Interpolation issues with Mesh and Contour graphs.

When SigmaPlot graphs a mesh or contour graph, if the X and Y data forms a regular matrix, the graphs are usually as expected. When the X and Y values are not so spaced, SigmaPlot interpolates values, and can give unexpected results. This article covers other options for generating data for these graphs.



The spacing is not important, but the values must be the same, and all present. When this is so, we get a graph as below:



If there is any dither in the X or Y values, SigmaPlot will interpolate, defaulting to 24 intervals in X and Y:

3D Graph 2

3D Graph 3



In this example, two of the Y values deviated by 0,01. The interpolation pushs the highest point on the graph above any measured values. This can be extreme when there is much deviation in all of the data.

To get a result closest to the top graph in this article, we can use the Smooth 3D Data tool in the Analysis ribbon, Smoothers.

Smoother 3D - Select Dat	a	Data for Source Z:
Date         I           Image: Ima	Select the input data for smoothing by dicking the columns in the worksheet.	Selected Columns Source X: Column 1 Source Y: Column 2 Source Z: Column 3
4 62.4300 73.00 Help Cancel	Back	Data From XYZ ▼ <u>N</u> ext <u>F</u> inish

We select the Source Data

Smoother 3D - Select Data	x
Select the columns for your results           Data         *           1.1 Time         2.0xyc           1         55.7300         78.00           2         57.8800         75.00           3         60.0200         76.00           4         62.4300         73.00	Columns First Empty Results Predicted: First Empty Residuals: First Empty Plot Results
Help Cancel <u>B</u> ack	Next Einish

Save the predicted values

Smoother 3D - Select Data	×
Select the columns for your results           Date         *           1.Time         2.0xyc           1         55.7300         78.00           2         57.8800         75.00           3         60.0200         76.00           4         62.4300         73.00	Columns First Empty Results Predicted: First Empty Residuals: First Empty Plot Results Plot Results
Help Cancel <u>B</u> ack	<u>N</u> ext <u>Finish</u>

And can graph the results. Important here is that after clicking Finish, the Options are selected:

Smoothed Surface Options	×
X values Minimum 1,000000	Y values Minimum 1,000000
M <u>a</u> ximum 4,000000	M <u>a</u> ximum 6,000000
Intervals 3	Intervals
Bandwidth method © <u>F</u> ixed (a) <u>N</u> earest neighbors	V Plot raw data
Help	OK Cancel

Below is a graph with the default intervals, but with Nearest neighbors selected:

## Nearest Neighbor smoothing



If the interval is set to closely match the original data, we get even closer to the top graph: Nearest Neighbors, match intervals

