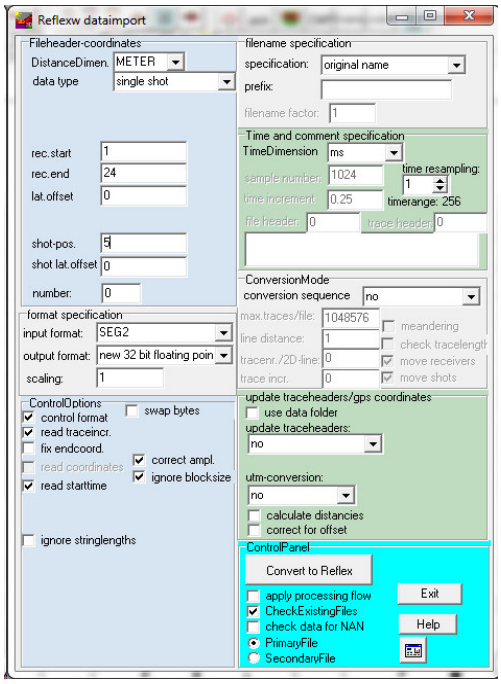
Processing and interpretation Refraction line1

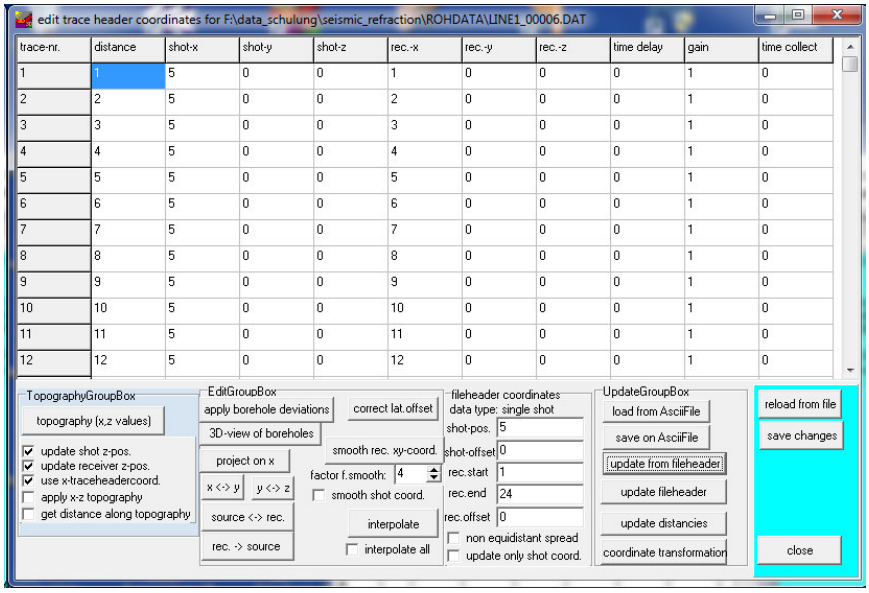
geometry:

24 receiver channels
Fixed Line from 1 to 24 m with 1 m increment
26 shots from 0 to 25 m with 1 m increment

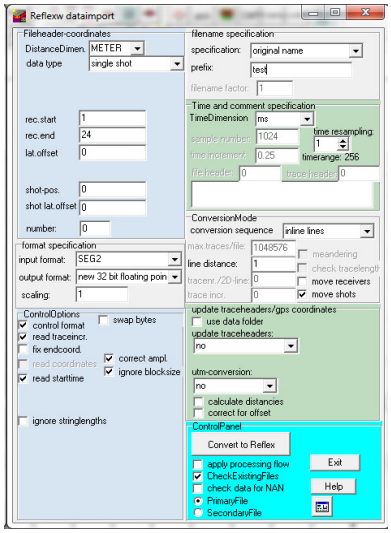
Import:

1. each file separately:
SEG2, no conversion sequence , data type to single shot Update the fileheader coordinates before each import (rec.start to 1, rec. end to 24, shot pos.) and then update the traceheaders from the fileheader within the traceheader tabella



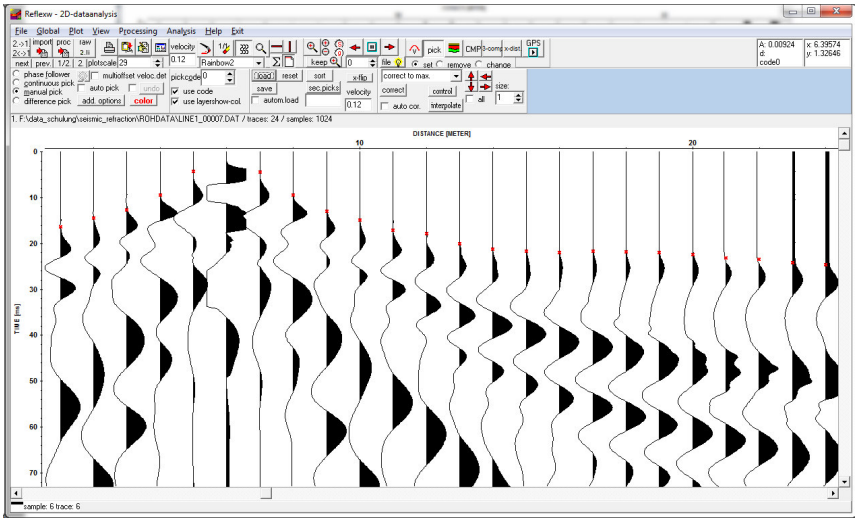


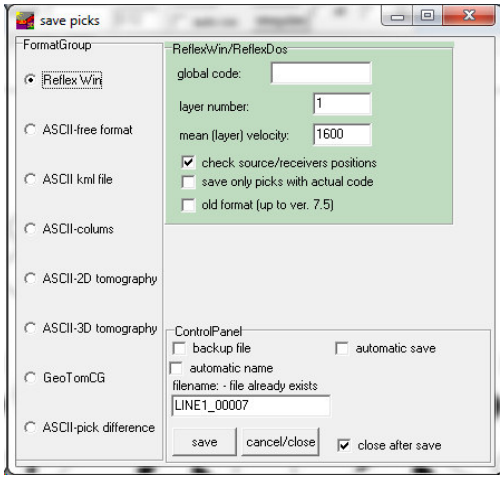
2. all files within one step - possible for an easy fixed receiver geometry and equidistant shots
SEG2, fileheader coordinate for the first shot (rec.start to 1, rec. end to 24, shot pos.to 0) conversion sequence inline lines, data type to single shot, line distance to 1 (corresponds to the shot increment), move receivers deactivated, move shots activated, update traceheaders from fileheader
Choose all wanted files after having pressed ConvertToReflex
Check the geometry after the import



Picking the first arrivals

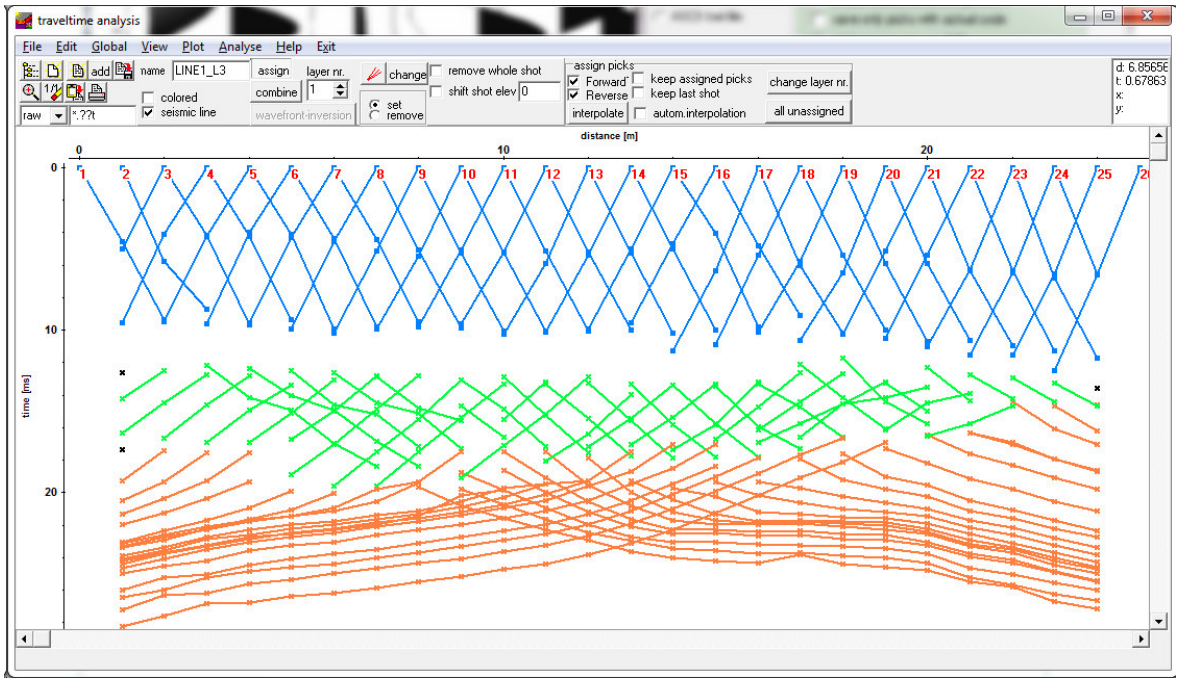
Pick the first arrivals for each shot and save them using the Reflex Win format.



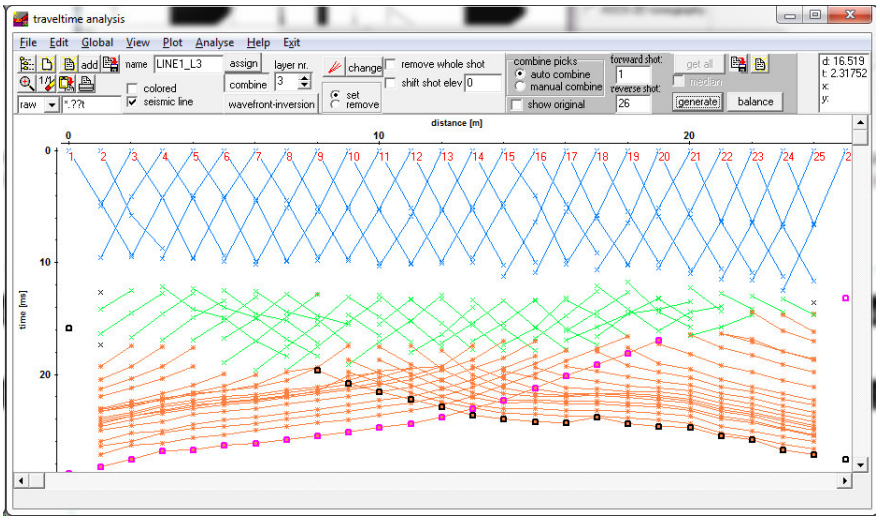


Wavefront inversion

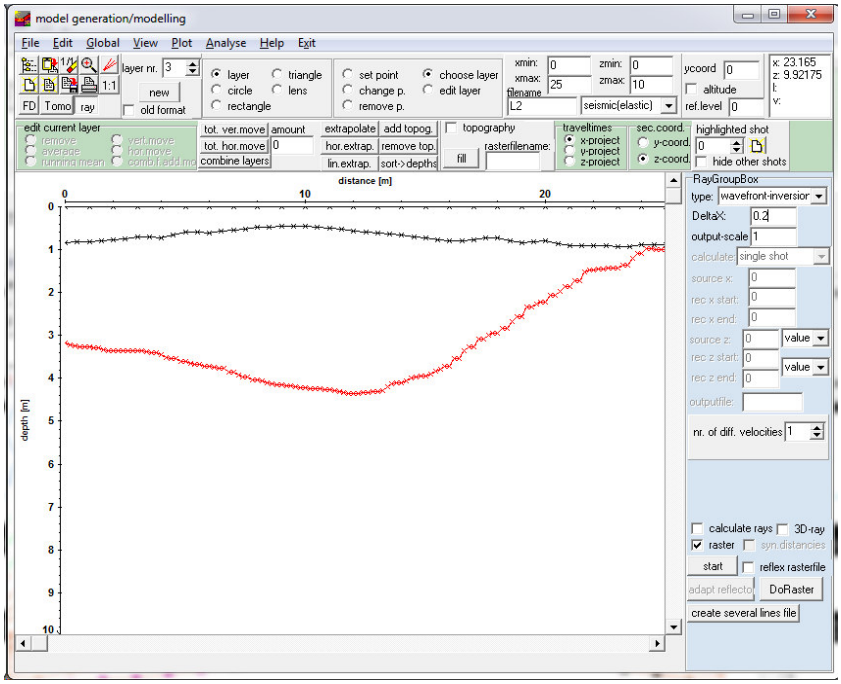
1. Put together the picked traveltimes within the traveltime analysis menu, insert Shot zero traveltimes -> file LINE1.pck
2. Assign the picks to individual layers (3 layer case) -> file LINE1_L3.pck



3. Click on combine for the inversion of the 3 layers. For the first layer clcik directly on wavefront-inversion, for the next ones first a combined forward and reverse traveltime curve must e generated by enetering the forward and reverse shot and clicking on generate



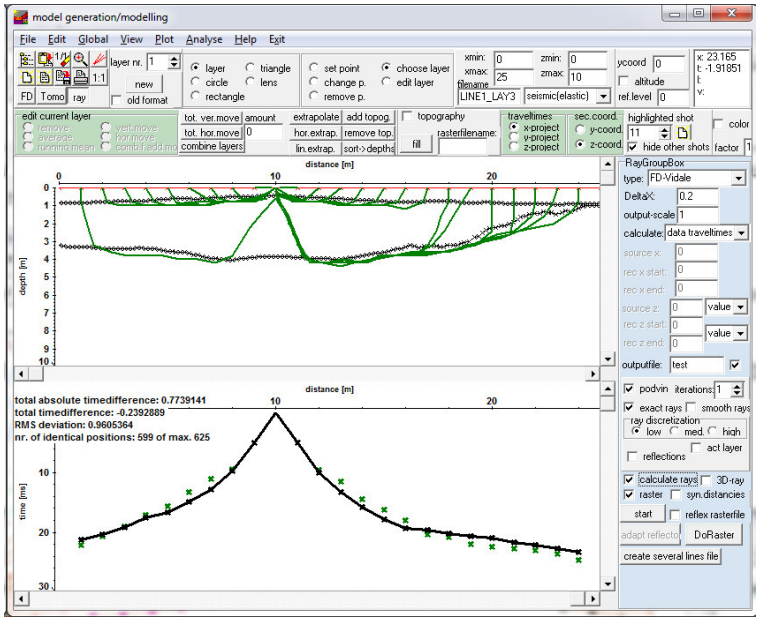
4. Perform wavefront inversion for the 3 layers -> files LINE1_L1.MOD, LINE1_L2.MOD, LINE1_L3.MOD, use a traceincrement of 0.2 m
inversion with 1 velocity for the refractors -> files line1_l1...line1_l3
inversion with 3 velocities for the refractors -> files line1_lay1...line1_lay3



raytracing check

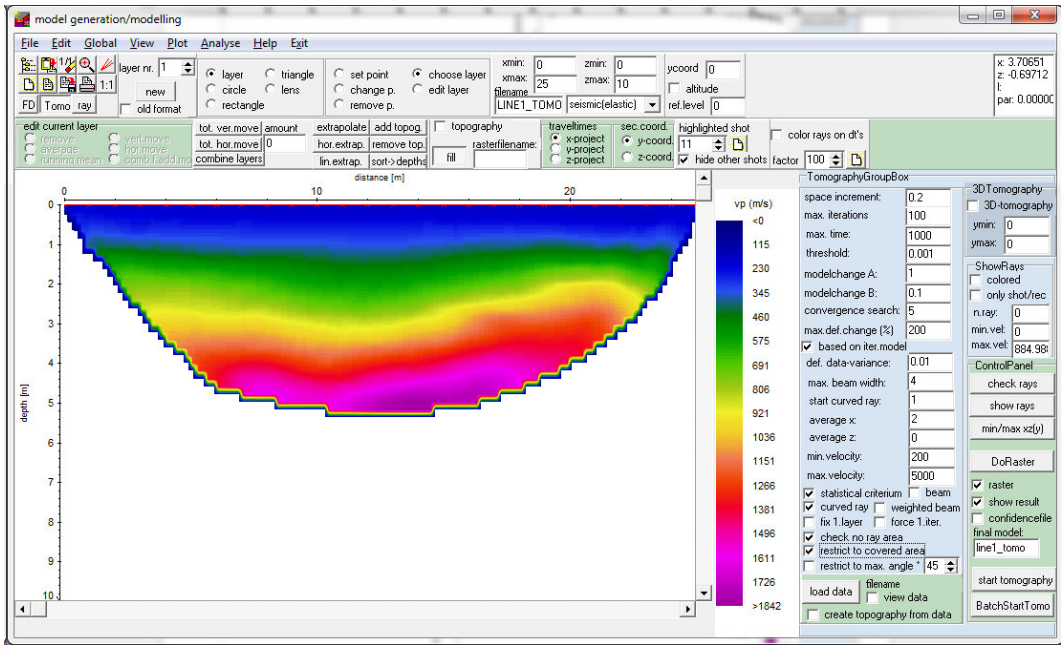
check the model using raytracing and perform any changes within the model if necessary

1. Load the data traveltimes
2. Click on ray and type FD-Vidale and calculate set to data traveltimes
3. Perform the raytracing using start



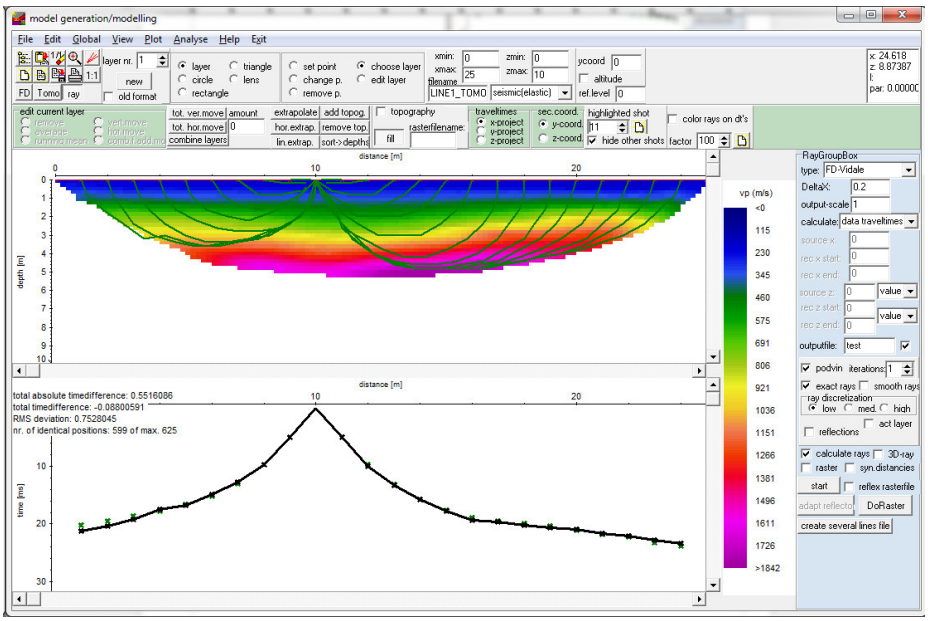
tomographic inversion

Tomographic inversion based on a simple 1 layer model (filename: line1_tomo_start.mod) with a vertical gradient



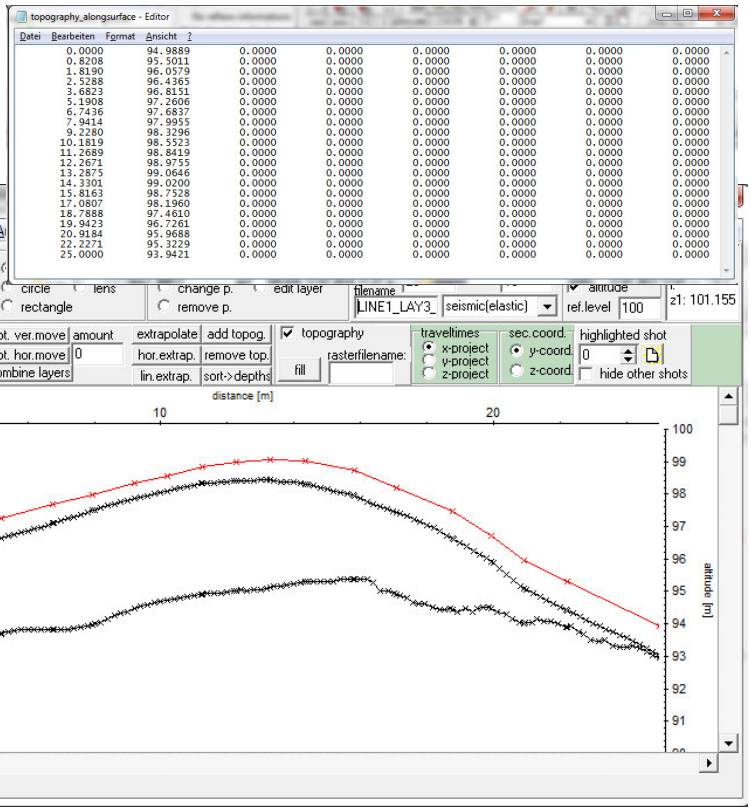
Again a raytracing check is the most suitable way in order to analyse the result.

For the tomographic result the option raster must be deactivated and the tomographic inversion result will be queried which forms the base for the raytracing.



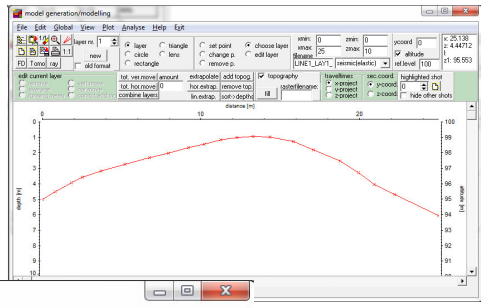
topography

include the topography after having done the wavefront inversion.



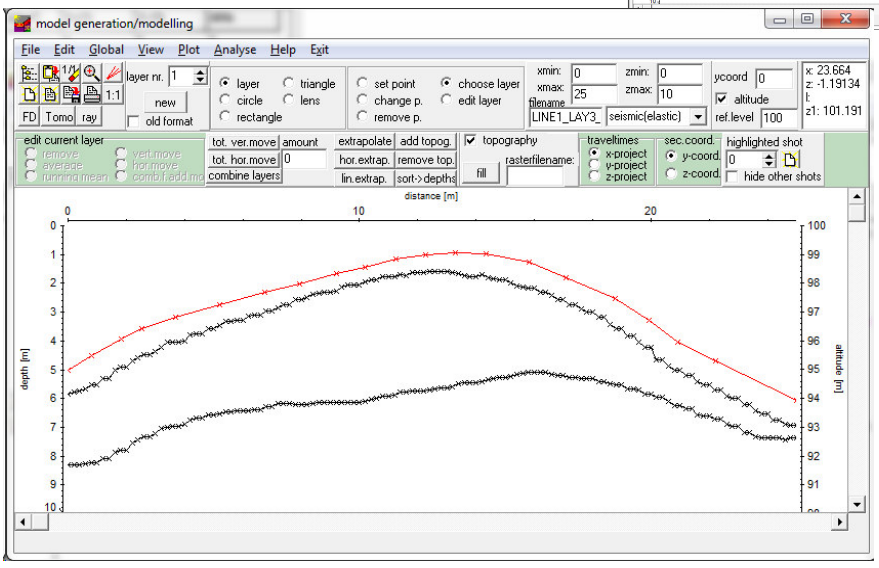
The topography is stored within the file topography_alongsurface.txt and contains elevations (altitudes). Therefore the option altitude must be activated and a reference level (in this case 100 m) must be entered.
Activate the first layer (upper model border).
Click on import (x,z) wihin the input of model parameters window for layer 1 (surface layer) and choose the file topography_alongsurface.txt.
Click on add topog.
Filename stored under LINE1_LAY3_top_after.MOD

include the topography during the wavefront inversion



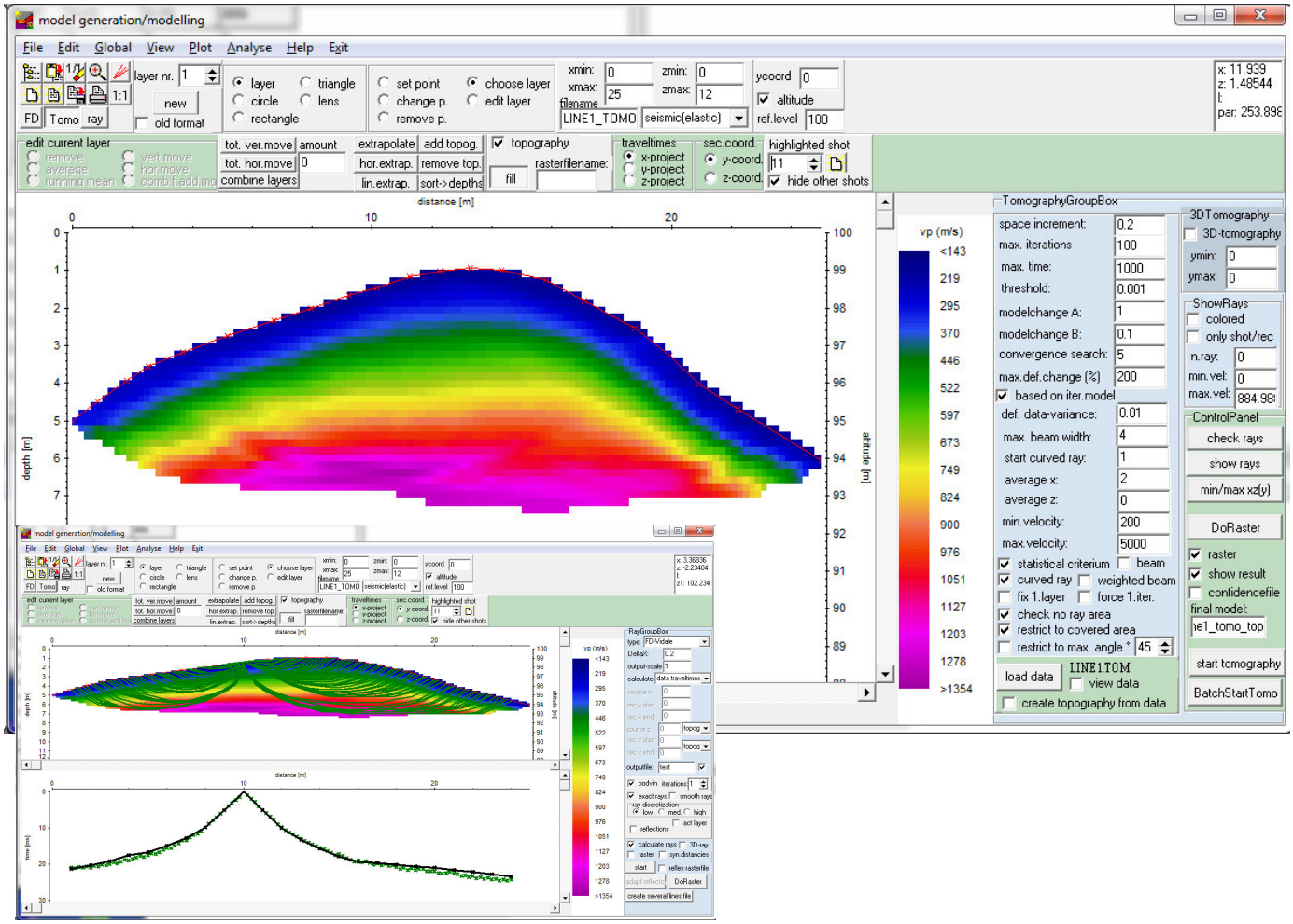
Perform the wavefront inversion for the first layer and add the topography for the 1. layer as described above.

Save the model and perform wavefront inversion for the nxt 2 layers using the topographically corrected frist layer model -> files LINE1_Lay1_top.MOD, LINE1_Lay2_top.MOD, LINE1_Lay3_top.MOD, use a traceincrement of 0.2 m



tomographic inversion

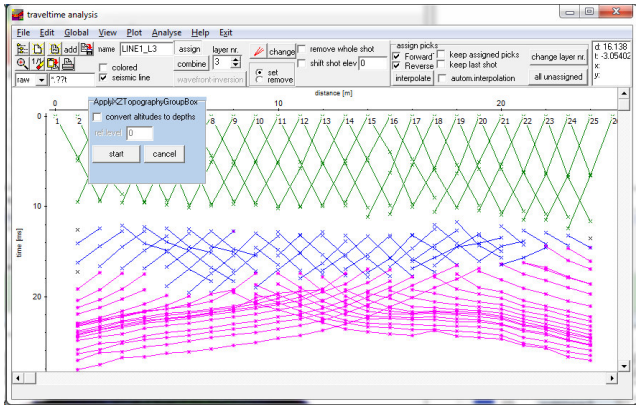
The tomographic inversion may also be performed based on a topographically corrected start model. Again simply add the topgoraphy for the 1. layer as described above and perform the tomography.



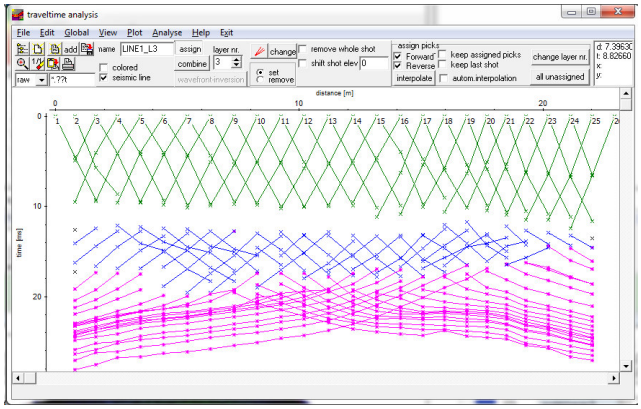
The topographic values do not need to have been stroed within the traveltimes. The program automatically moves the shot and receiver position to the topographic surface if it is present.

Strong topography

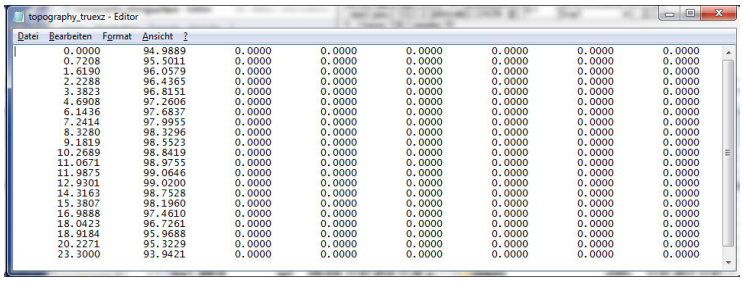
If a strong topography is present the coordinates measured along the surface do not represent the x-coordinates. In this case a correction must be performed. This is done within the traveltime analysis menu using the option edit/apply xz-coordinates.



->

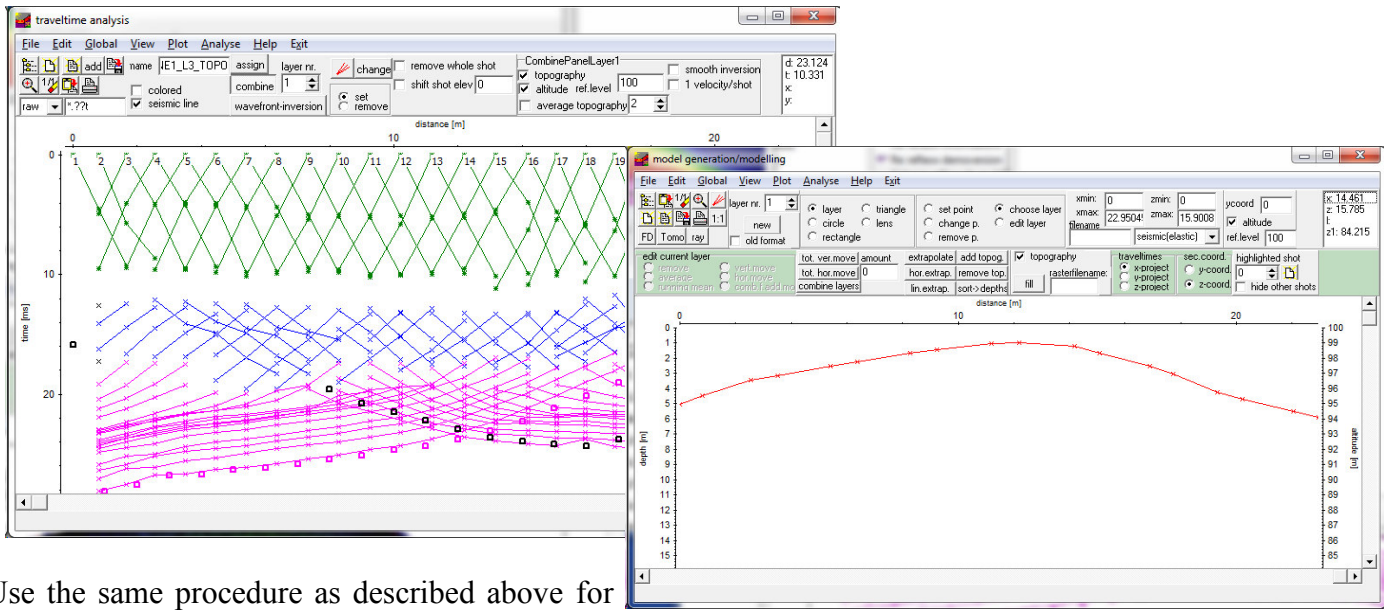


The ASCII-xz-coordinates must contain the true x-coordinates - file topography_truexz.txt



After having applied this correction the x-axis will be shortened. Now the picks (file Line1_l3_topo) contain the corrected x-coordintes as well as the z-coordinates.

The inclusing of the topography into the wavefront inversion will be done by activating the option topography for the 1. Layer inversion.



Use the same procedure as described above for the inversion of the further layers.

The same holds true for the tomographic inversion.