

03-09-2020 – Res2DInv/Res3DInv webinar Q&A

How do you decide to use finite-difference or finite-element for the forward modeling?

- If you include topography with the data set and for cross borehole datasets you will always be using the finite-element method, for flat datasets you can choose between the FD and FEM method, the results will be very similar, but the FD method is slightly faster.

Do you really need to know ALL the electrode elevations to include the topography in the inversion?

- No, you can add a few (2 or more) topography points, the topography will then be interpolated from these. You can read more in the manual in sections 7.1.3 and 7.2 for Res2DInv and in section 7.2.4 for Res3DInv. The manuals can be downloaded here: <https://www.aarhusgeosoft.com/download-geotomo>

If I am not mistaken the color scale has 16 colors by default. Is there any way I can limit this, say, to only 8 colors?

- The default number of colors is 17, currently this cannot be changed, but we are working on a new graphical user interface where one of the improvements will be much more flexible color scales and visualization options.

Is it possible to combine apparent resistivity results from different surveys (e.g. schlumberger, gradient and wenner) into one inversion?

- Yes you can use the “concatenate data” function to combine several .dat files (see section 8.8 of the Res2DInv manual), or you can use the general array format that will allow different array types to be mixed.

How can we control interpolation of data points in RES3D?

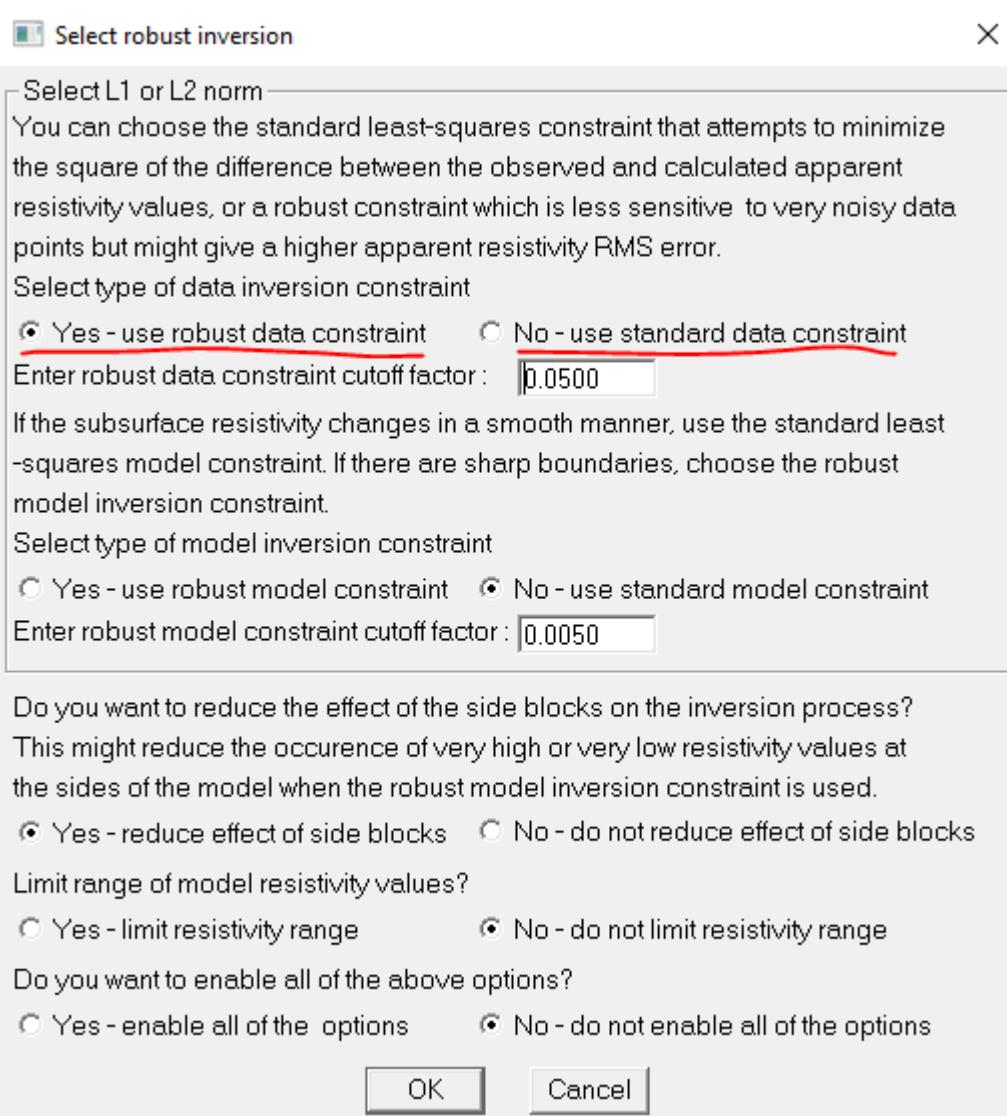
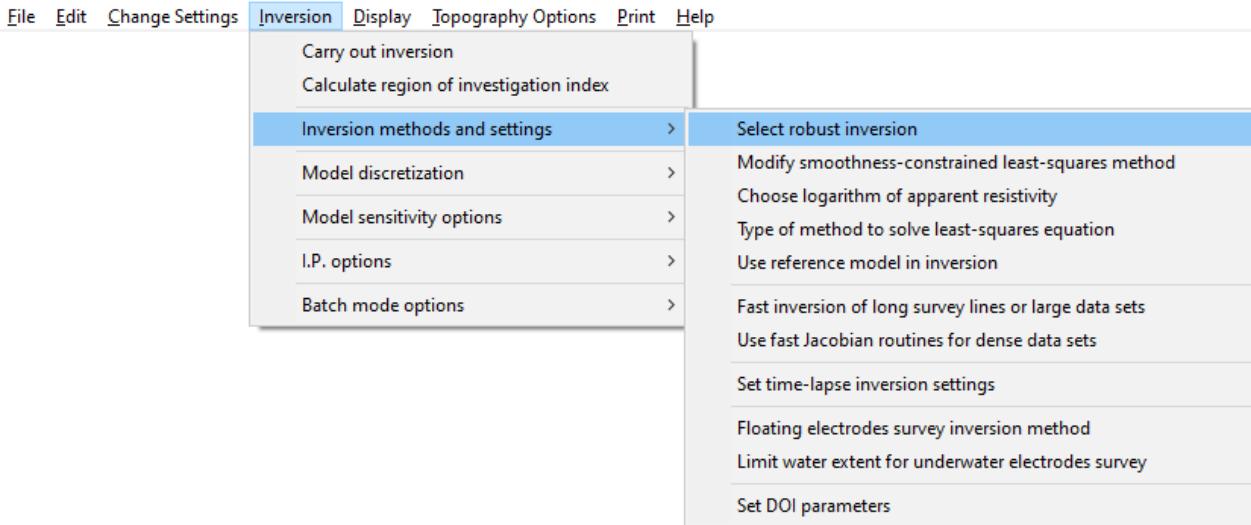
- Res3DInv is a true 3D inversion program and as such no interpolation of the data points is taking place, the resistivity model is created through an iterative process using 3D forward calculations and optimization, in exactly the same way as with Res2DInv but in 3D instead of 2D, if I have misunderstood the question you are welcome to send us an email for further clarification.

Can you export a grid file or an .xyz file of a vertical cut plane from the 3D viewer?

- The 3D viewer has no export options except for the option to save the image of the current view, or to save a video showing the displays made in the 3D viewer. So the way to go is to use the general XYZ export (found under “File->Model export->Export model to XYZ format”) and extract the coordinates for the desired cut plane.

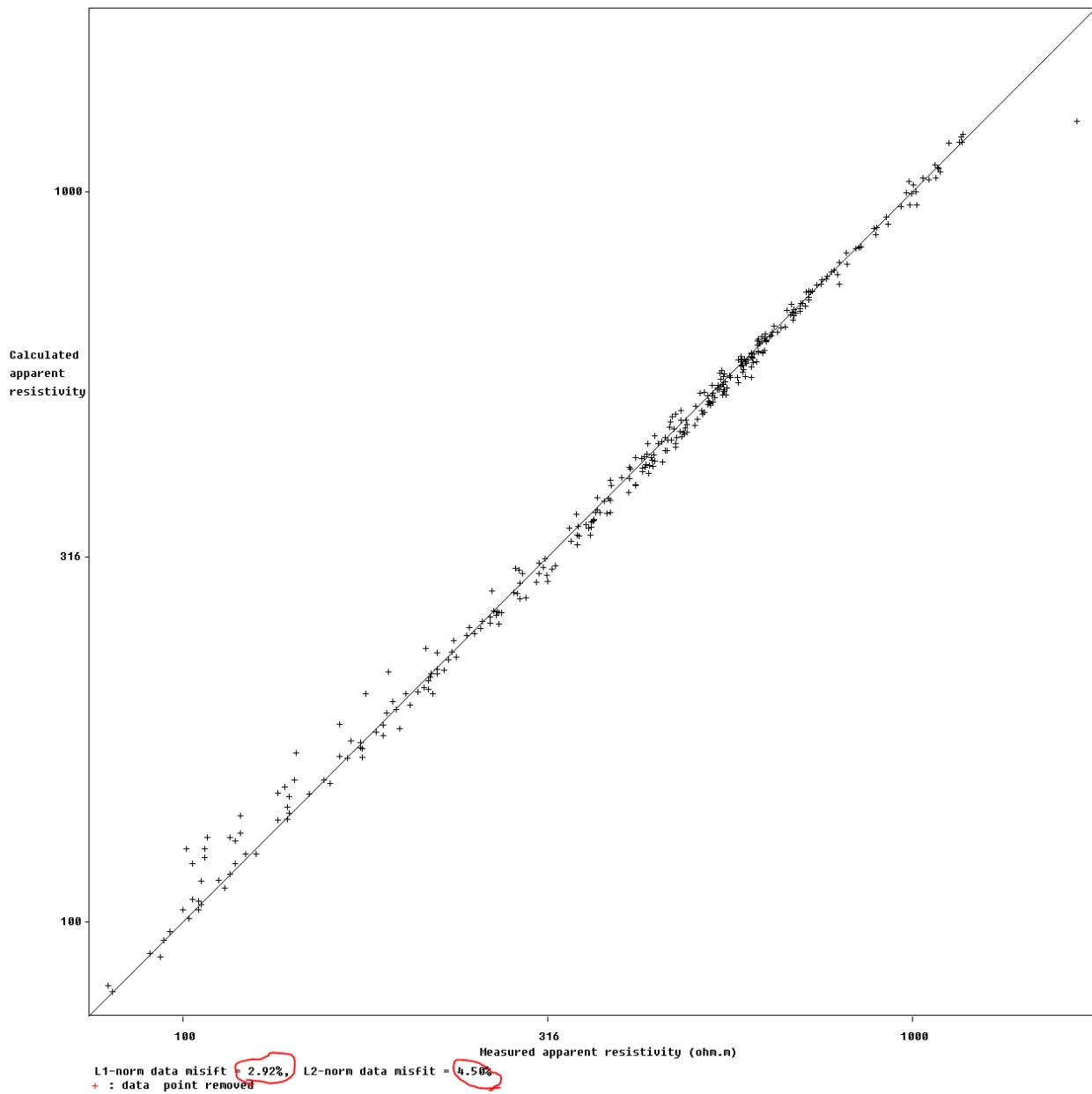
Difference between RMS and Absolute error?

- The RMS error is calculated using the L2 norm, and is displayed when this norm is used in the inversion. The absolute error is calculated using the L1(also known as robust) norm and displayed when this is used in inversion. The setting can be found here:



In the RMS error statistics page, both are show (Display->Show inversion results->Edit data->RMS error statistics)

Measured and calculated apparent resistivity correlation plot



What is gradient array?

- Gradient array is an array commonly used with multichannel systems, where you use the two outermost electrodes for current injection and then measure the potential between several of the electrode pairs between these at the same time, this speeds up data acquisition as you can record more than one data point for each current injection. You can read much more in Dr. Lokes course notes in chapter 2.5.9, they can be found here: http://www.agc-cloud.dk/Wiki/tiki-download_wiki_attachment.php?attId=229&page=W_GeotomoNotes&download=y

Is normal to have negative IP value?

- Negative IP values are relatively uncommon and are often due to noise, but they can also be genuine data points, you can read a lot more about it in this article:
https://lucris.lub.lu.se/ws/files/13583843/Dahlin_Loke_2015_Negative_apparent_chargeability_in_time_domain_induced_polarisation_data_JoAG.pdf