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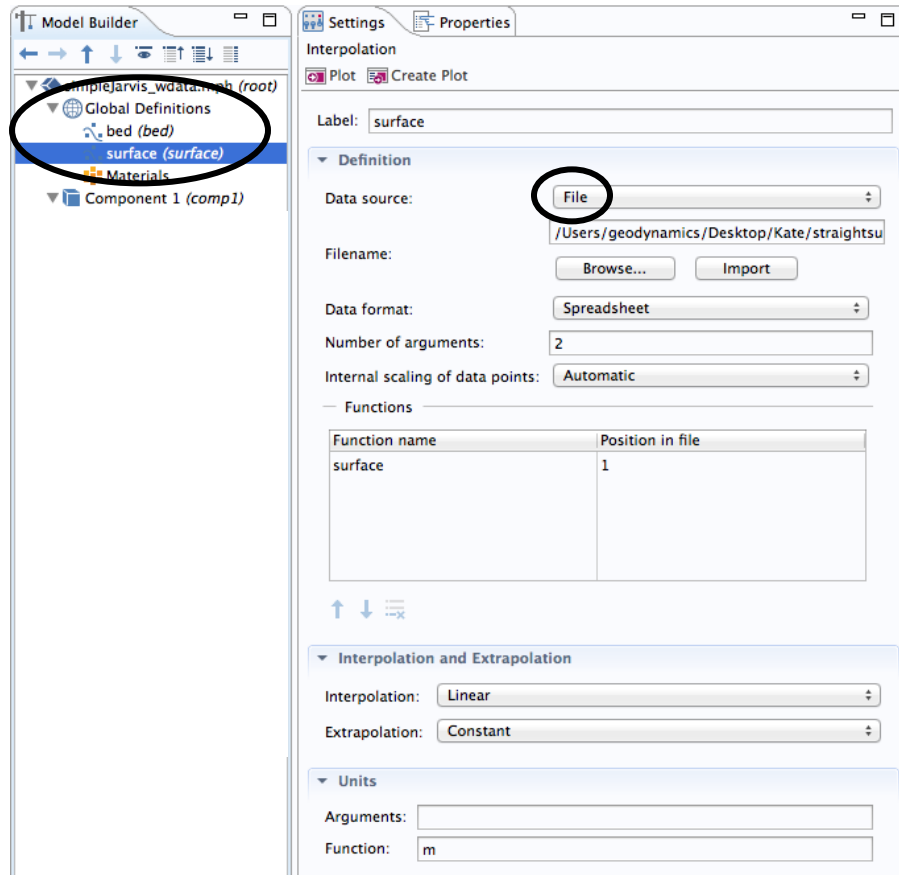
Page 4: Creating a Geometry from your Imported Data

Importing Data into COMSOL

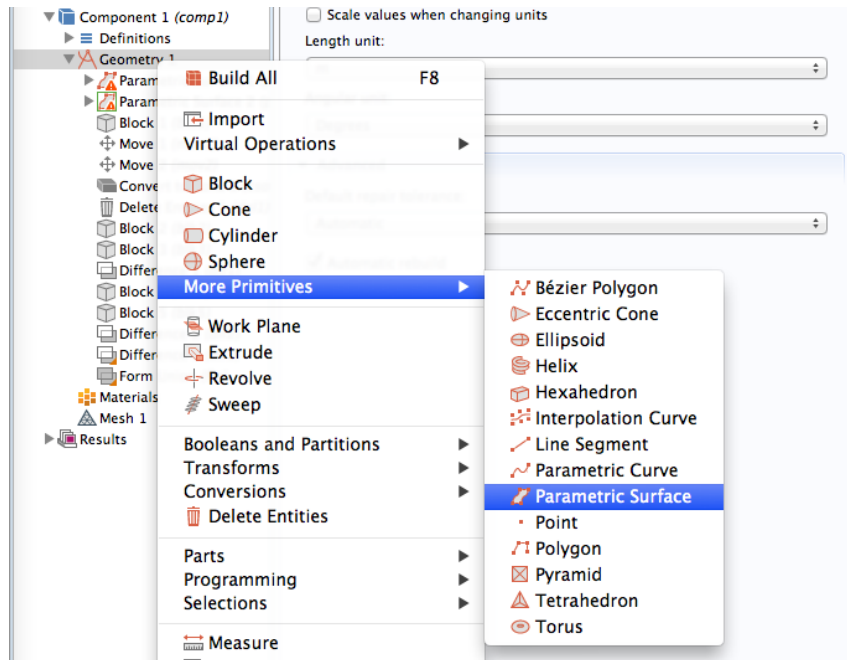
- 1) Start a new COMSOL file.
- 2) In the Model Builder under Global Definitions:

Right click > Functions > Interpolation

In the Settings tab that comes up when that Interpolation is selected, change “Data Source:” from “Local table” to “File” in the dropdown menu. This allows you to browse for your .txt file with the surface data in it. Name this Interpolation “surface”, “bed”, or some other function name that makes sense.



- 3) Now, under Geometry:
Right click > More Primitives > Parametric Surface

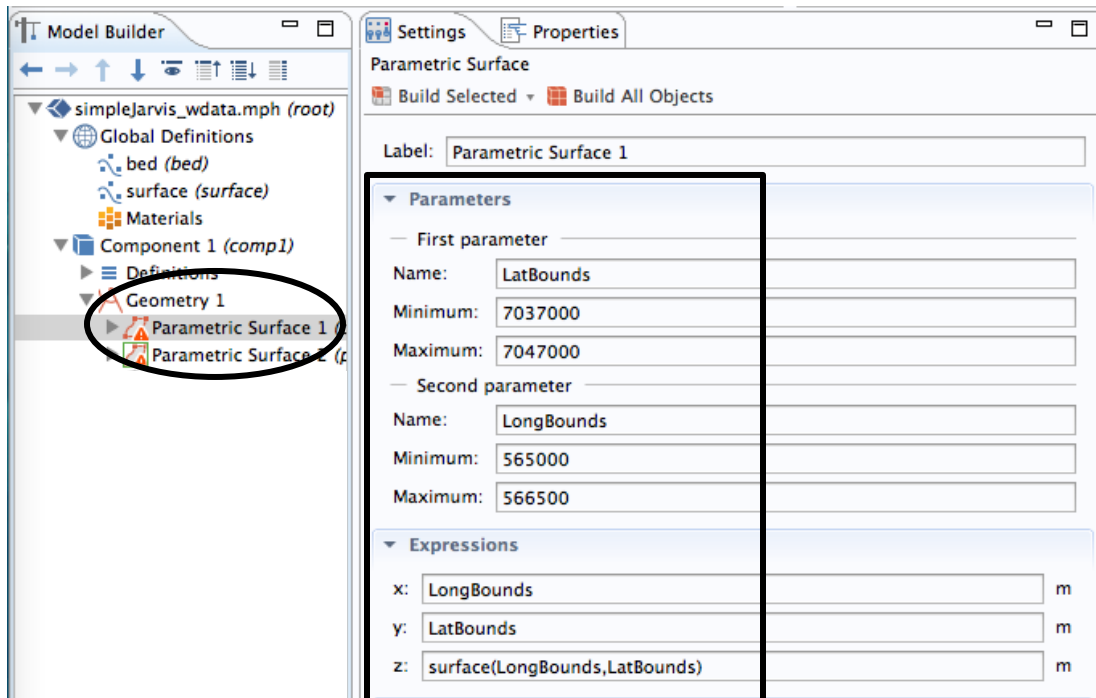


In the setting tab for this Parametric Surface, you can create x and y bounds (like latitude and longitude) and refer to your interpolation with those parameters.

For example: `interpolation1(x,y)`

Or in this case: `surface(LongBounds,LatBounds)`

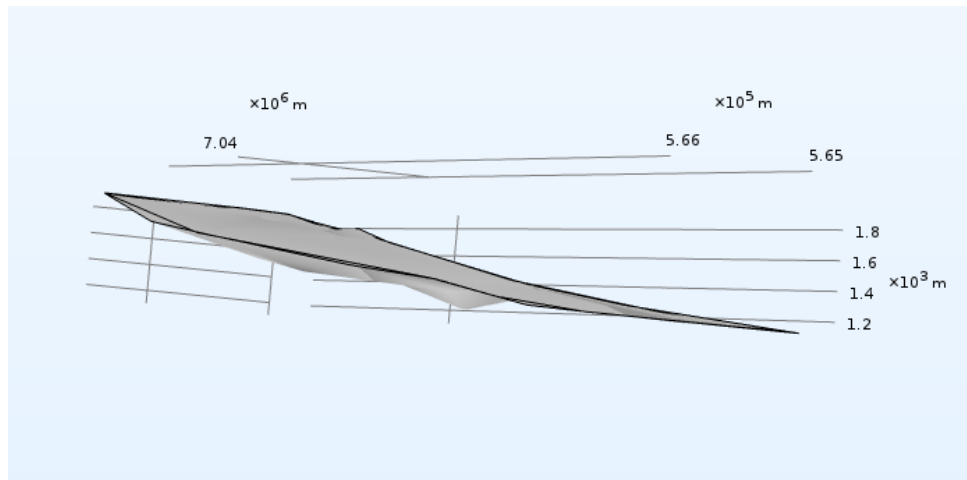
This generates a rectangle with those bounds as the edges and the surface as the height.



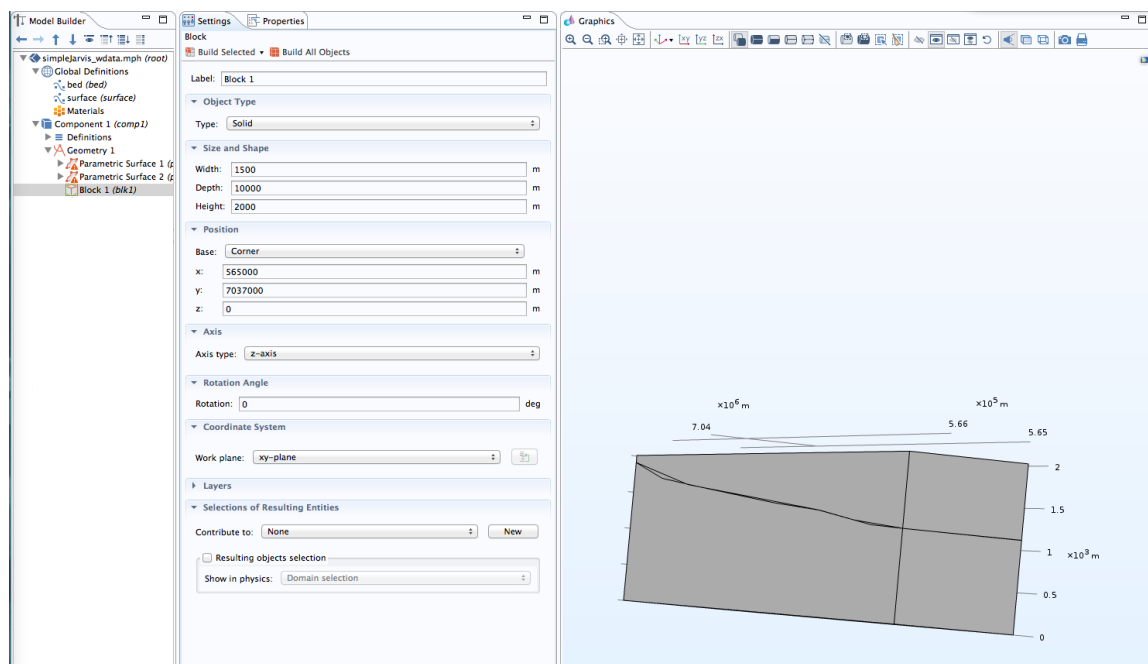
You can repeat this with as many surfaces as you would like, say, the surface and the bed of a glacier. But be careful, COMSOL doesn't like creating geometries when there are complicated shapes near each other. If your system allows for it, separate the surface and the bed with block of some height (height can depend on how thick you want your system to be). How to do this is shown below.

Creating a Geometry from Your Data

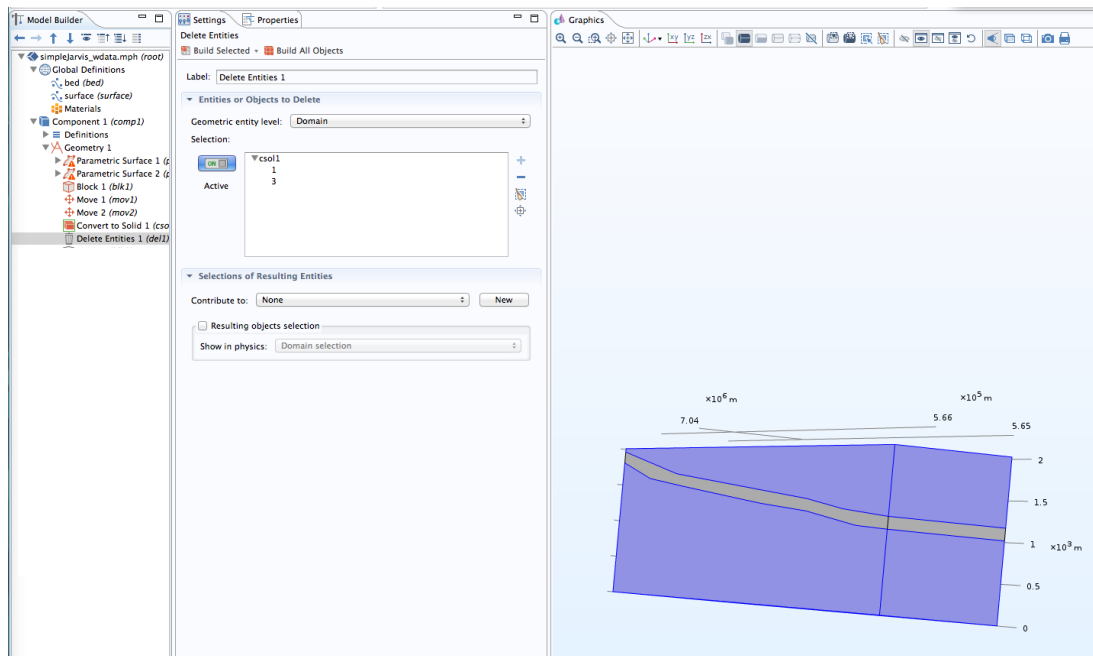
- 1) Have your surface and your bed with your chosen bounds.



- 2) Create a block that is the size of those bounds. Height doesn't matter as long as both surfaces are within it.



- 3) Insert a “Move” command (Geometry > Transforms > Move) and move the surface (or bed) to the depth you would like. If your surface and bed data are very close together or overlapping, this might take a few tries of increasing depth until the surfaces are far enough apart that COMSOL doesn’t get confused. An error message will appear in the next step if they are too close together.
- 4) Convert to Solid (Geometry > Conversions > Convert to Solid). Select your surfaces and your block and Build Selected.
- 5) Now you can get rid of the extra parts of the block that you don’t want around anymore. Geometry > Delete Entities and select the remainder of the block outside your surfaces.



- 6) Now you’ve got a geometry with surface data! Go ahead and Form Union or add other components to meet your needs!

