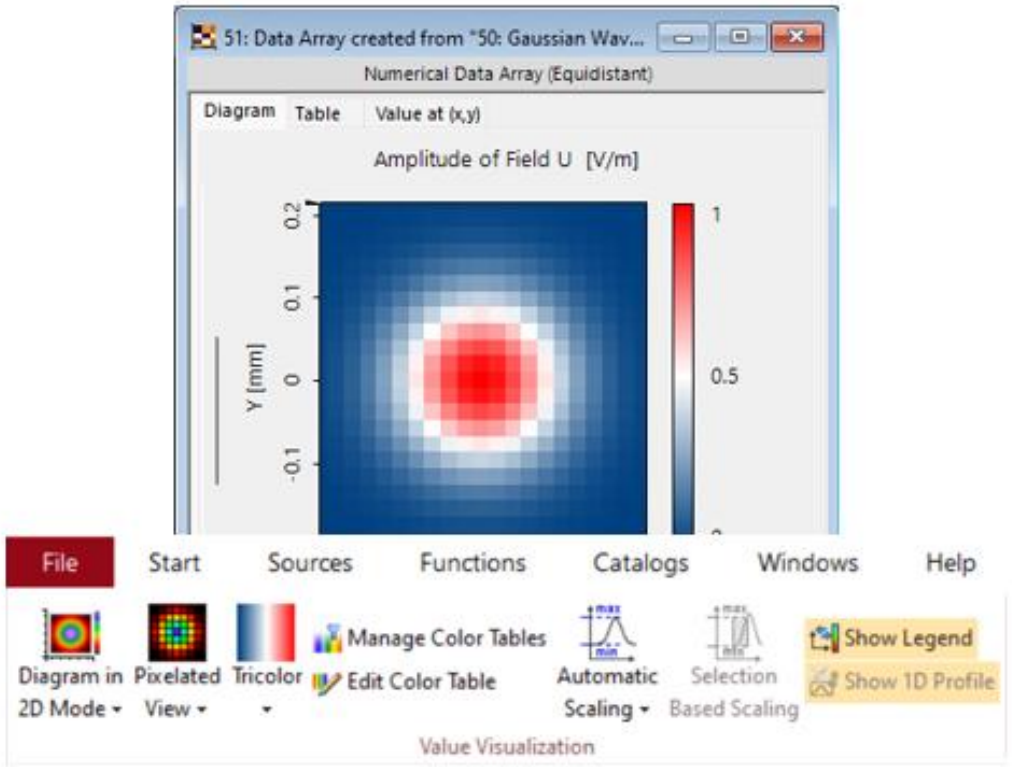
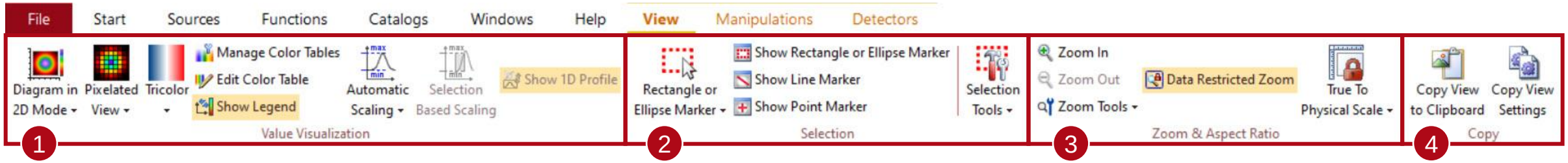
View Settings of 2D Data Arrays

Abstract



Data arrays are the most fundamental type of data in VirtualLab Fusion. As a generic data type, they are among the most flexible documents, offering a wealth of visualization and data manipulation options. As different kinds of data arrays are used in VirtualLab Fusion (e.g., 1D-, 2D-gridded and gridless data arrays), different visualization tools are available. In this document we will take an in-depth look at the visualization options of 2D Data Arrays and go through the corresponding View ribbon options in detail.

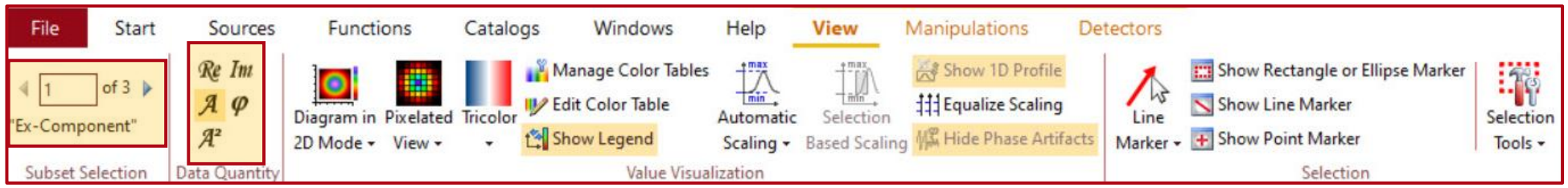
Visualization Tools

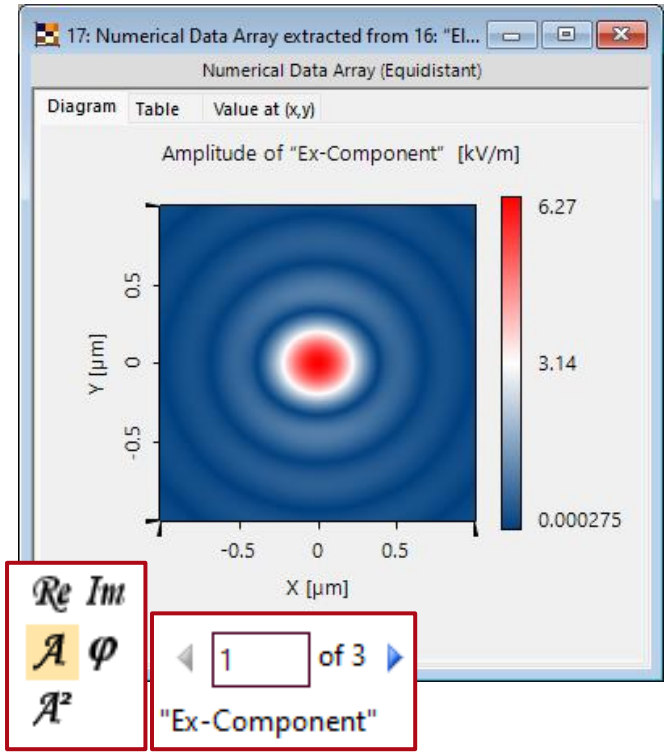


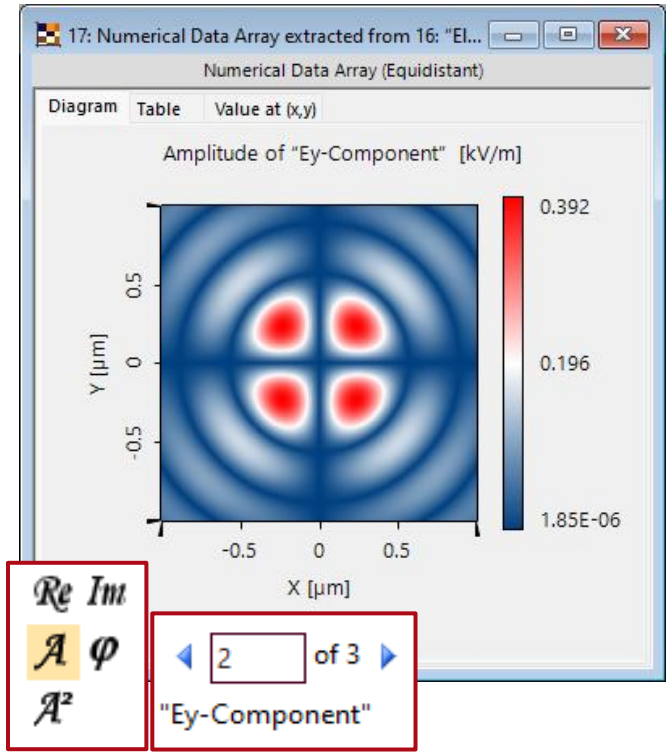
The *View* tab of the main menu allows for various adjustments regarding the visual style of the *Data Array*, including:

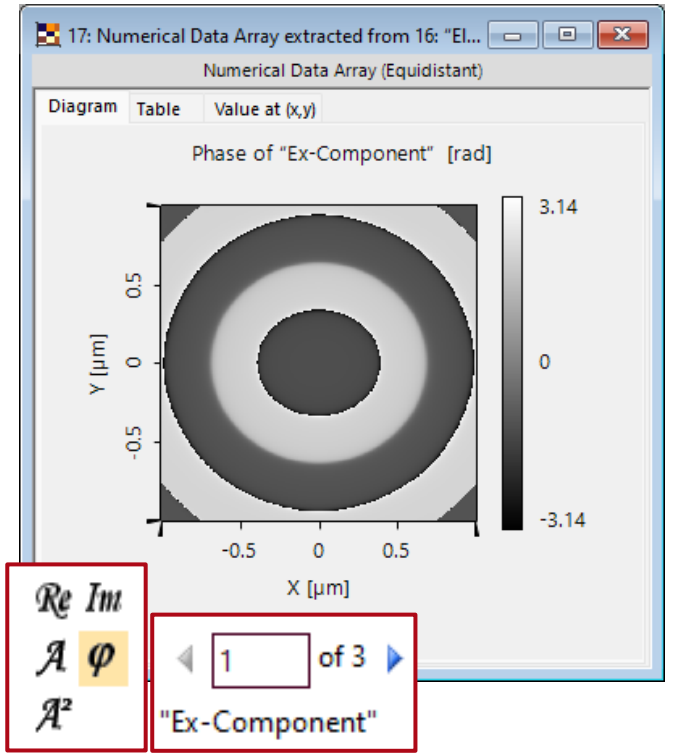
1. *Value Visualization*: Determine the *Color Table* of the *Data Array* as well as various scaling options.
2. *Selection*: This region contains the options regarding the markers and various tools to quickly find certain regions.
3. *Zoom & Aspect Ratio*: In this region the user finds buttons to zoom into (and out of) the data.
4. *Copy*: Allows the user to quickly copy view settings from one *Data Array* to another.

Subset & Data Quantity Selection (For Complex/Mult. Subsets)



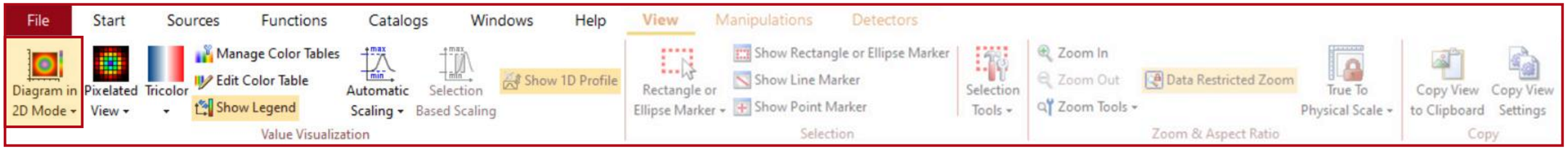


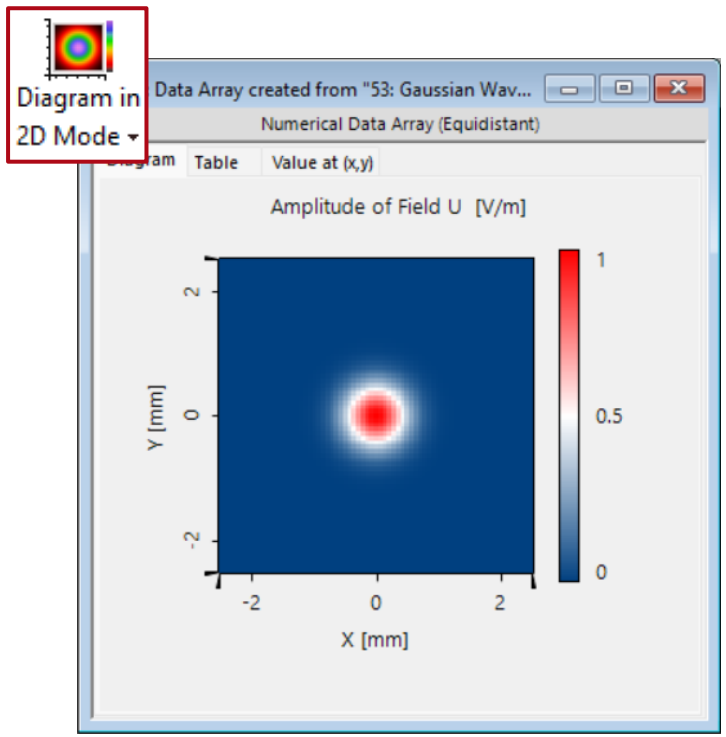


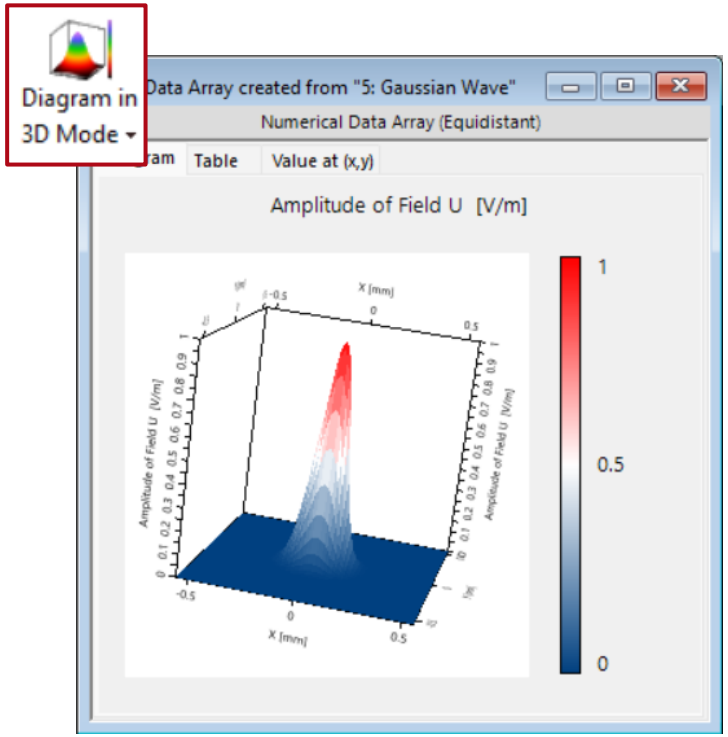


If an active *Data Array* comprises multiple subsets (wavelength modes, field components,…), a new section appears in the *View* tab that allows you to switch through the individual subsets (*Subset Selection*). A similar section appears if the data is complex valued (*Data Quantity*).

2D & 3D Mode



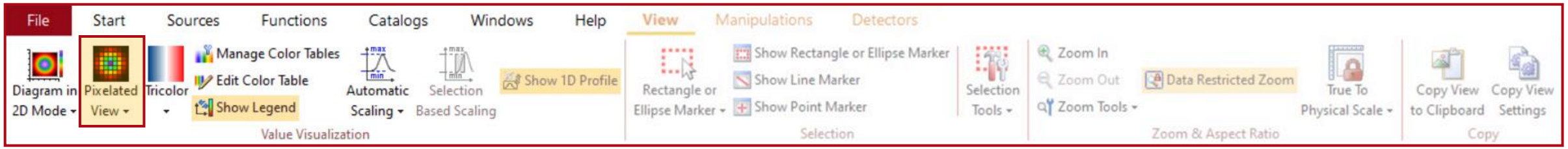


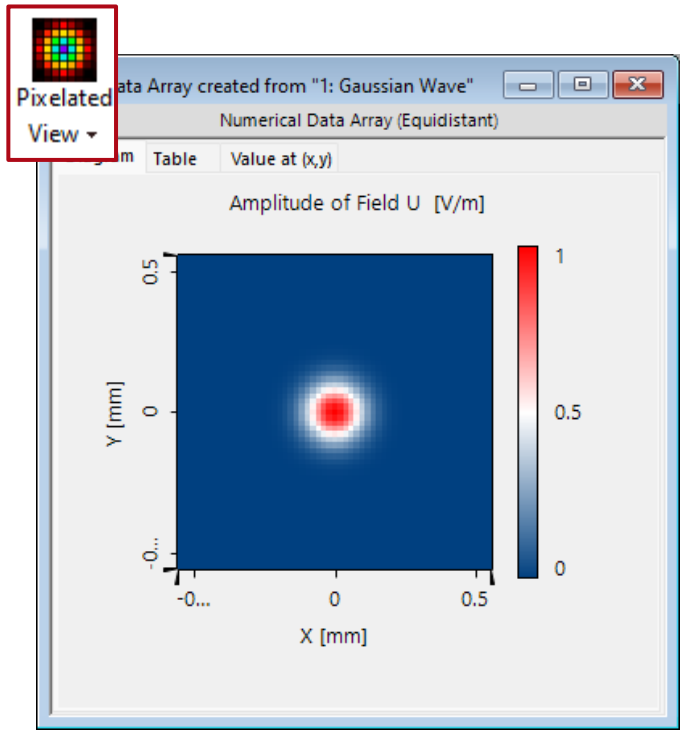


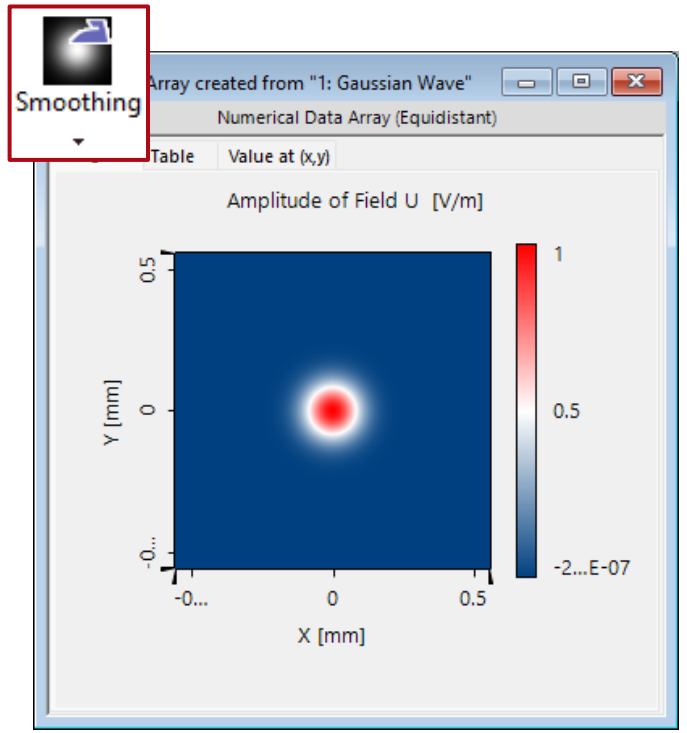
With this tool, users can visualize the results in 3D. In 3D mode:

- left-click and hold to rotate the view.
- left-click while pressing on the X/Y/Z-key to rotate around a specific axis.
- Shift key and left-click to shift the view laterally.

Smoothing & Interpolation

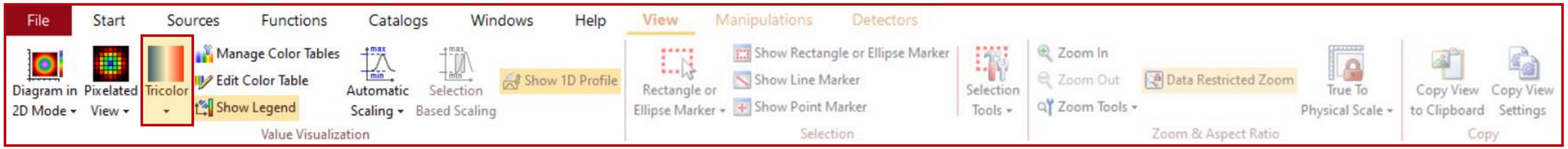


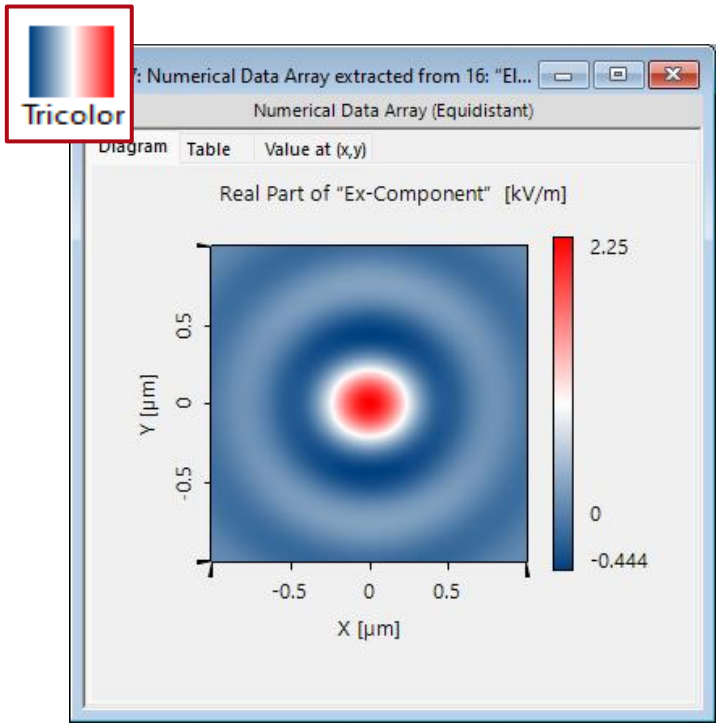


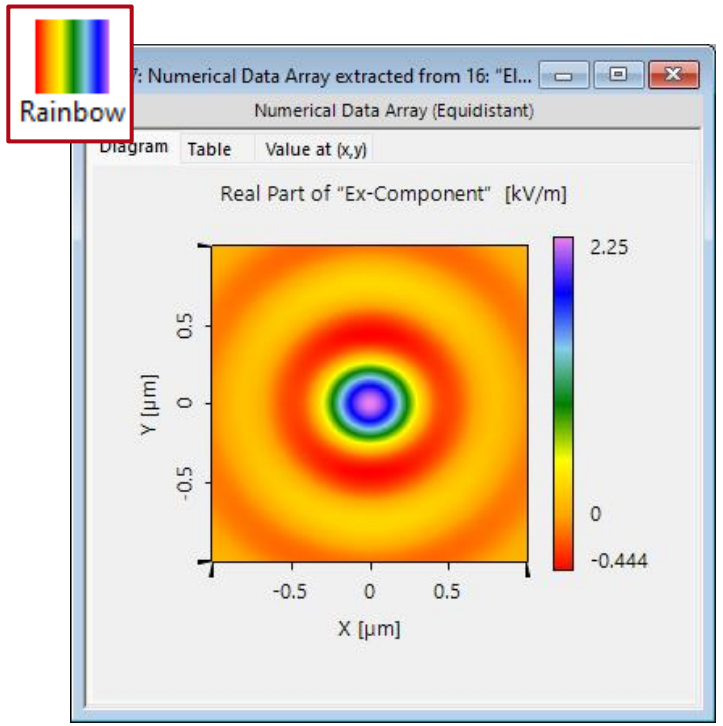


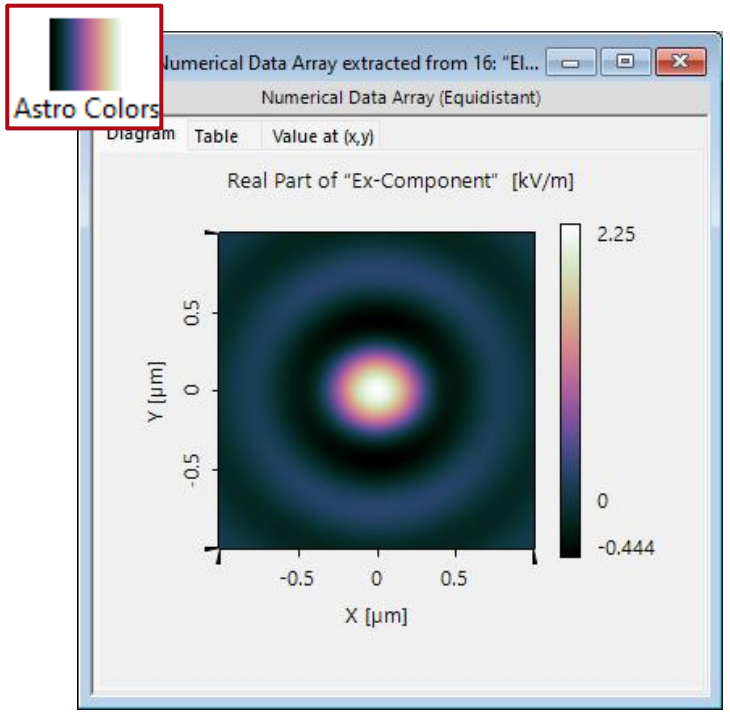
Data Arrays can be displayed with and without smoothing by clicking on the *Pixelated View* button. Please note that this button only applies a certain interpolation algorithm onto the document, but it does not alter the data. The applied interpolation technique can be modified in the *Manipulation* ribbon.

Color Scheme

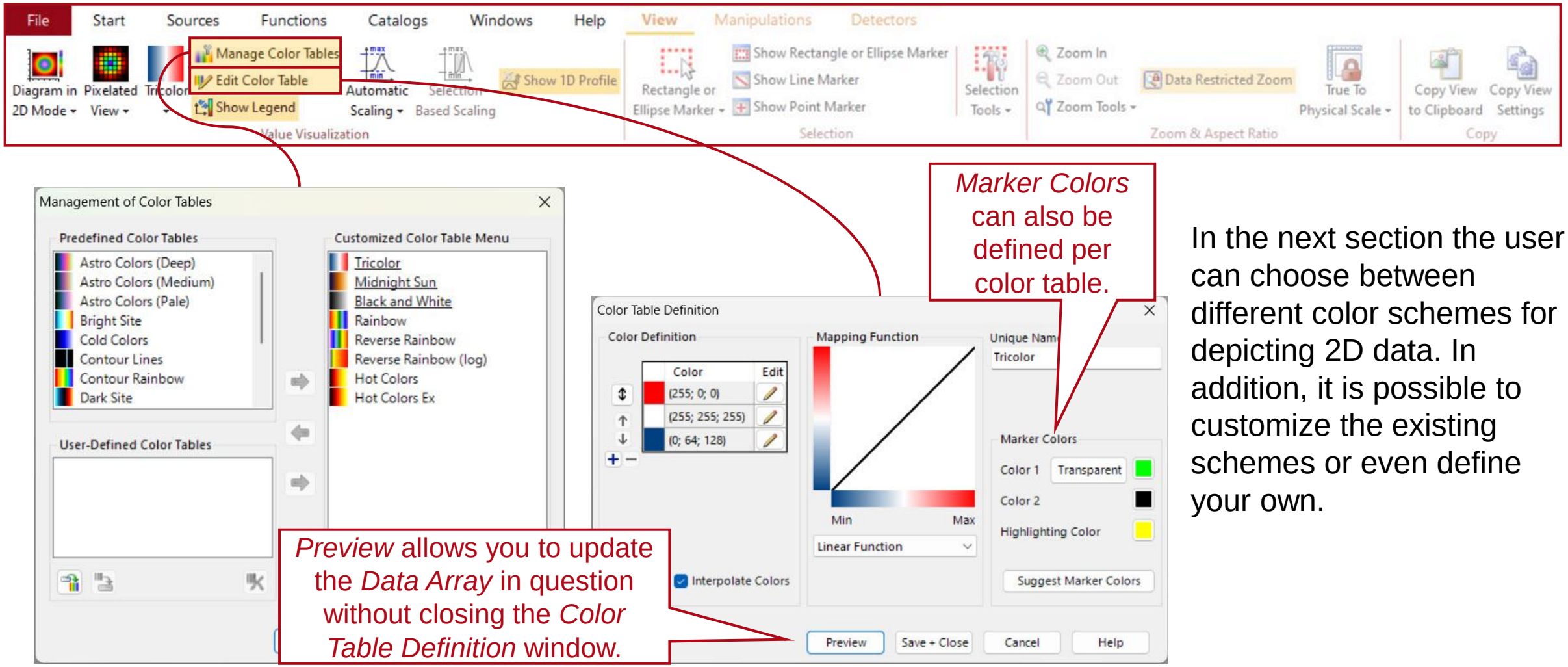








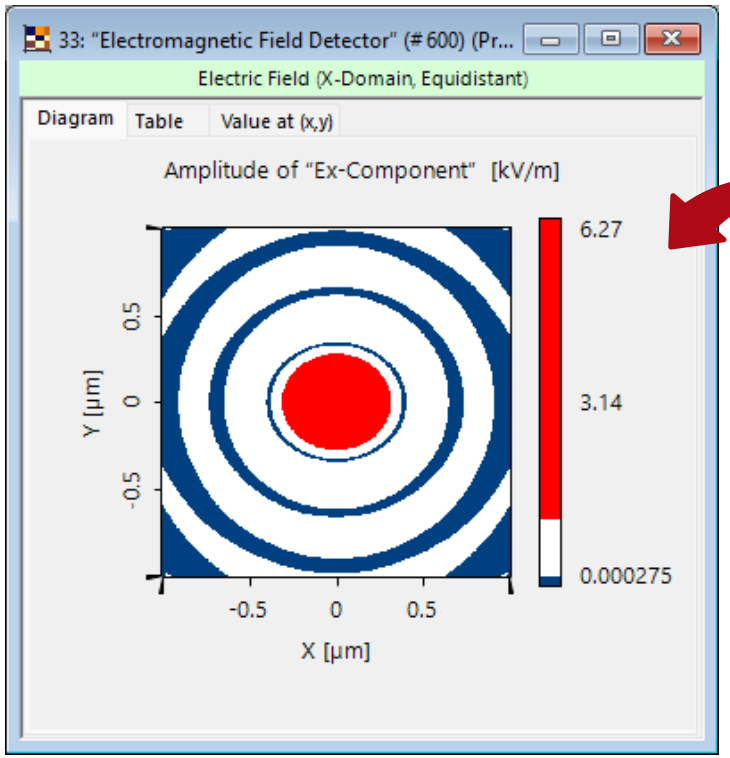
Manage & Edit Color Schemes

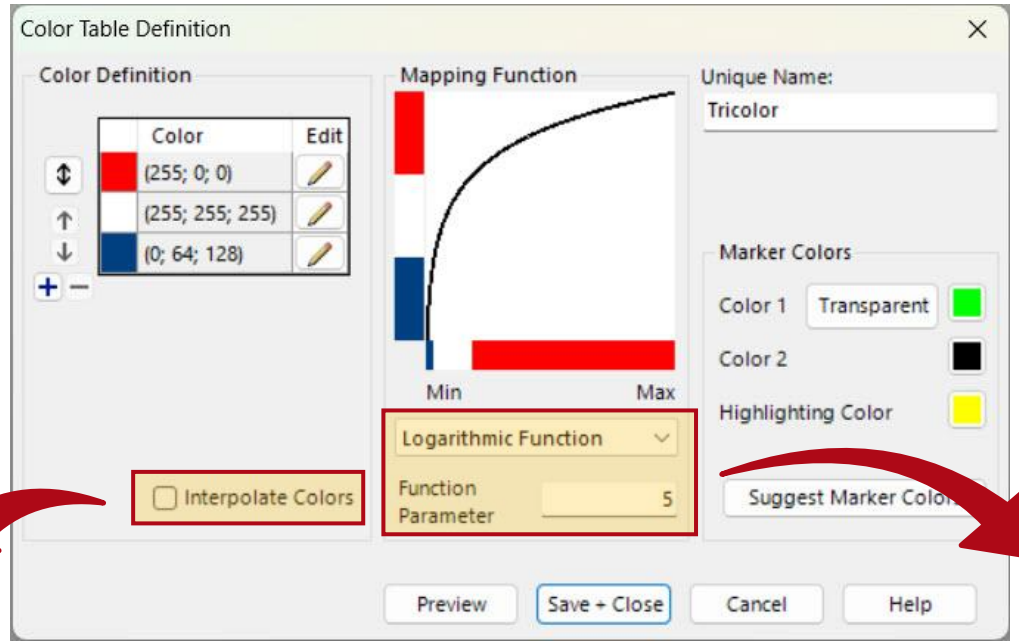


In the next section the user can choose between different color schemes for depicting 2D data. In addition, it is possible to customize the existing schemes or even define your own.

Logarithmic & Exponential Color Tables

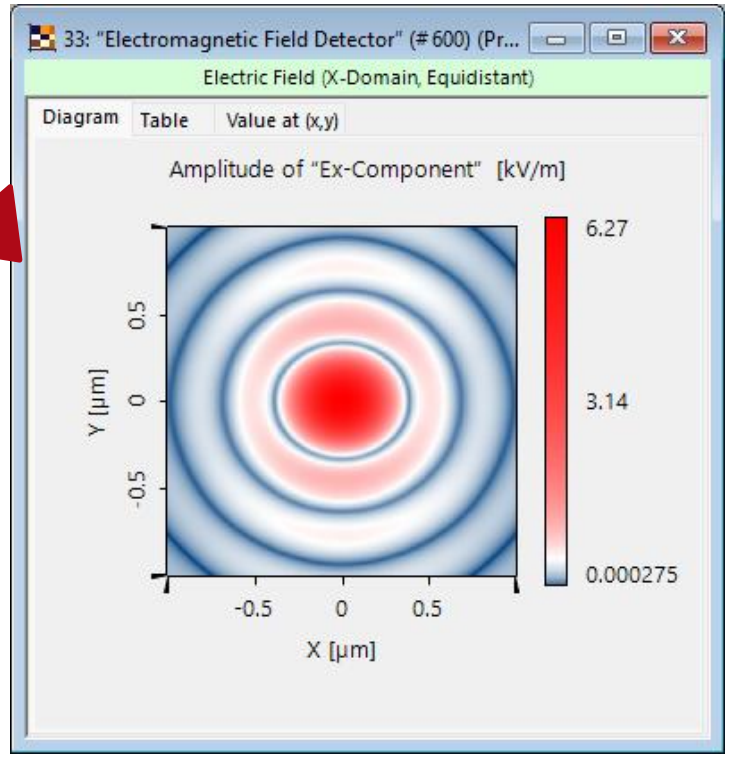
logarithmic, without interpolation



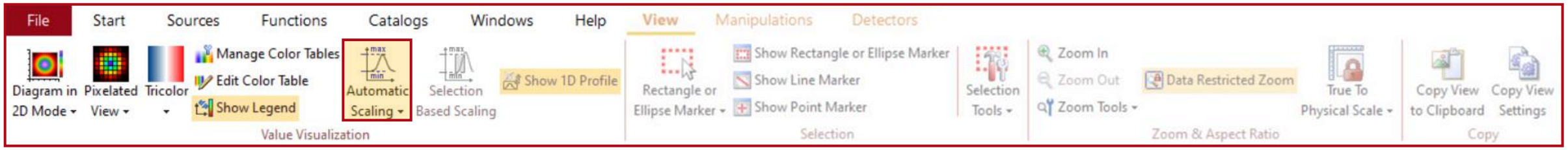


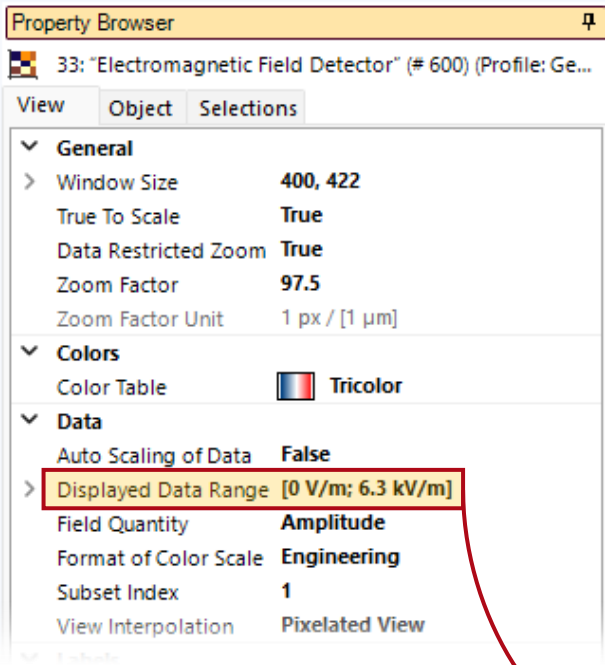
In case multiple orders of magnitude are of interest, logarithmic or exponential functions can be utilized in the color scheme of any color table. For a better visualization of contours, it is also possible to disable the interpolation between the defined colors.

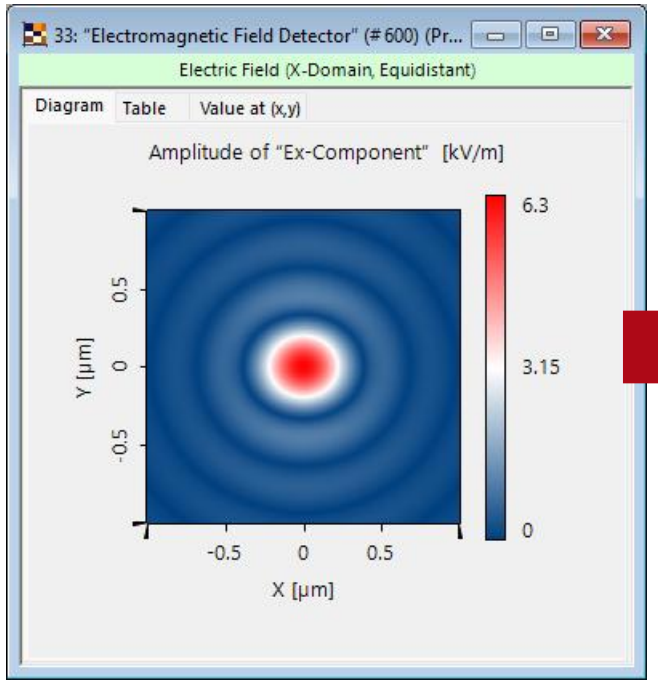
logarithmic

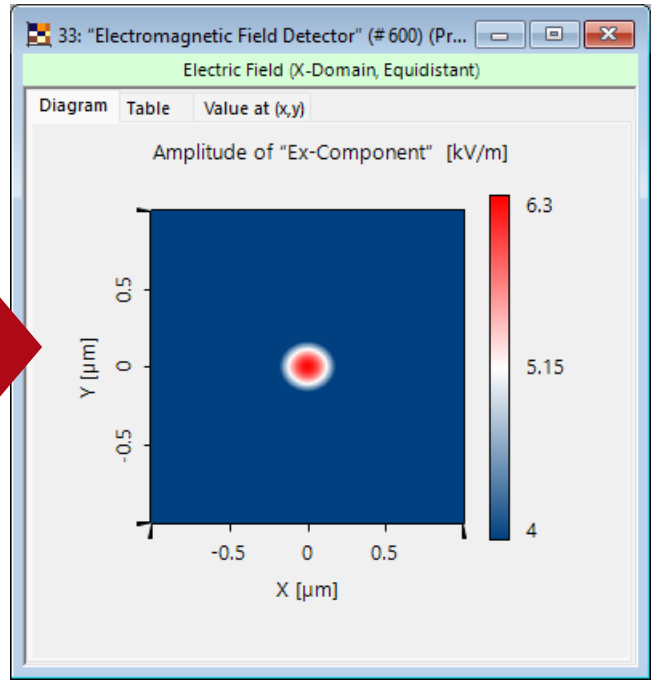


Scaling







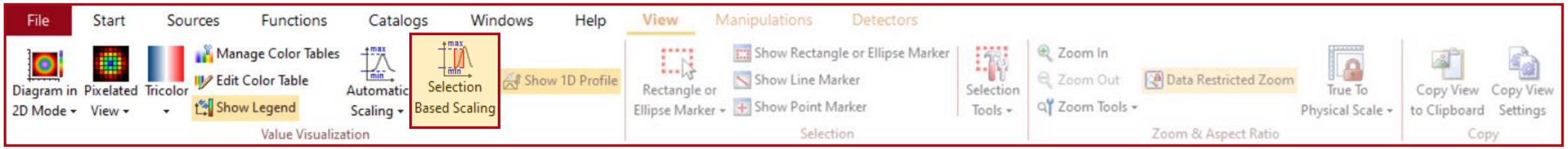


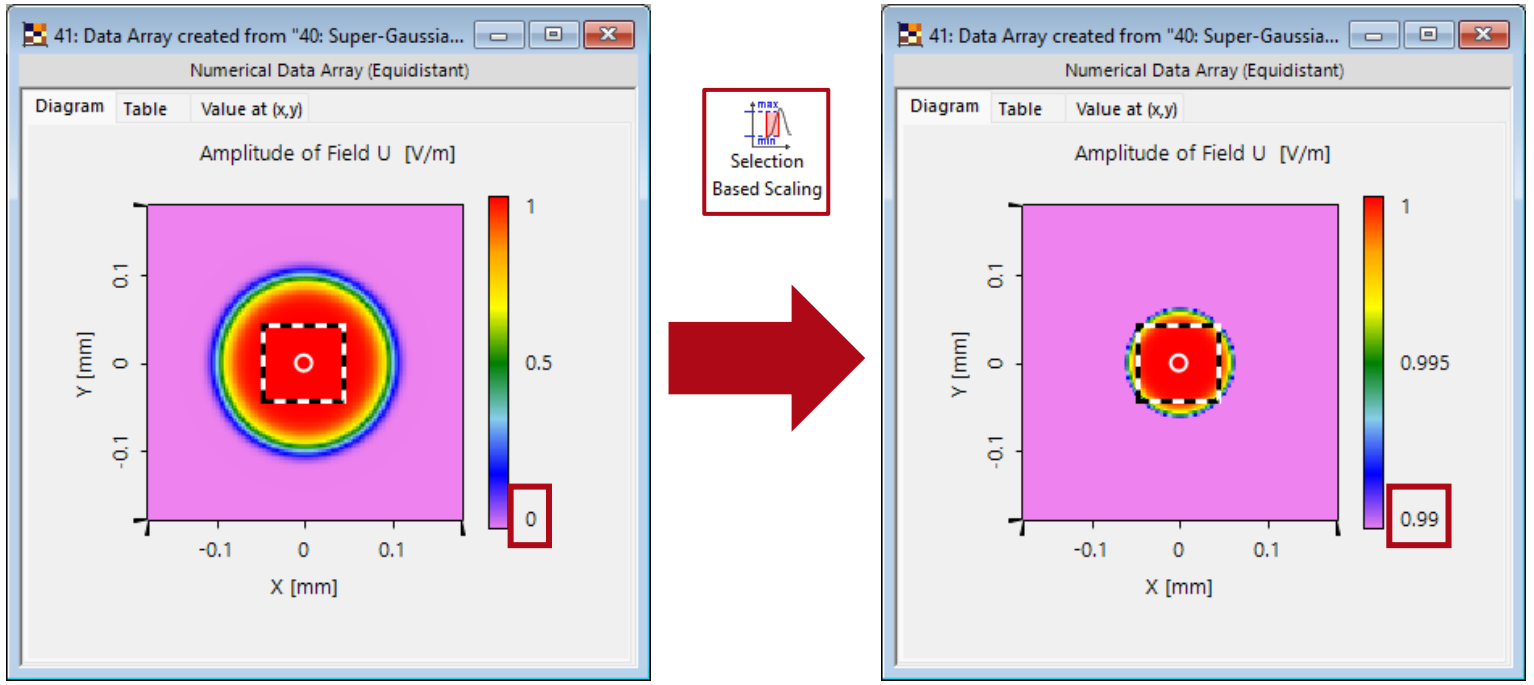
Displayed Data Range **[0 V/m; 6.3 kV/m]**

Displayed Data Range **[4 kV/m; 6.3 kV/m]**

By default, the shown data range will be determined automatically by the min. and max. value. With the *User-Defined Scaling* setting, the user can modify the displayed data range in the *Property Browser*.

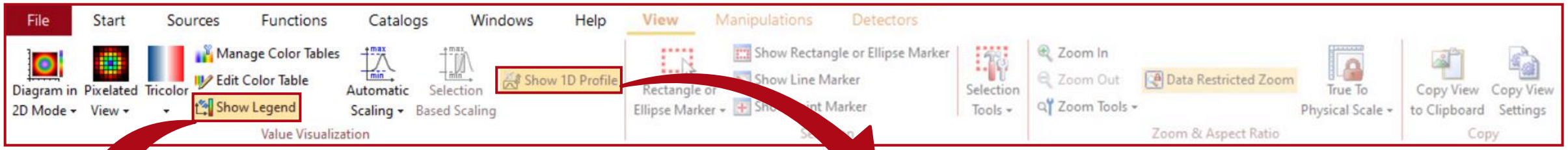
Selection Based Scaling Tool

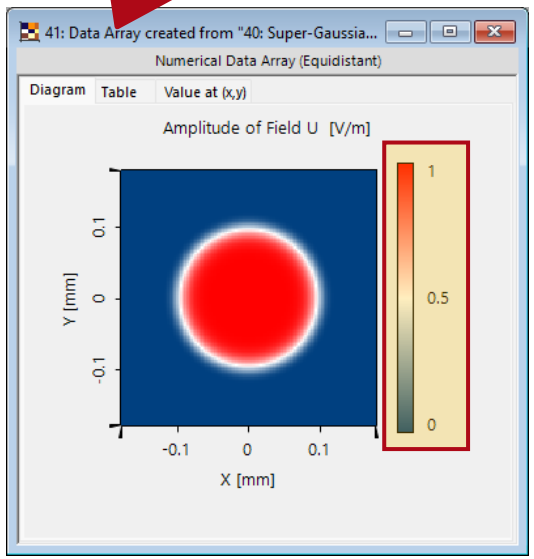


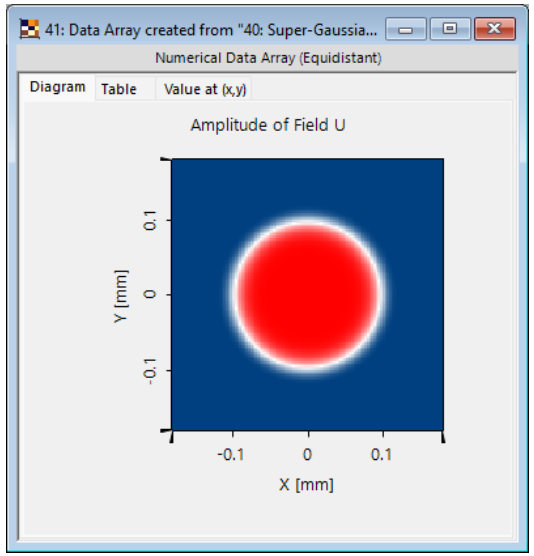


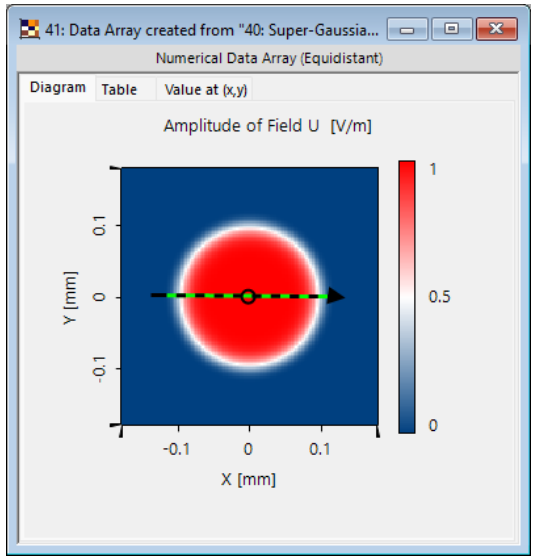
If parts of the data are selected by a *Rectangle or Ellipse Marker*, the *Selection Based Scaling* option can be used to change the scaling according to the minimum and maximum value within the selection.

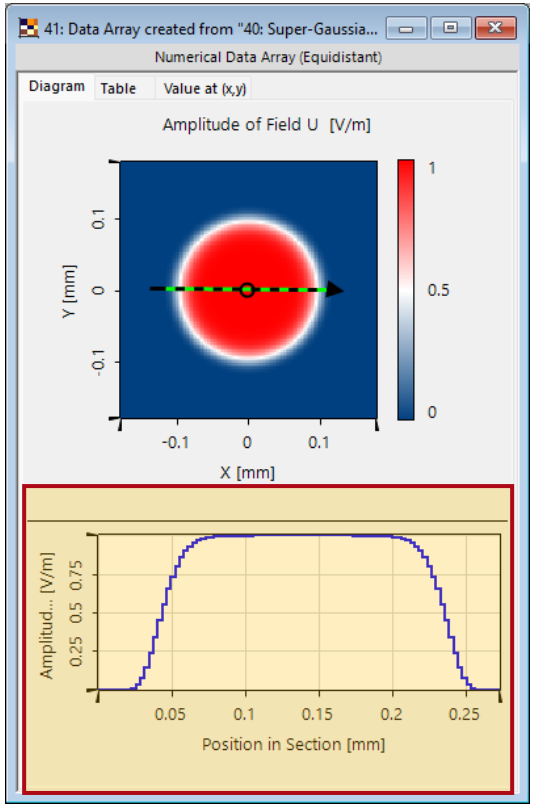
Legend & 1D Profile





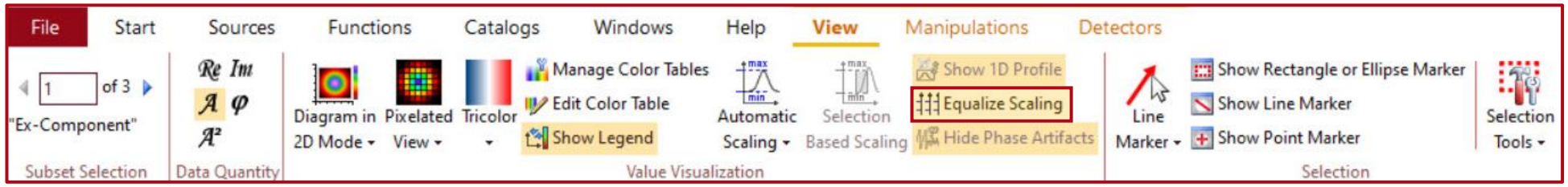


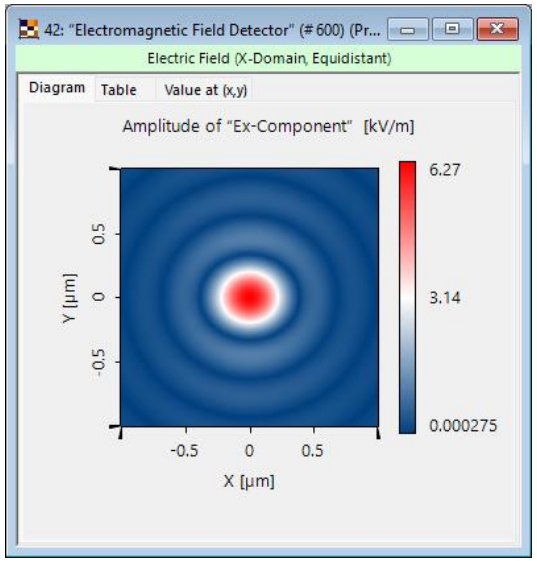


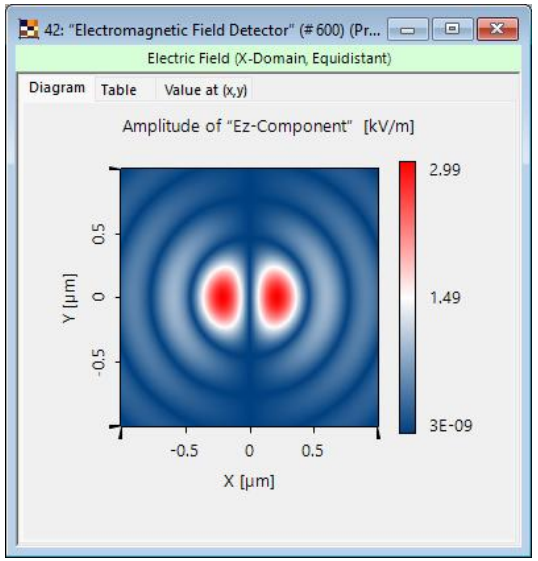


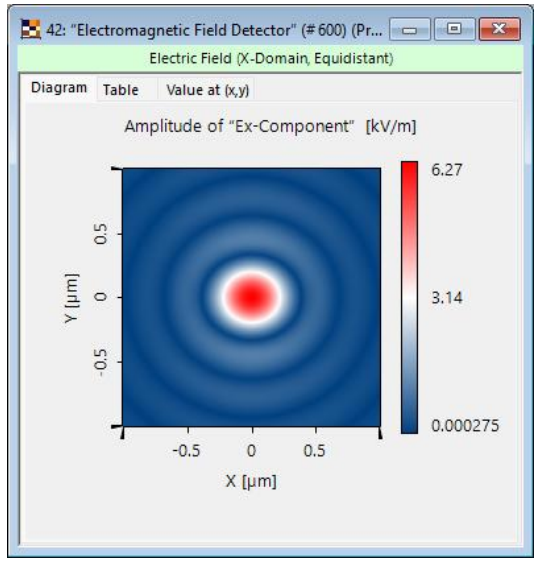
Additional GUI features, such as display of the legend and 1D profile along a line marker can be switched on or off.

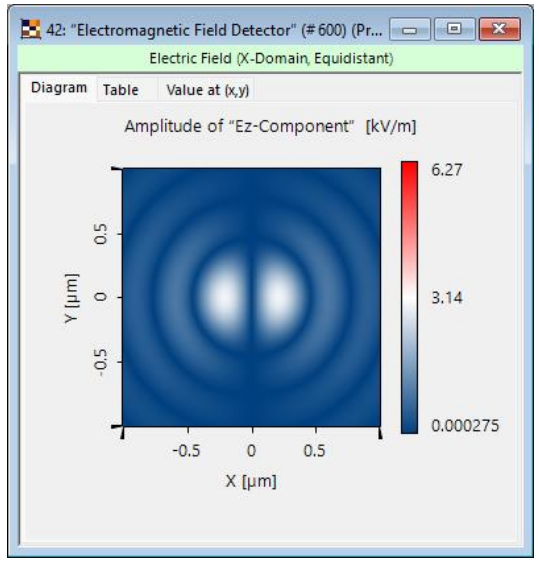
Equalize Scaling (For Multiple Subsets)





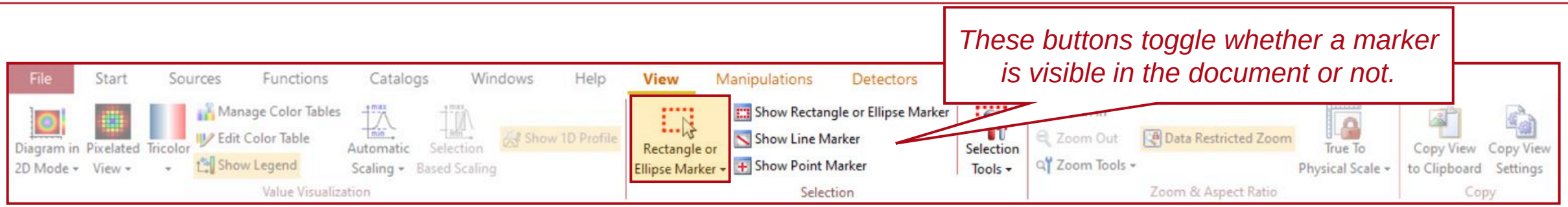


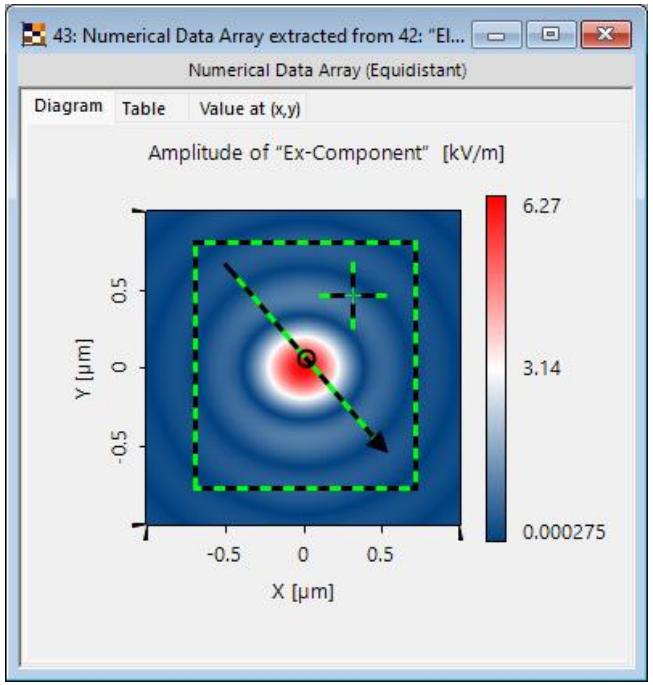




By default, if the *Data Array* contains multiple subsets, the scaling will be determined for each subset individually. The *Equalize Scaling* option automatically adjust the scaling of all subsets according to the current one.

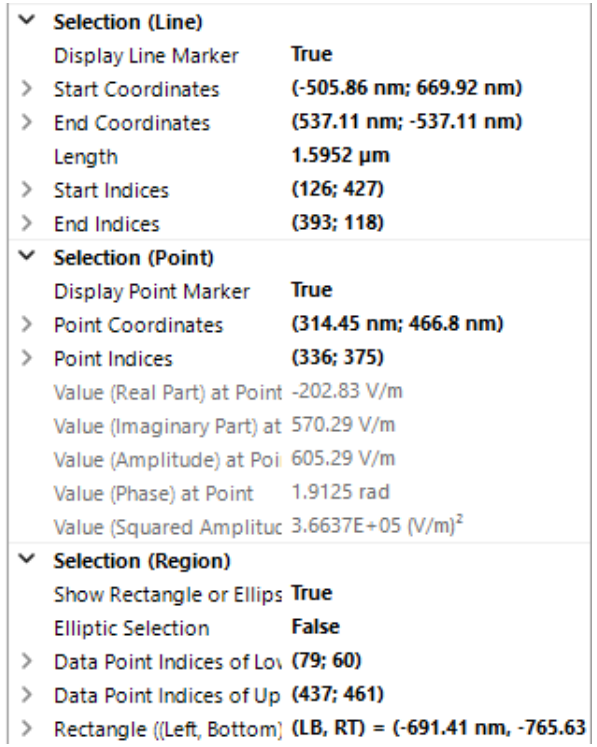
Markers – Selection of Data



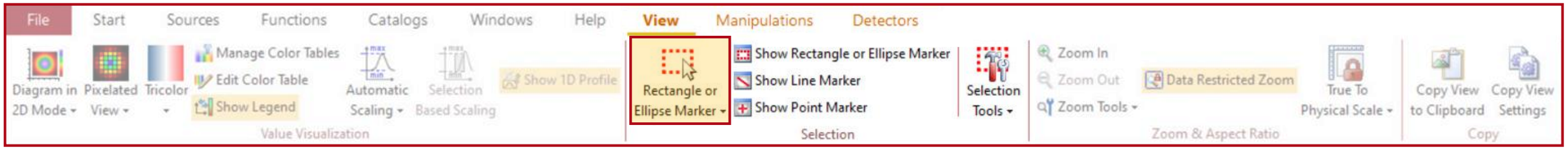


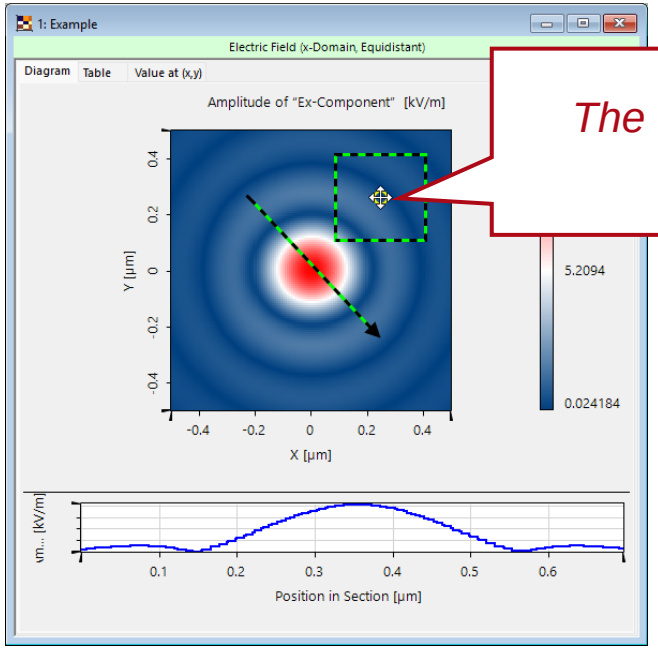
VirtualLab Fusion offers three different selection tools, such as selecting a specific point, line or region within the *Data Array*. Some tools in the *View* and *Manipulations* tabs require an active marker to be available.

Detailed information about the markers and coordinates can be found and adjusted in the *Property Browser*!

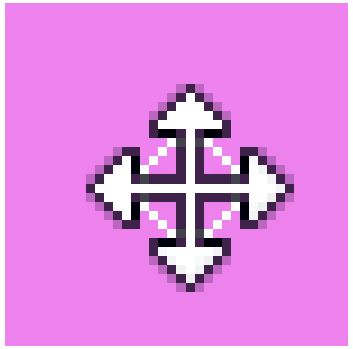


Markers – Selection of Data

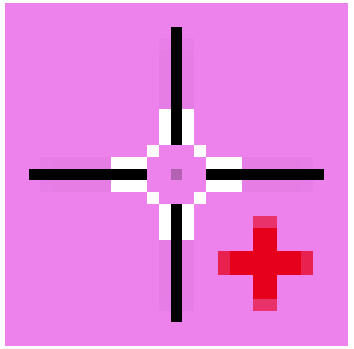




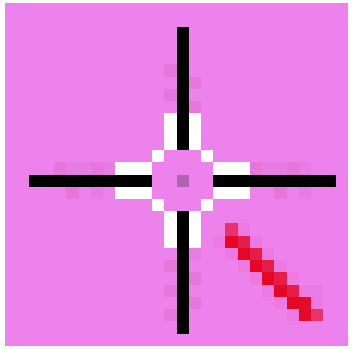
The cursor will automatically adjust to represent possible actions.



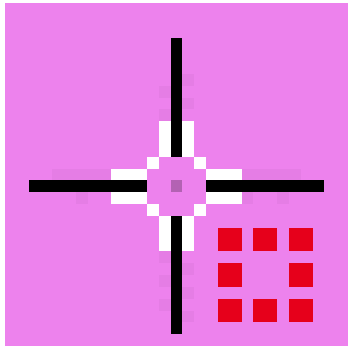
Move marker



Set point marker

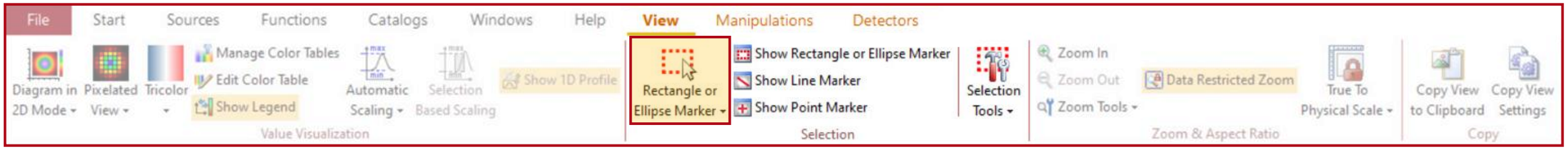


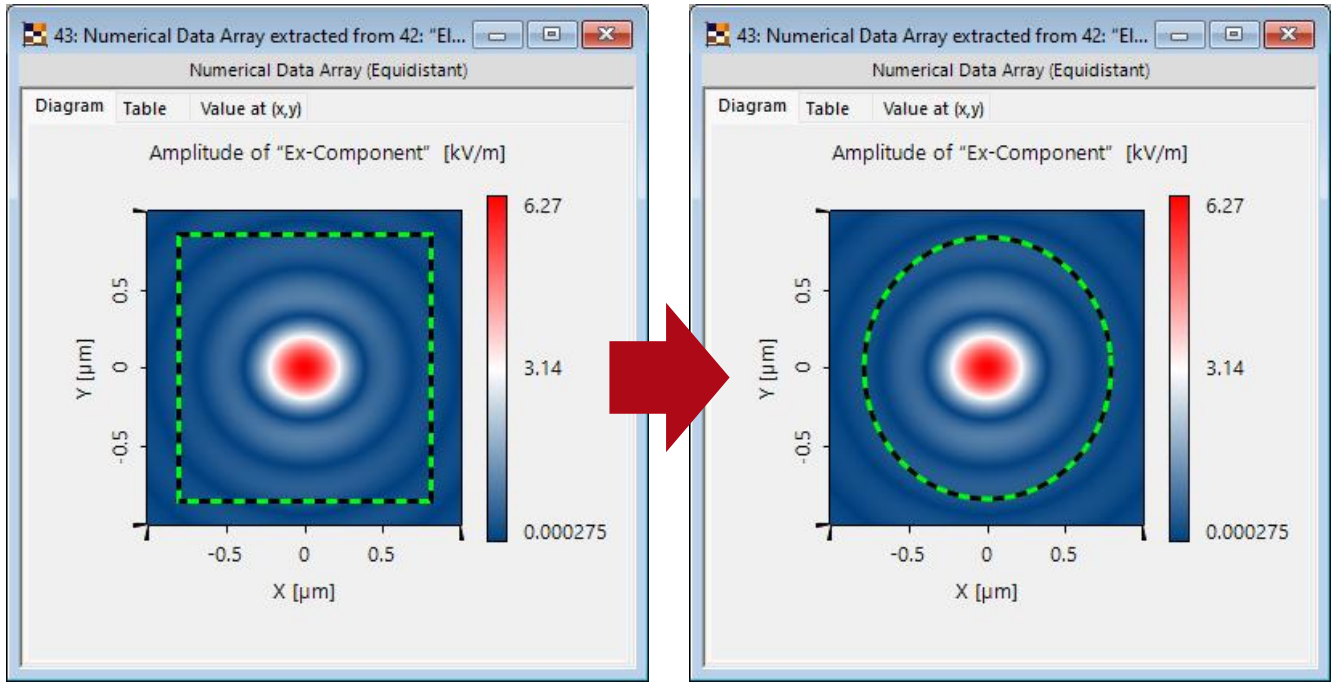
Set line marker

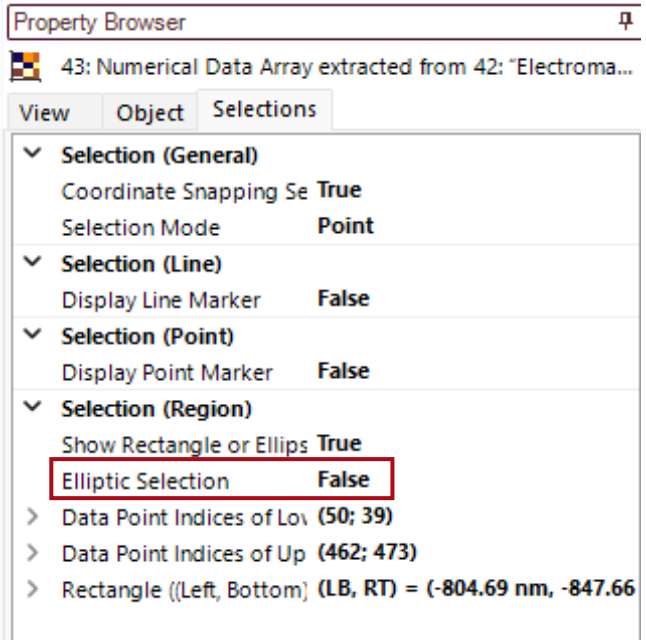


Set rectangle marker

Rectangle and Ellipse Marker







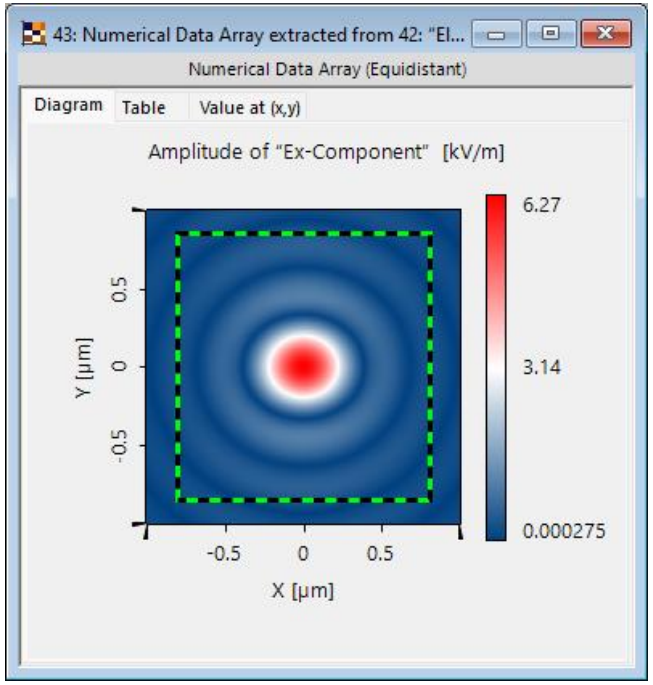
The selection of a region can be switched from rectangular to elliptic in the *Property Browser*.

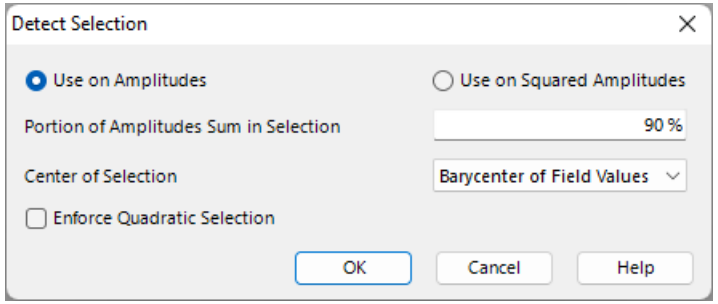
Rectangle and Ellipse Marker

In addition, for *Rectangle or Ellipse Marker* there is a selection of tools available to quickly detect a specific region or move an already existing marker.

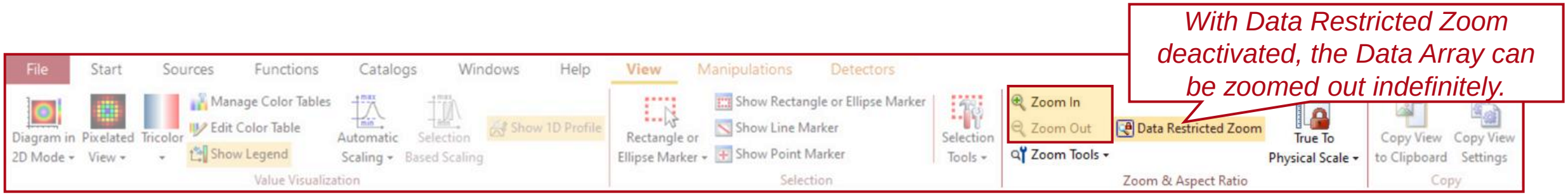
The available tools are:

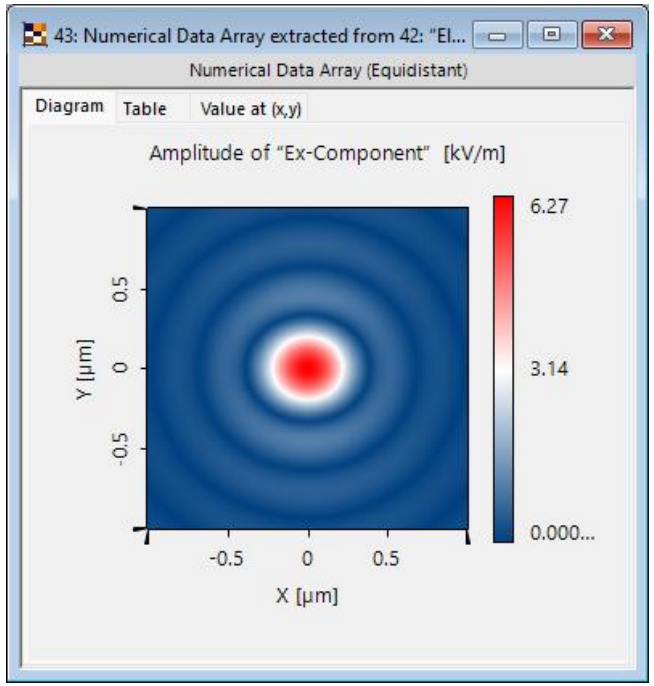
- select the entire window
- select region that corresponds to a pre-defined portion of the amplitude sum or squared amplitude sum
- move marker to origin
- copy marker from another window



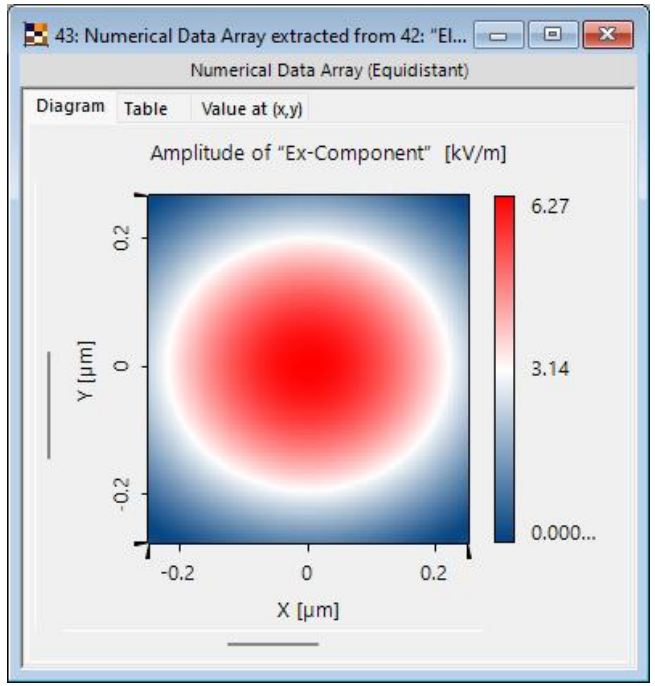


Zoom Options

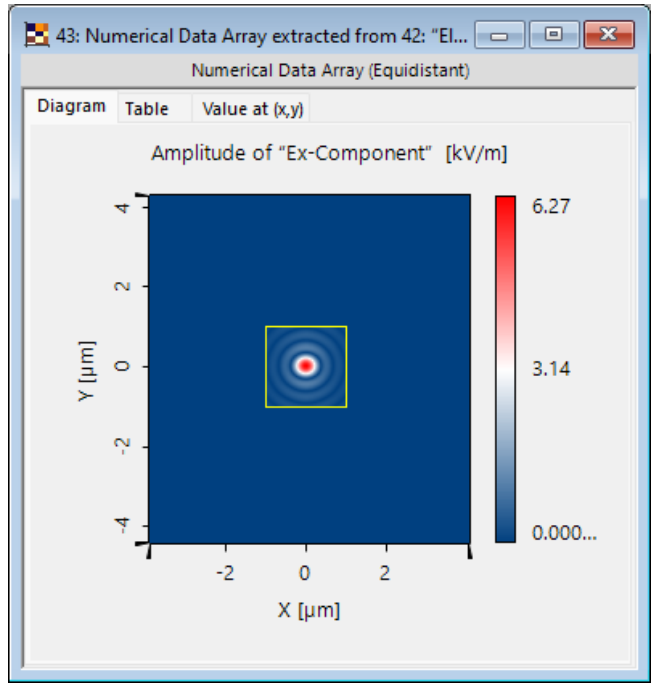




original window

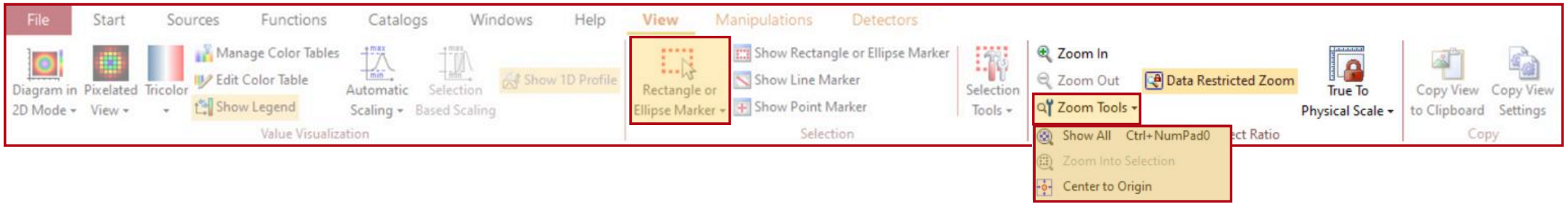


zoomed in



zoomed out

Zoom Tools


File
Start
Sources
Functions
Catalogs
Windows
Help
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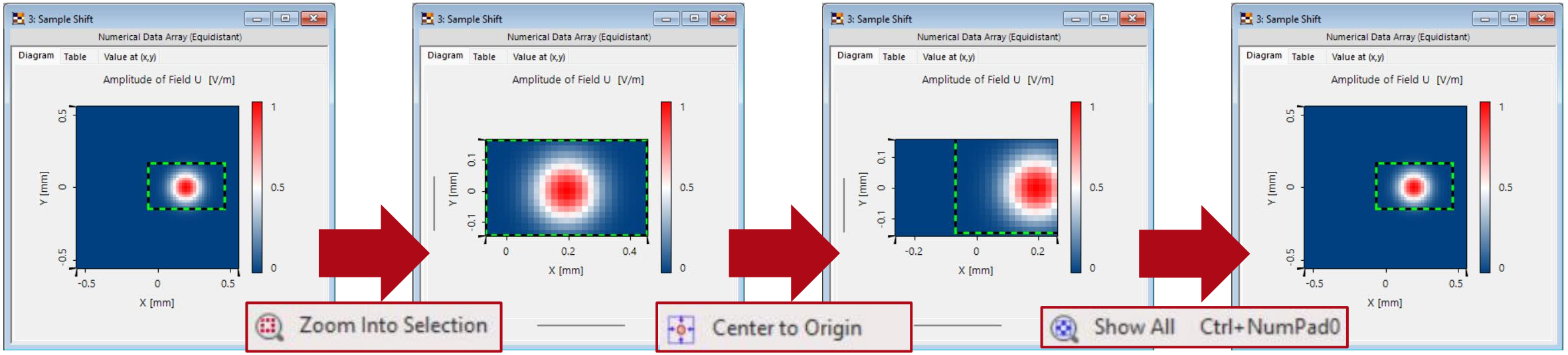
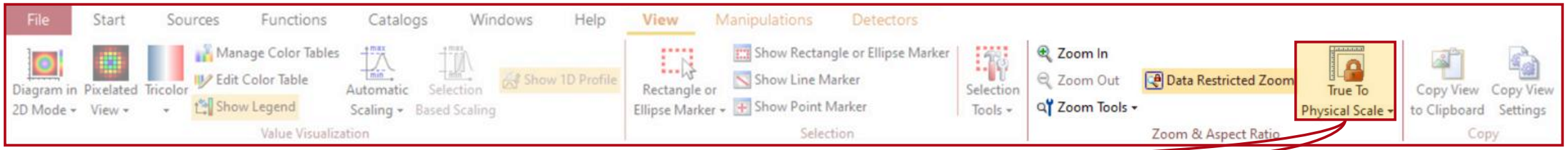
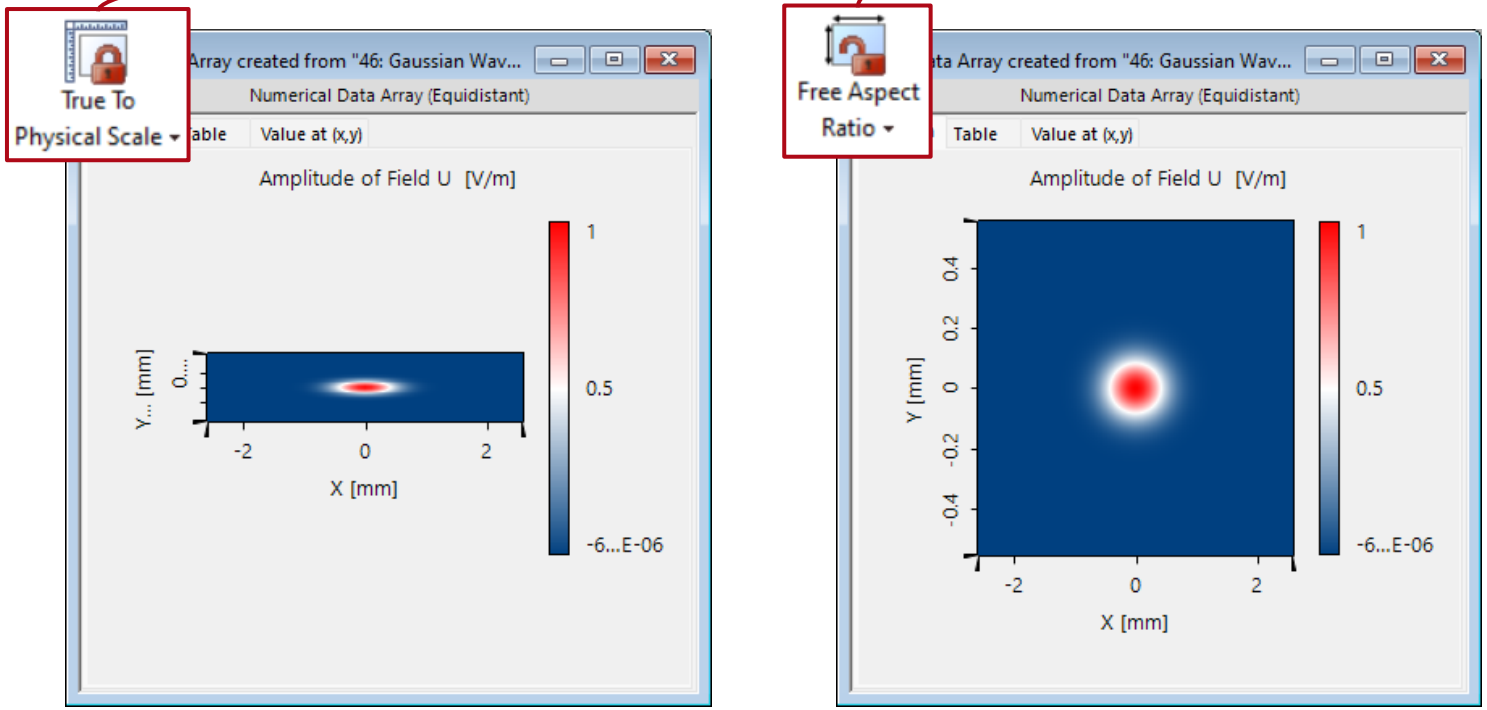
Manipulations
Detectors
Diagram in 2D Mode
Pixelated View
Tricolor
Manage Color Tables
Edit Color Table
Show Legend
Automatic Scaling
Selection Based Scaling
Show 1D Profile
Value Visualization
Rectangle or Ellipse Marker
Show Rectangle or Ellipse Marker
Show Line Marker
Show Point Marker
Selection
Selection Tools
Zoom In
Zoom Out
Data Restricted Zoom
Zoom Tools
Show All Ctrl+NumPad0
Zoom Into Selection
Center to Origin
True To Physical Scale
Copy View to Clipboard
Copy View Settings
Copy


3: Sample Shift
Numerical Data Array (Equidistant)
Diagram
Table
Value at (x,y)
Amplitude of Field U [V/m]
Y [mm]
X [mm]
Zoom Into Selection
Center to Origin
Show All Ctrl+NumPad0

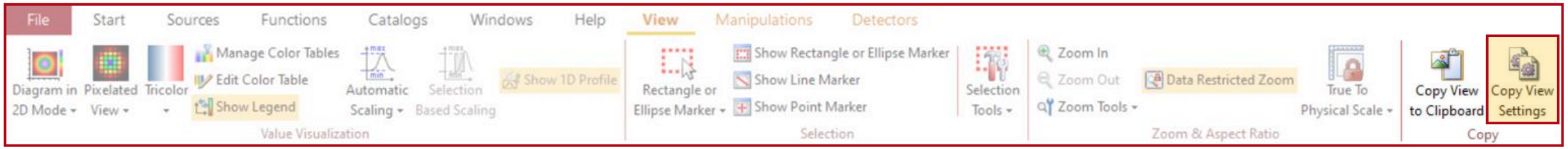
Lateral Scaling

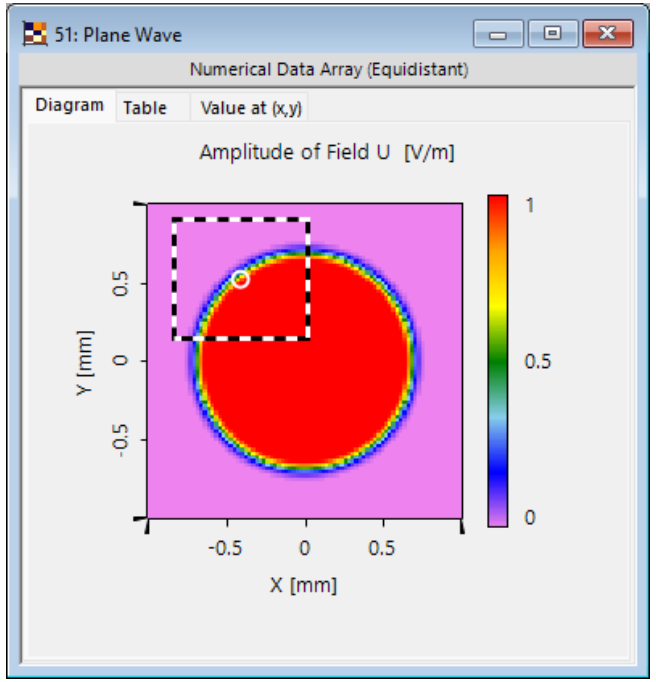


By default, *Data Arrays* are visualized with the same scaling on both axis, meaning that i.e., 1 mm on the x-axis has the same length as 1 mm on the y-axis. This can be changed by selecting *Free Aspect Ratio* in the *View* tab.

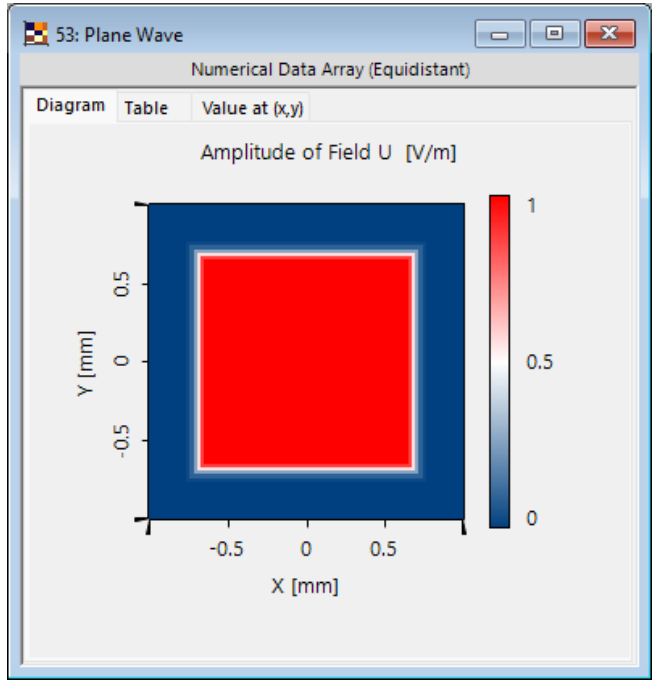


Copy View Settings

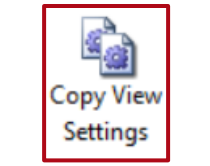


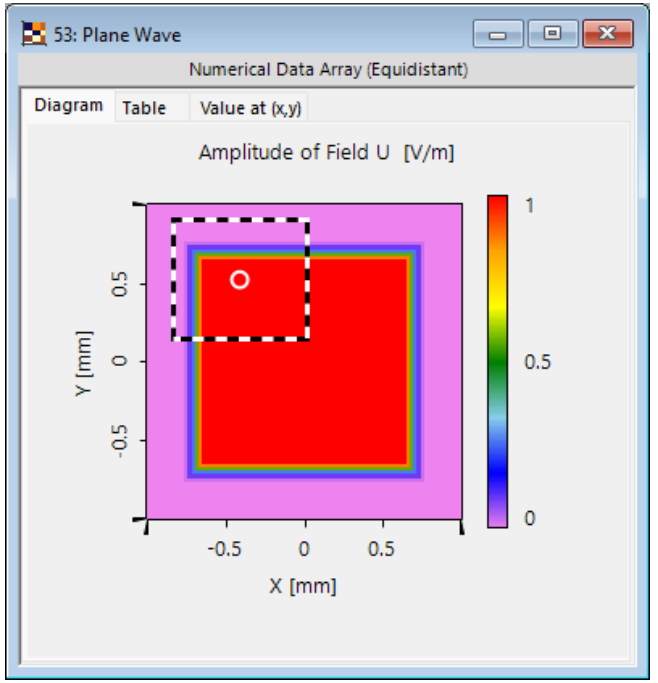


reference



before copying





after copying

Document Information

Title	View Settings of 2D Data Array
Document code	TUT.0338
Publication date	08.07.2025
Required packages	-
Software version	-
Category	Tutorial
Further reading	• Introduction to Data Arrays • General Manipulation Tools for Data Arrays