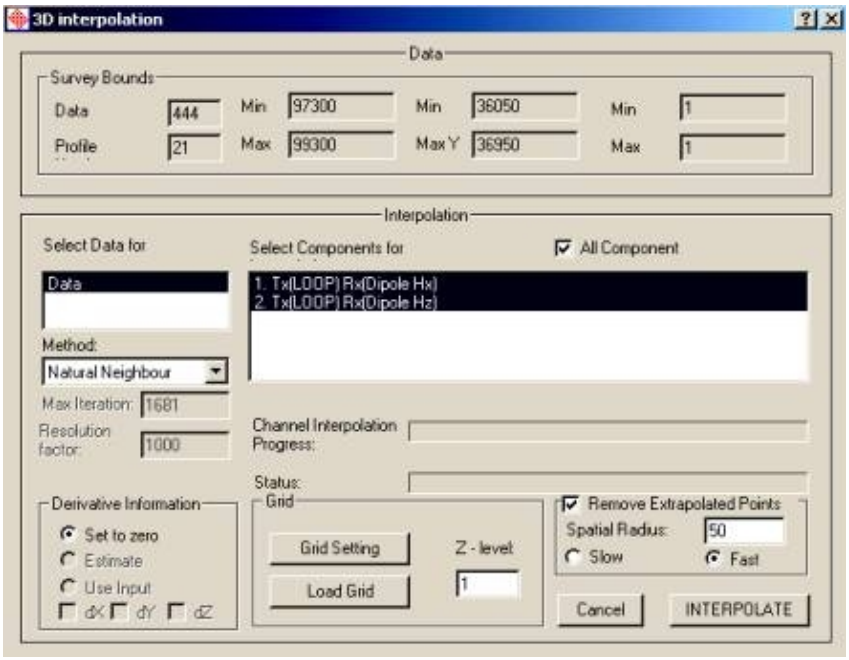
Gridding

EMIGMA offers 5 gridding algorithms and an easy-to-use and intuitive interface. You have to specify the terms of interpolation and to define the desired parameters of your grid, and your grid is ready. You can also load an existing grid from your database.

Select the data set to interpolate in the **Database** dialog and click the **Gridding** button on the main toolbar of EMIGMA. The **3D Interpolation** dialog will open, with the top section (**Data**) showing the profile and coordinate information of your data set:



3D Interpolation Dialog

To create a grid:

Specify the Terms of Interpolation

Specify Grid Parameters

Load an Existing Grid

and click **INTERPOLATE** in the right-hand corner of the **3D Interpolation** dialog.

Notes. To view the interpolation results, click the **GridPresentation** button on the main toolbar of EMIGMA

To view grid information, click the **Has Related Grid** button in the **Database** dialog.

Specify the terms of interpolation

In the **Interpolation** section of the **3D Interpolation** dialog:

- Select the type of data to interpolate in the **Select Data** field

All data obtained by means of import or simulation in EMIGMA, subjected to normalization, etc., are considered as core data and are referred to as ***Data***; all the rest calculated through various algorithms are considered as optional and are referred to in accordance with their type, e.g. ***Apparent Resistivity***, ***Apparent Depth***, ***Voltage***, etc.

- Click on a component in the **Select Components** field to involve it into interpolation or check the **All Components** box to have all components participate in the interpolation process
- Select the method of interpolation in the respective dropdown list.

There are five choices: **Natural Neighbour**, **Delauney Triangulation**, **Shepard** or True to data, **Thin Plate Spline** and **Minimum Curvature**, with the first being the most frequently used. If you select **Minimum Curvature**, type the maximum number of iterations to be performed and specify the resolution factor in the respective fields below, which in this case will become activated

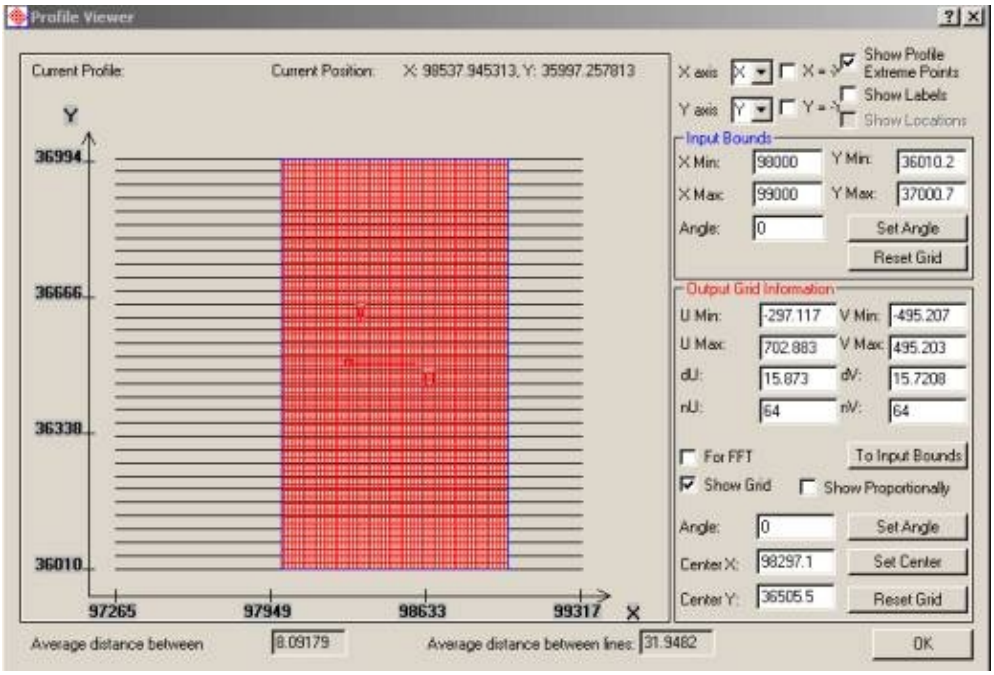
- If your data contain derivative information, you can carry out interpolation based on all the three derivatives at a time. In this case, the result will be more accurate in comparison with what is obtained when you use data as is. Turn the **Use Input** button on in the **Derivative Information** section and select the derivatives to participate in interpolation
- Check the **Remove Extrapolated Points** box to activate the respective section and forbid extrapolation to the no data locations
- Set a required spatial radius to restrict the area of interpolation.

In the present example: a spatial radius of 50 means that if there are no data in the radius of 50 m around a given point a grid cell center, this cell will be removed from interpolation

- Select between the slow and fast interpolation algorithms (slow is more accurate, but fast is almost always sufficient)
- Click **OK**

Specify grid parameters

Click the **Grid Setting** button in the **Grid** section of the **3D Interpolation** dialog . The **Profile Viewer** dialog will open:



In this dialog:

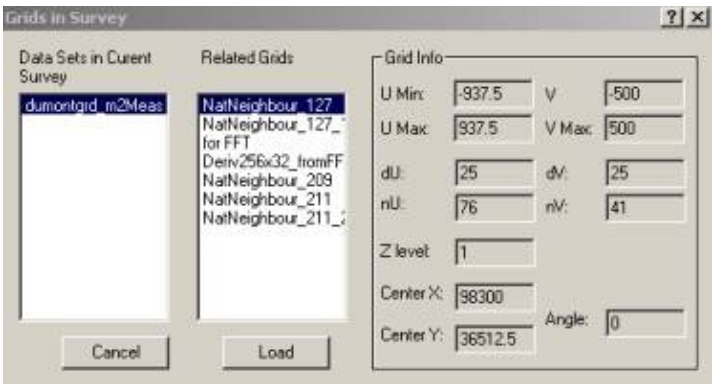
- Customize the coordinate system by selecting required settings in the upper right-hand corner of the dialog
- Select between the **Show Profile Extreme Points** and **Show Locations** options and check the **Show Labels** box to display the profile numbers (names)
- Specify the input bounds, a blue line enclosing the data to be involved in interpolation, in the X and Y **Min** and **Max** boxes of the respective section. Or, you can simply click and drag the input bounds (blue) right in the grid view field of the dialog. Set the rotation angle of the grid about its local center and click the **To Input Bounds** button

This will automatically change the **U** and **V** coordinates of the grid in the **Output Grid Information** section, and the input bounds (blue) and output grid bounds (red) will coincide

- If you want the output bounds cover a different area compared to the input grid, edit the **U** and **V** values and the angle of grid rotation in the **Output Grid Information** section. The output grid (red) will be changed, while the input bounds (blue) will stay the same
- To adjust the grid density, increase or decrease **dU** and **dV** (number of points) or **nU** and **nV** (length of a grid cell side) in the **Output Grid Information** section
- Check the **For FFT** box, if you want to subject your data to FFT. This will automatically change the **nU** and **nV** values to the n power of 2
- To display the grid, check the **Show Grid** box; to provide its proportional view, check the **Show Proportionally** box to the right
- To edit the local center of the grid (U vs V), type your values in the **Center X** and **Center Y** boxes in the bottom of the **Output Grid Information** section and click **Set Center**
- To reset the boundaries of your grid to the ones determined by the initial Input Bounds coordinates, click **Reset Grid** in the **Input Bounds** section if you changed the coordinates here or **Reset Grid** in the **Output Grid Information** section if you changed the values there
- Click **OK** to return to the **3D Interpolation** dialog

Load an existing grid

- Click the **Load Grid** button in the **Grid** section of the **3D Interpolation** dialog. The **Grids in Survey** dialog will open:



- Select the data set containing the grid you want to load from the **Data Sets in Current Survey** list and the grid itself from the **Related Grids** list

The settings of the grid to be loaded will be displayed in the **Grid Info** section on the right

- Click **Load** to load the grid