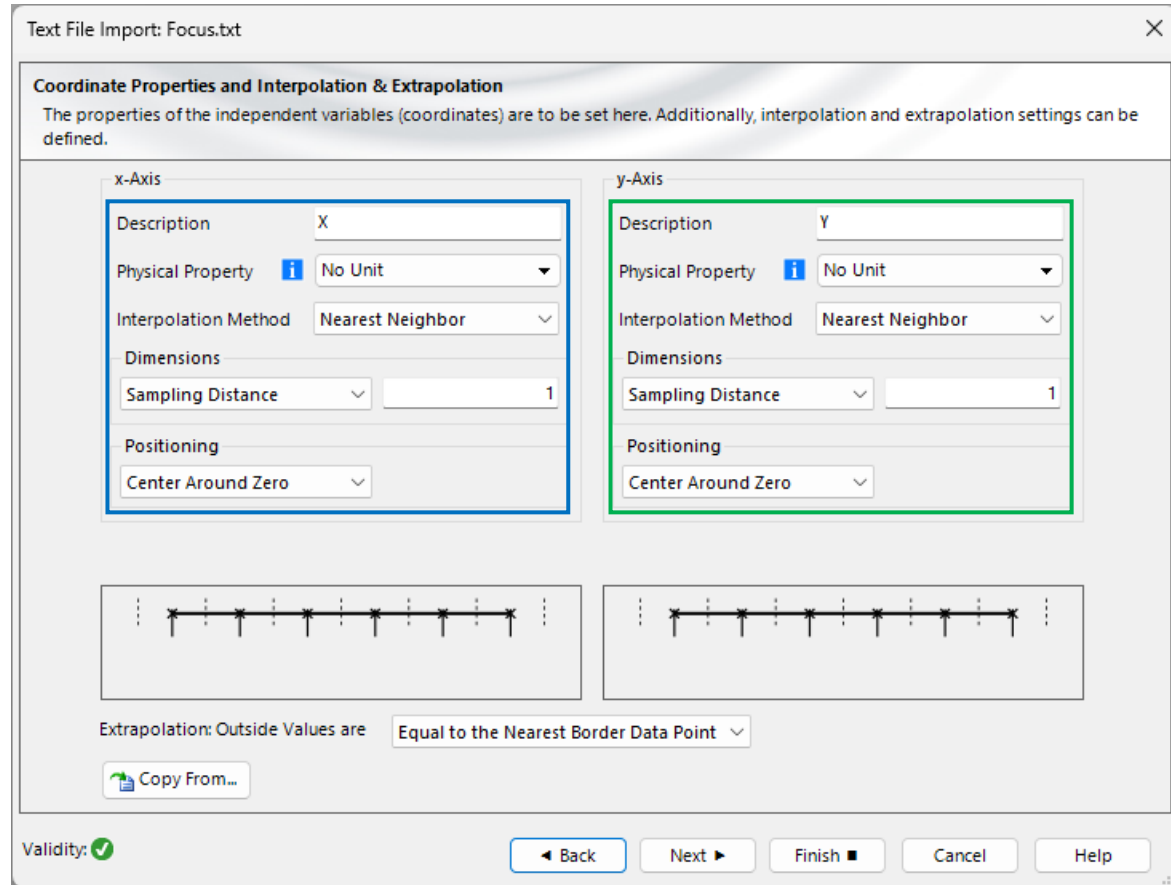
For non-equidistant data arrays, users can specify whether the coordinates are already provided in the file or need to be defined in the wizard. If the former option is chosen, the software extracts coordinates from the first column (or row). If the latter option is selected, the same workflow as for equidistant data follows.

coordinates

0,1879	1,07	1,212
0,1916	1,1	1,232
0,1953	1,12	1,255
0,1993	1,14	1,277
0,2033	1,15	1,296
0,2073	1,18	1,312
0,2119	1,2	1,325
0,2164	1,22	1,336
0,2214	1,25	1,342
0,2262	1,26	1,344
0,2313	1,28	1,357
0,2371	1,28	1,367
0,2426	1,3	1,378
0,249	1,31	1,389
0,2551	1,33	1,393

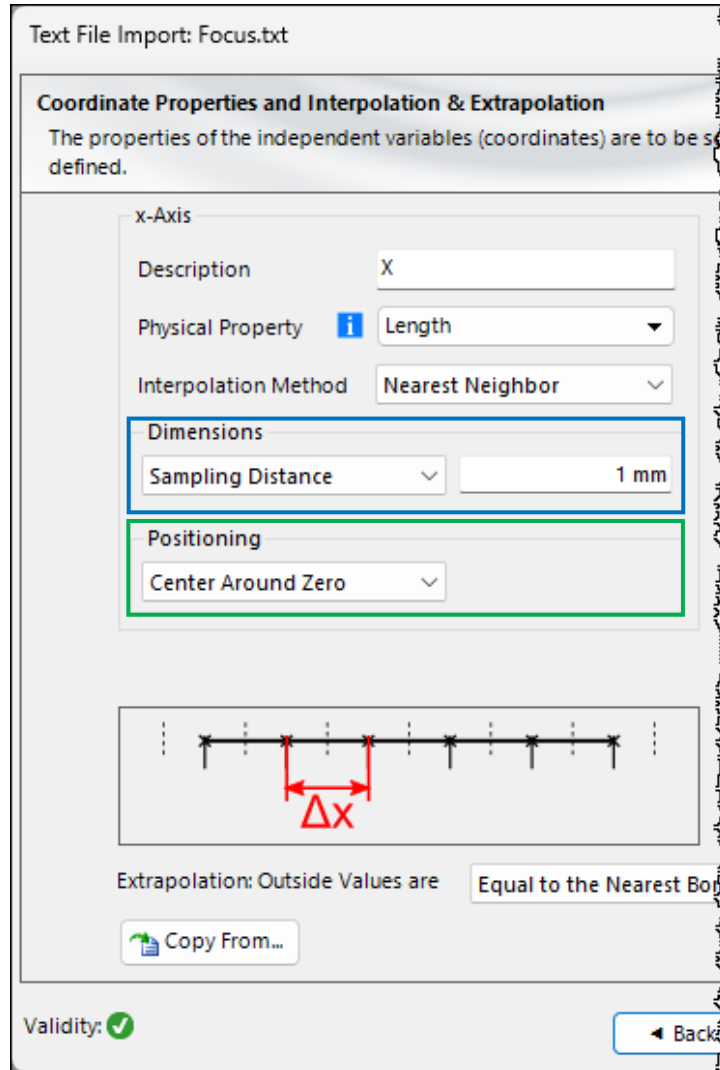
data

# Import of Equidistant Coordinates



For equidistant coordinates, sampling parameters such as the sampling distance and start-value needs to be specified by the user. The wizard will guide you through the process. Here, you can also directly name the coordinate axis and attach a unit to it.

# Definition of Coordinates – Dimensions and Positioning



To specify the physical coordinates of the data array, an origin (or start-value), the total number of points and the distance between two points are necessary. As the imported data array will already determine the number of sampling points, the other two parameters are specified in *Dimensions* and *Positioning* section, which provide multiple options to do so.

The **Sampling Distance** can either be defined directly, or ...

... by defining an **Array Size** and calculating: array size/(sampling number -1) or...

... by specifying a **Coordinate Extend** (and calculating it by coordinate extend/(sampling number +1))

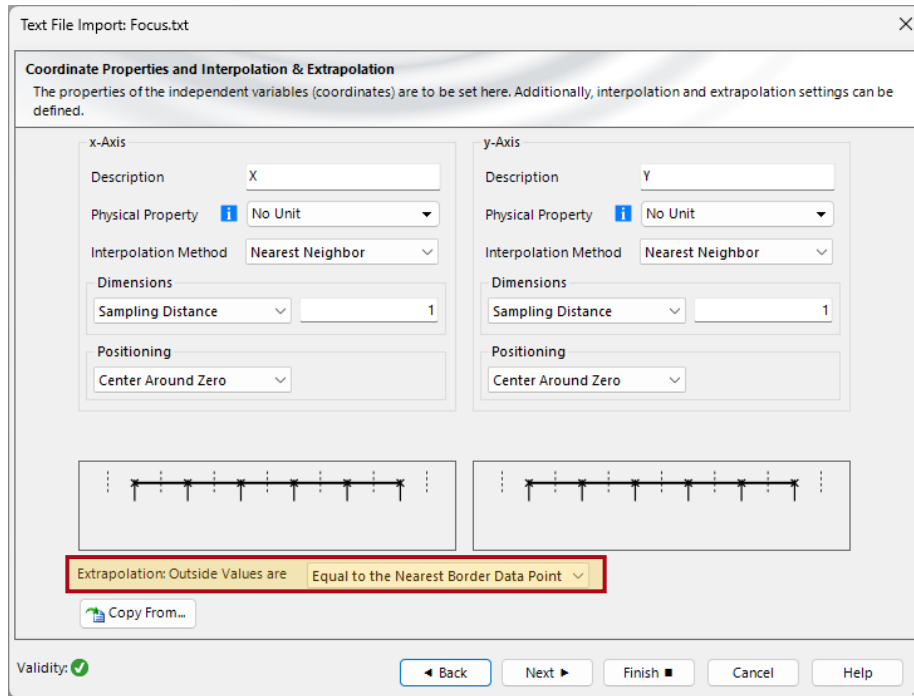
Likewise, the data array is either positioned by a **Start – Coordinate** or ..

... or by **Centering it Around Zero** ...

... or by **Centering it Around Zero Node**, meaning the data point closest to the middle will become 0.

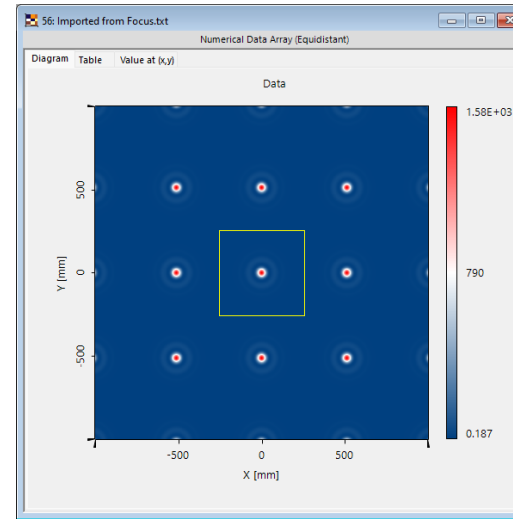


# Definition of Coordinates – Extrapolation

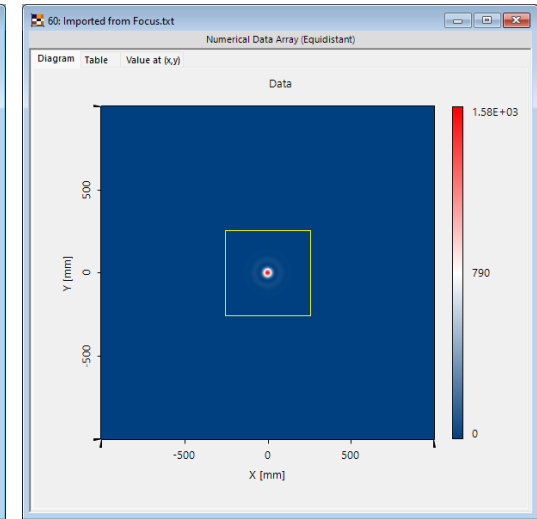


Imported data arrays are commonly finite in size. But as VirtualLab Fusion allows the visualization of the data outside of its given boundaries, the Extrapolation section defines how values outside of the boundaries shall be set.

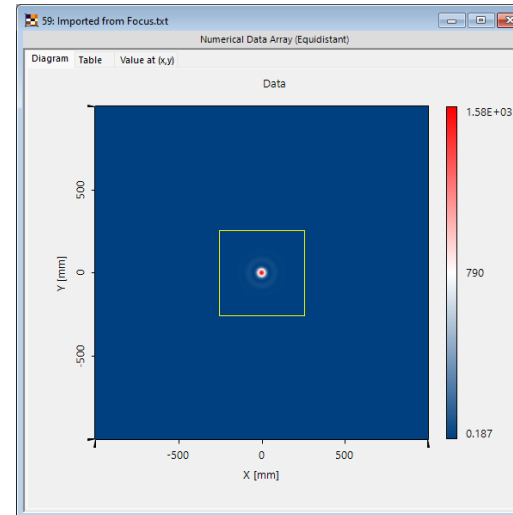
The options are: *Zero*, *Equal to Nearest Border Data Point*, *Constant with Value* and *Periodically Continued*.



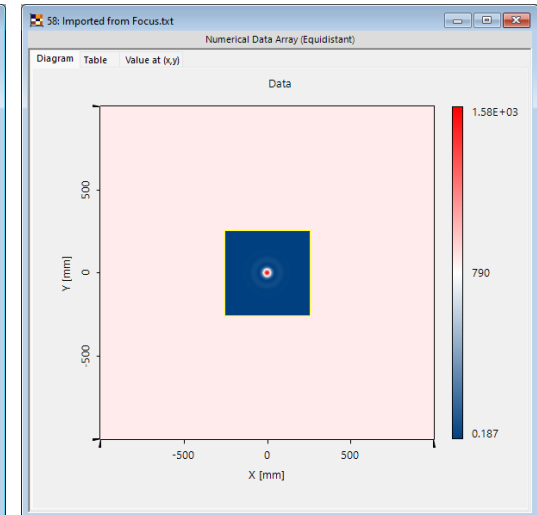
**periodically continued**



**zero**



**equal to nearest data point**



**constant with value**

# Physical Properties - Unit

Text File Import: Focus.txt

**Subset Properties**  
The properties of the dependent variables are to be set here.

Copy From...

Subset #	Description	Physical Property	Factor
1	Irradiance	Power per Area	1

Validity:

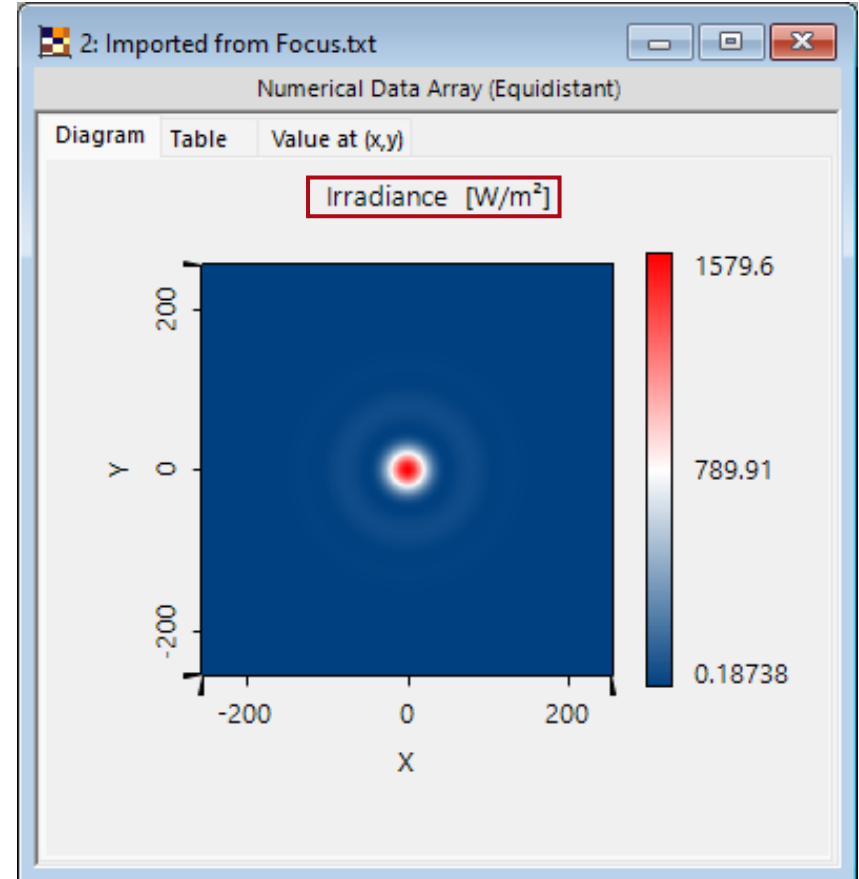
◀ Back   Next ▶   Finish ■   Cancel

Miscellaneous ▶  
Base Quantities and Reciprocals ▶  
Angles ▶  
Radiometry ▶  
Photometry ▶  
Environment ▶  
Densities ▶  
Dimensionless ▶  
Energy / Power ▶  
Fields ▶

- Absorption Coefficient
- Area per Energy
- (Area per Energy)<sup>2</sup>
- Energy (eV)
- Energy (J)
- Energy per Area
- Energy per Volume
- Power
- Power per Area
- (Power per Area)<sup>2</sup>
- Power per Solid Angle
- Power per Solid Angle and per Area
- Power per Volume
- Volume per Energy
- (Volume per Energy)<sup>2</sup>

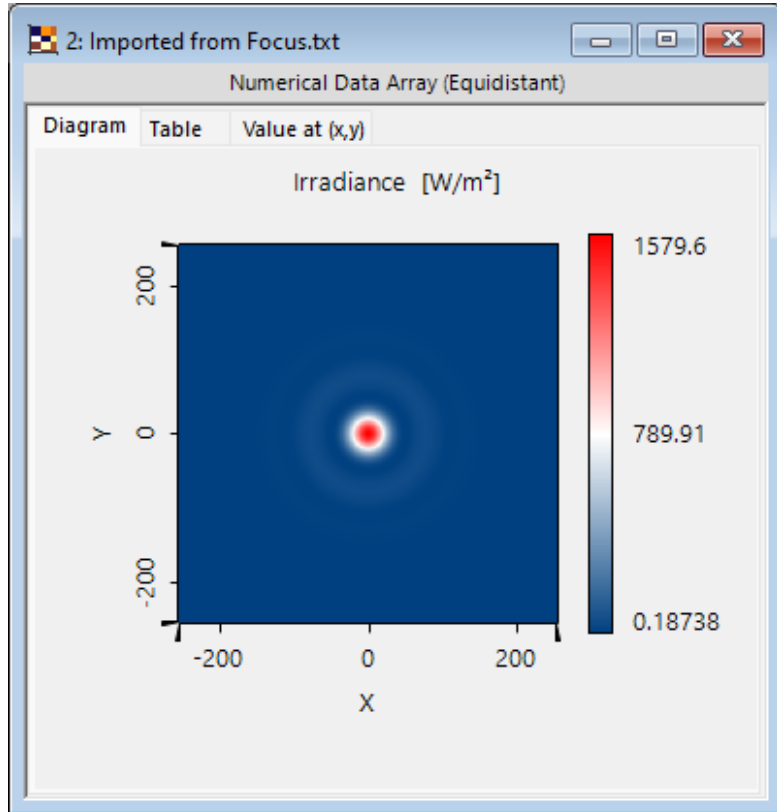
If the data represents non-SI units (e.g. mm) the Factor can be used for conversion (0.01 in the case m to mm)

VirtualLab Fusion offers a wide array of different units for imported data arrays!



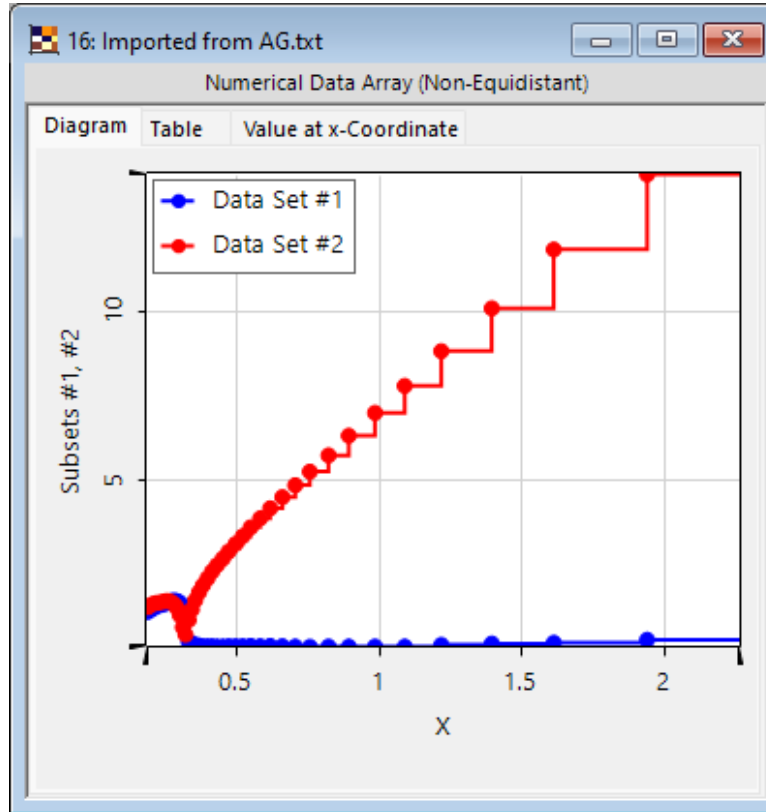
# Examples

focus of an aspheric lens



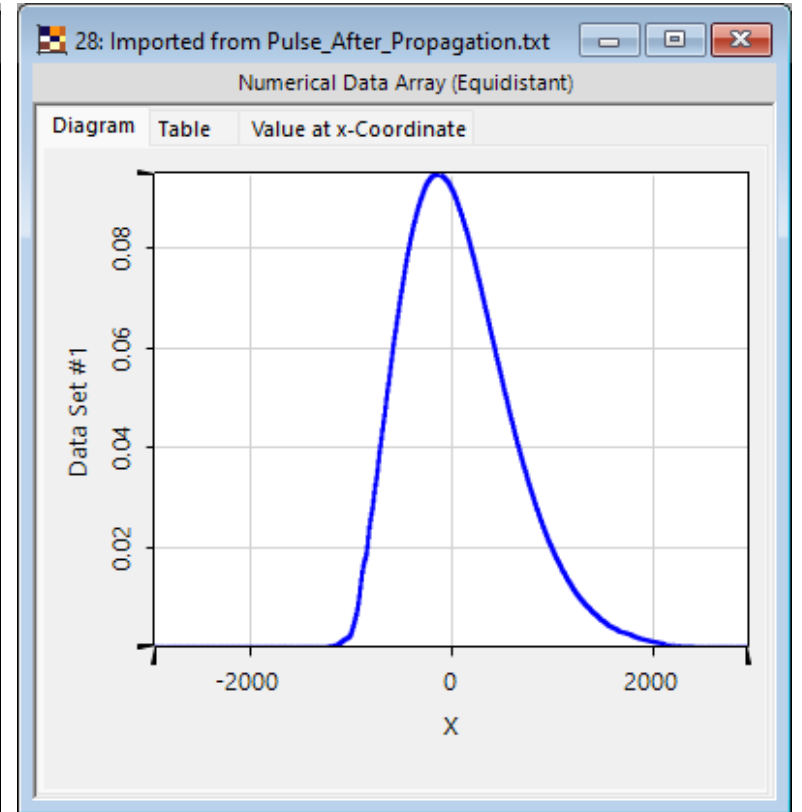
2D, equidistant grid

material data of silver



1D, non-equidistant, multiple subsets

propagated pulse through sea-water



1D, equidistant

# Document Information

title	Import Text Files into VirtualLab Fusion
document code	SWF.0052
document version	1.1
required packages	-
software version	2024.1 (Build 1.132)
category	Feature Use Case
further reading	<ul style="list-style-type: none"><li>- <a href="#">Import of Images</a></li><li>- <a href="#">Import Lens into VirtualLab Fusion</a></li><li>- <a href="#">Import Material Data into VirtualLab Fusion</a></li><li>- <a href="#">Programmable Dispersion Formula</a></li></ul>