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# Introducing MagicPlot 2.10 [NOT RELEASED YET]

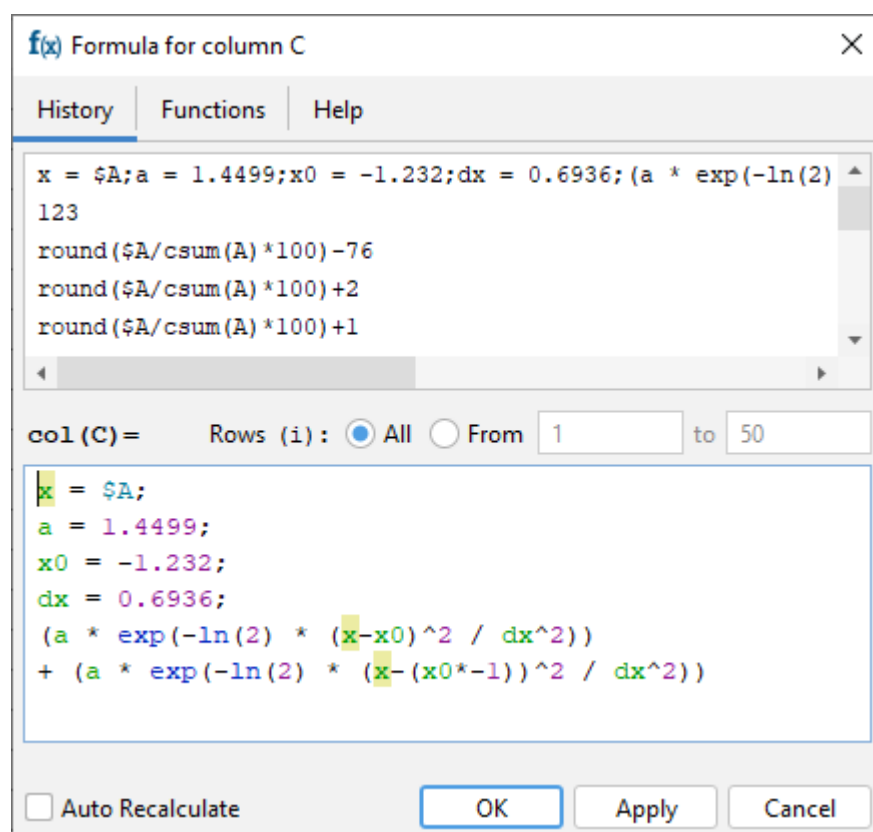
To be released in fall 2020.

**This is a draft document. The features described are subject to change.**

## Setting Variables in Formulas

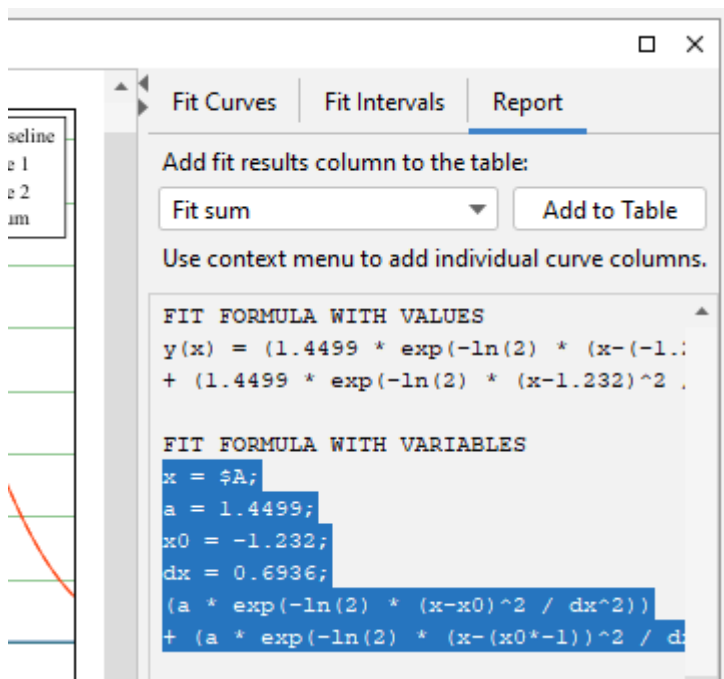
In MagicPlot 2.10 you can set variables in formulas: write an assignment and a semicolon to separate it from the next part of the formula, for example: `a=5; a*a + 2*a + 1`. The last expression (after the last semicolon) is the result of the formula and cannot contain an assignment. MagicPlot highlights all usages of the variable at cursor in the edited formula.

The variables can be used in Column Formula, Custom Fit Curve equation and in any other formula fields in MagicPlot.



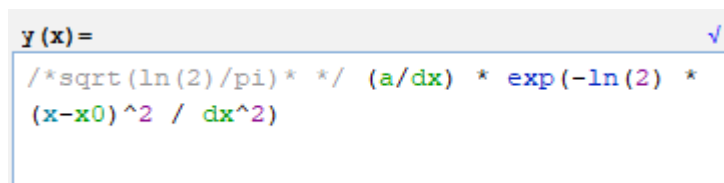
## Tip: Inserting Fit Equation to the Column Formula

You can copy the fit equation with variables from the Report tab of a Fit Plot and paste it in any formula field including Column Formula:



## Comments in Formula

You can insert comments in any formula using `/*...*/` notation:

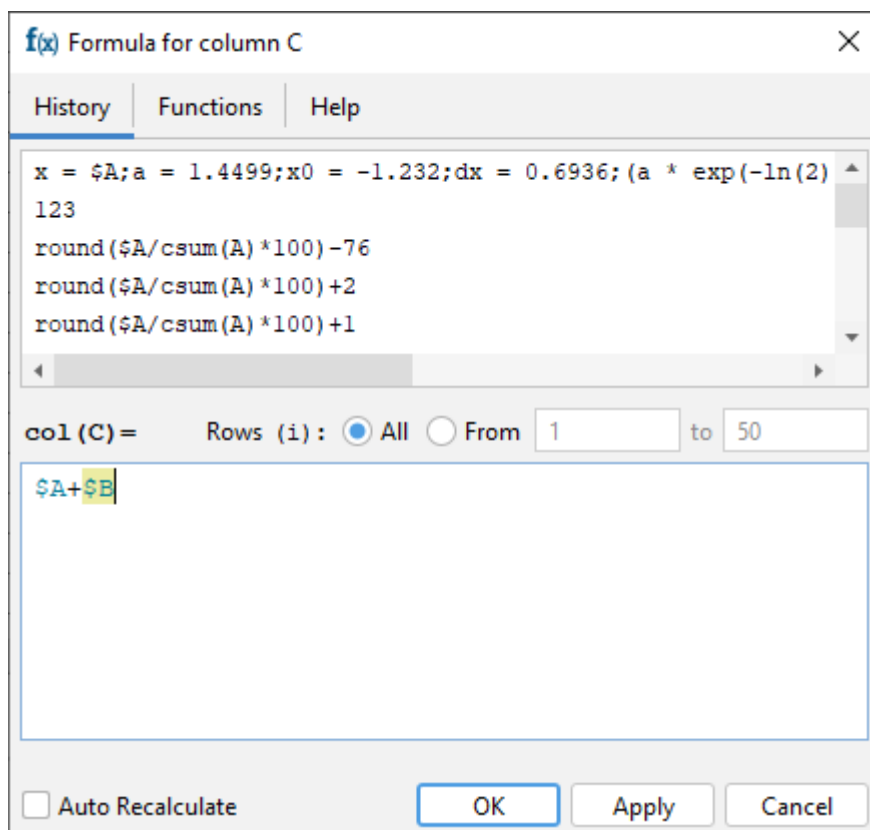


Use `Ctrl+//` / `Cmd- /` keyboard shortcut to comment selection. Comments can be multi-line. Note that the single line comments using a symbol on the line start (like `//` or `%`) are not supported because line breaks are not taken into account in MagicPlot formula syntax.

## Simplified Column Formula Notation

We have simplified Column Formula syntax: column and cell values can be inserted using `$A` and `$A$1` instead of `col(A)` and `cell(A, 1)`. The old notation also works.

The new notation only works with constant column/cell indexes. Use `col` and `cell` functions if you need to vary the index, ex. `col(i)` and `cell(i-1, j+1)`.



## Formulas for Multiple columns

The same formula can be set for multiple selected columns. You can use this feature to compute matrices. The *i* and *j* variables are the current row and column indexes.

## Calculation in Reverse Row Order

You can swap *from* and *to* row indexes to reverse the calculation order. This can be useful if the cell formula contains the value of the previously calculated cell in the same column.

## Undo/Redo in Formula Editor

MagicPlot now supports Undo and Redo in formula editor using Ctrl+Z / Cmd-Z (Undo) and Ctrl+Shift+Z / Cmd-Shift-Z or Ctrl+Y / Cmd-Y (Redo) shortcuts.

## Optimized Table Scrolling and Redrawing

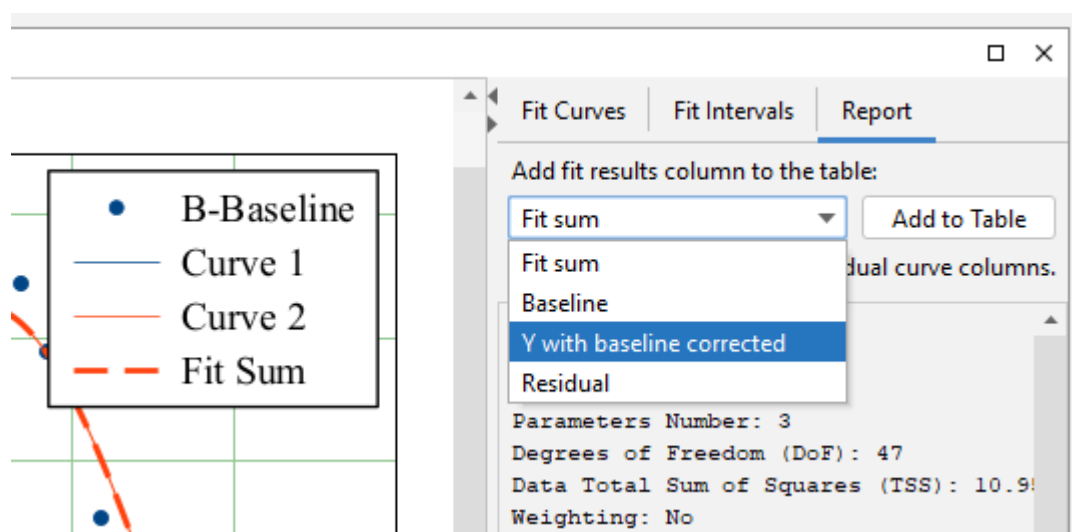
We have optimized the program code of the redrawing of the Table to eliminate lags when scrolling and editing a Table with tens or hundreds of thousands of columns.

## No more 'Data-Baseline' Column

Starting MagicPlot 2.10 The 'Data-Baseline' column is no more added to the Table when creating a Fit Plot. The 'Data-Baseline' column contain the Y values with subtracted baseline curve from Fit Plot – the exact Y values that are plotted. This feature was introduced in the first MagicPlot versions but it proved to be mostly usefulness by our customers.

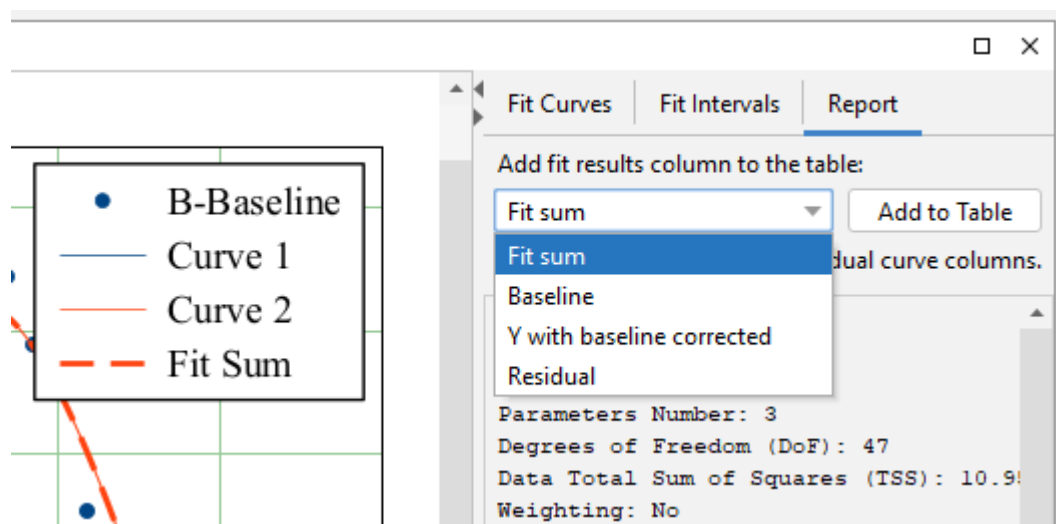
The 'Data-Baseline' auto-recalculated columns will be preserved when opening old projects for backward compatibility. You can deleted these columns manually.

Now you can manually create 'Data-Baseline' column among with other fit results columns using the Fit Report tab of a Fit Plot, choose Y with baseline corrected and click on Add to Table button:



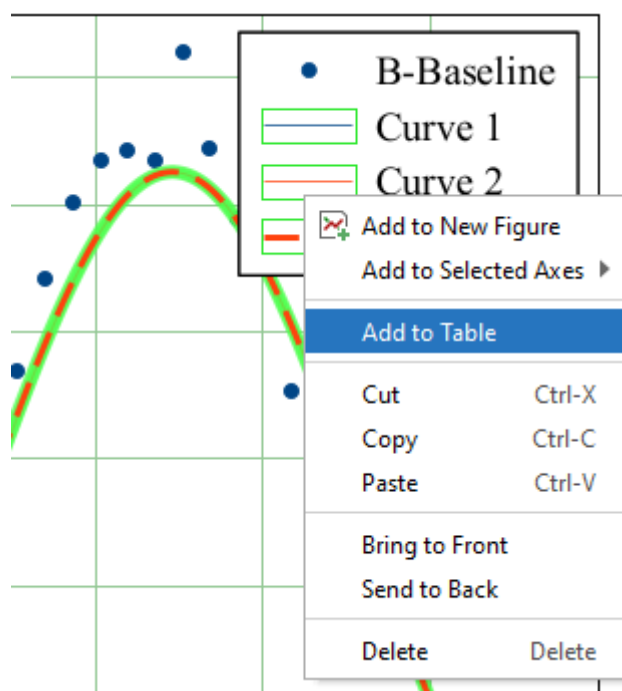
## Adding Fit Sum Column to the Table

You can simply create a column with Fit Sum and other values in the Table with Fit Plot data using Fit Report tab. The alternatives are: Fit Sum, Baseline, Y with baseline corrected, Residual:



Multiple columns from the selected individual curves (including Fit Sum) can be added to the table

using the context menu on the curve itself on the Fit Plot, legend or in the curves list:



The new curves are added to the Table where Y column of the Fit Plot data is located:

Results					
	A	B	C Curve 1	D Curve 2	E Fit Sum
1	2	-0.0869	4.2092e-7	0.6198	0.6198
2	1.918	0.0659	8.9475e-7	0.7359	0.7359
3	1.836	0.4188	1.8655e-6	0.8571	0.8571
4	1.754	0.6962	3.8147e-6	0.9791	0.9791
5	1.672	0.8799	7.651e-6	1.097	1.097
6	1.59	1.1056	1.5051e-5	1.2054	1.2054
7	1.508	1.3645	2.9039e-5	1.2992	1.2992
8	1.426	1.3762	5.4953e-5	1.3734	1.3734

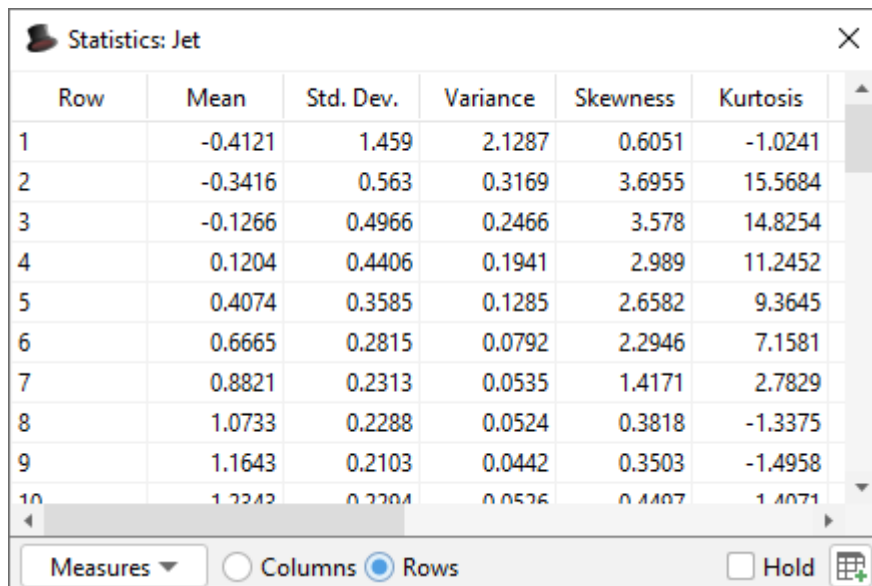
The Auto Recalculation is on by default for the created columns and can be switched off.

## Changes in Keyboard Shortcuts

- The keyboard shortcut for Undo History was changed to Ctrl+Shift+H / Shift-Cmd-H.
- A new shortcut for creating a Folder added: Ctrl+Shift+N / Shift-Cmd-N.

## Descriptive Statistics on Rows

The statistics on table rows can now be calculated using Descriptive Statistics dialog. The Columns/Rows switch was added:



Row	Mean	Std. Dev.	Variance	Skewness	Kurtosis
1	-0.4121	1.459	2.1287	0.6051	-1.0241
2	-0.3416	0.563	0.3169	3.6955	15.5684
3	-0.1266	0.4966	0.2466	3.578	14.8254
4	0.1204	0.4406	0.1941	2.989	11.2452
5	0.4074	0.3585	0.1285	2.6582	9.3645
6	0.6665	0.2815	0.0792	2.2946	7.1581
7	0.8821	0.2313	0.0535	1.4171	2.7829
8	1.0733	0.2288	0.0524	0.3818	-1.3375
9	1.1643	0.2103	0.0442	0.3503	-1.4958
10	1.2242	0.2204	0.0526	0.4407	1.4071

Measures ☐ Columns ☒ Rows ☐ Hold

## Other Minor Enhancements

- 0000567: [Other] Adding table curve to multiple selected figures when copy-pasting table
- 0000256: [Processing] Add empty cell (NaN) check function in column formula syntax

## Bugs Fixed

- 0000554: [Other] Incorrect braces highlighting in formulas with line breaks after paste on Windows
- 0000576: [Other] When copying color map plotable to another project with (table copy) the links to index columns are incorrect
- 0000484: [Drawing] Drawings are not snapped to canvas borders and center
- 0000570: [Other] In project tree inside Figure properties dialog moving Axes boxes and curves leads to creating a copy instead of moving
- 0000571: [Other] Drop target in Project tree with axes boxes and curves visible can be incorrect if only part of children is visible in the tree
- 0000568: [Other] The title of Export menu item in Project menu is not updated according to selected in project tree or active window
- 0000552: [Other] If Project Tree is not focused, it will not get focus when opening context menu on right click.
- 0000530: [Other] Pasting a fit curve from another project comes with pasting data table from original fit plot
- 0000527: [Plots] Color map with manually set inverted range and axis scale from bigger to lower is drawn as non-inverted
- 0000564: [Other] When pasting to multiple selected locations, dependent components must be copied only once
- 0000563: [Other] Draw instrument is not preserved when switching internal windows
- 0000562: [Other] Corrupted Fit Plot structure is pasted between the projects if canvas (Figure of Fit Plot) or curves table is focused
- 0000443: [Other] Annoying restoring of open windows after closing one of them maximized
- 0000534: [Table] Inspector toolbar update and table scroll is slow when adding 1000 rows to 10000 column table

- 0000464: [Other] Slow performance of Combo Box columns selector for big column count (10000)
- 0000526: [Other] Error in undo table creation after formula editing
- 0000508: [Other] Quick plot is not updated after column recalculation
- 0000521: [Other] Annoying selection in Project Tree when closing non-active window
- 0000522: [Plots] The legend background box does not account multi line text (regression)
- 0000402: [Other] Cannot put fit curve to the end of fit curves list in some circumstances
- 0000385: [Table] Constants A, B,... are not properly converted without col() if appropriate column is deleted

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