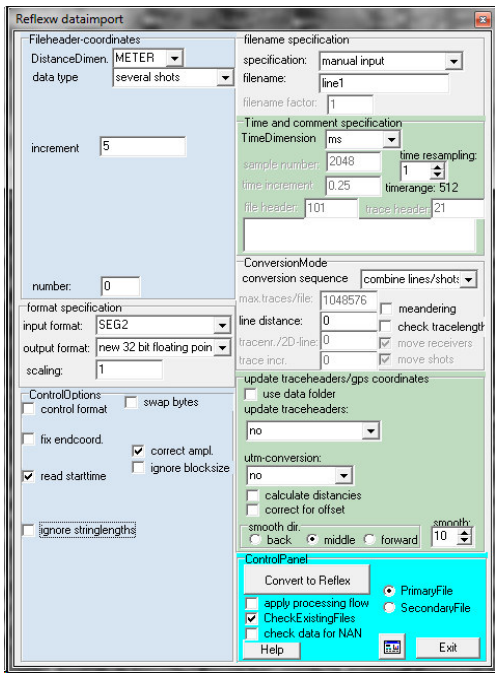
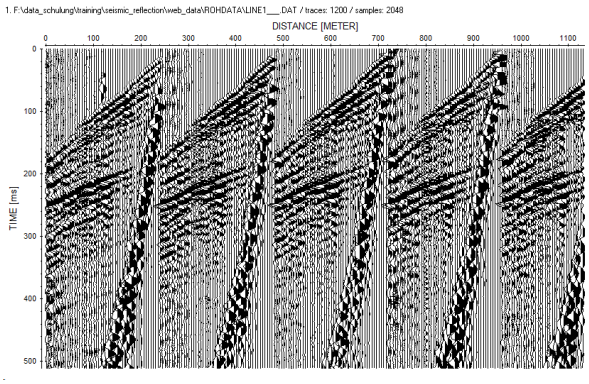
Seismic reflection Processing and stacking one fixed line

1. Import



data acquistion:
48 receiver channels
Fixed Line from 100 to 335 m with 5 m increment
25 shots from 350 to 230 m with negative 5 m increment

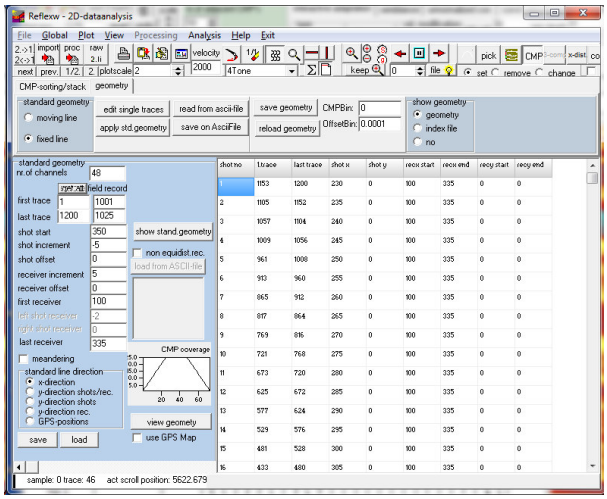
data Import (option file/import):
arameters: SEG2, combine lines/shots, increment set to 0,5, datatype to several shots, swap bytes deactivated
Click on Convert to Reflex and choose all files from 1001 to 1025
filename: line1___.dat
plotparameter: Wigglemode, scale 2



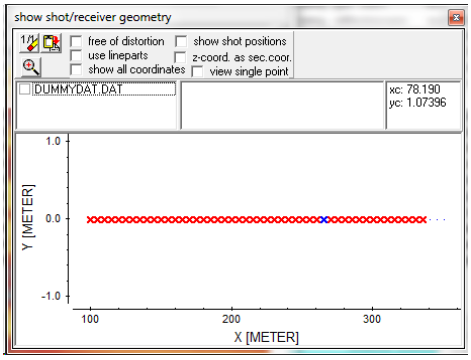
All shots have been stored within one file (display on the left with tracenormlize activated). The distance axis scale has no special meaning. It shows the summed up distance.

2. Geometry settings (Option CMP) for the file line1___dat:

1 fixed line with 48 channels
shot start set to 350 m
shot increment set to -5 m
receiver increment set to 5 m
first receiver at 100 and last receiver at 335
CMPBin may be set to a small value or 0
Click on apply std.geometry and save geometry



A control of the geometry may be done using the option view geometry, then click on the first shots no and you may scroll through the individual shots.

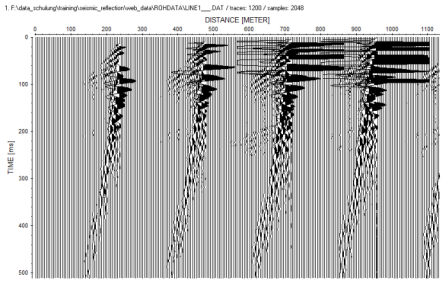


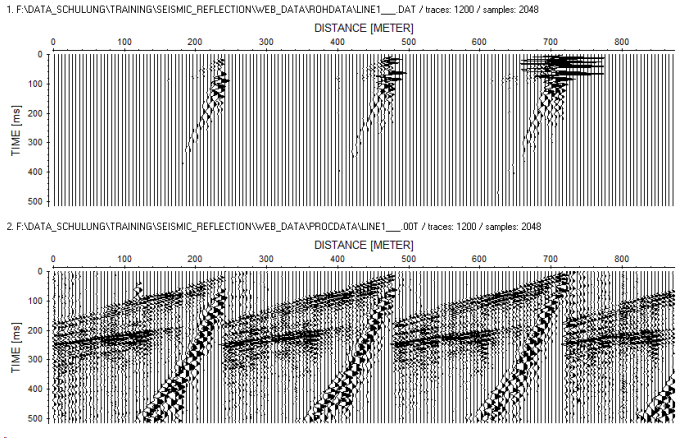
3. processing:

The main purposes of the processing are an energy normalization and to get rid of the direct waves (refractions) and the surface waves.

Energy normalization

The energy normalization is necessary because the stacking is done based on true amplitudes. Due to the different source receiver distancies the energy distribtution within one shots is very different.





One possitility is the use of the option **tracenormalize** under processing/gain

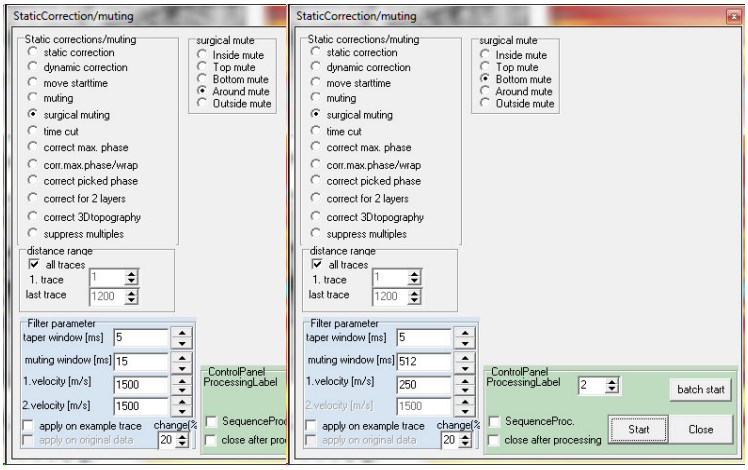
-> line1___.00t

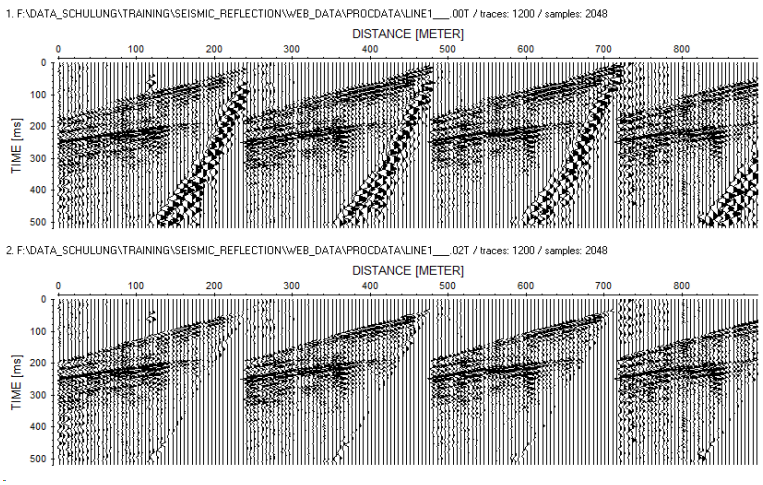
The next processing step serves for the decrease of the direct and surface waves. This may be done by

muting

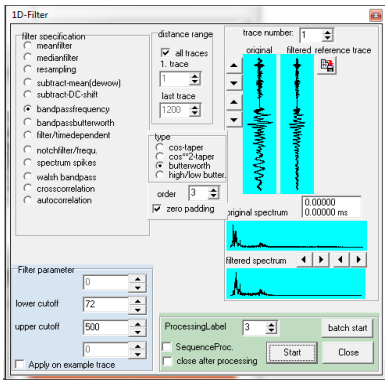
surgical muting under processing/muting
use around mute for the first arrivals (refractions) line1___00t -> line1___01t
use bottom mute for the surface waves
line1___01t -> line1___02t

-> line1___02t

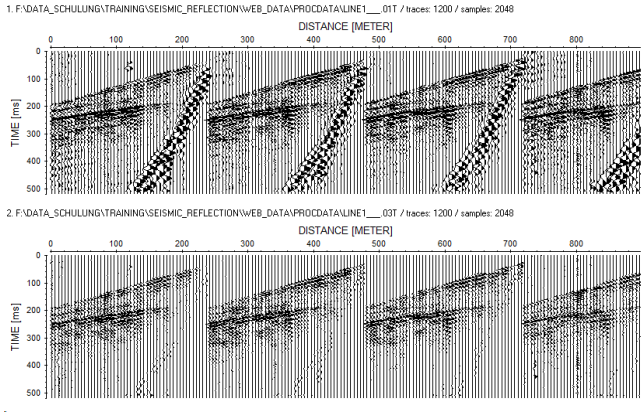




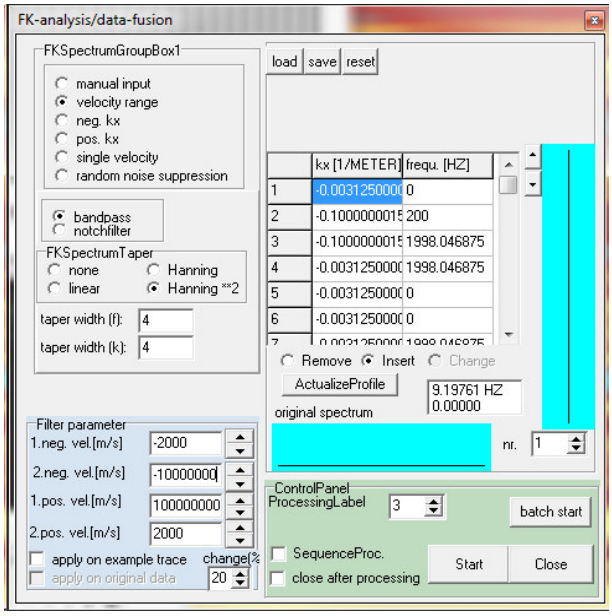
highpass bandpassfiltering for the elimination of the surface waves:



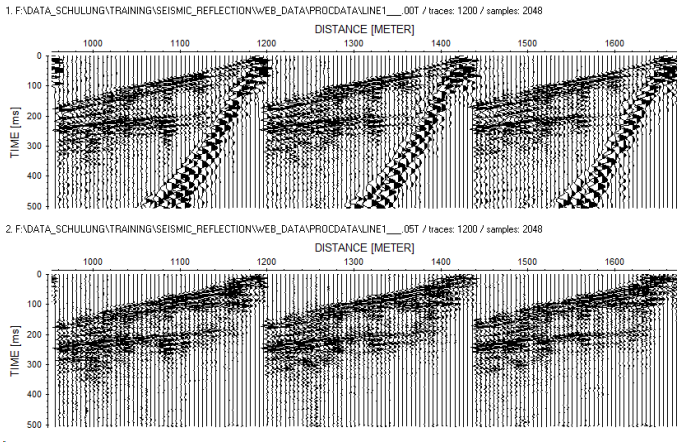
line1___01t -> line1___03t



fk-filtering lineparts with subsequent bandpassfiltering:



line1___01t -> line1___04t
line1___04t -> line1___05t

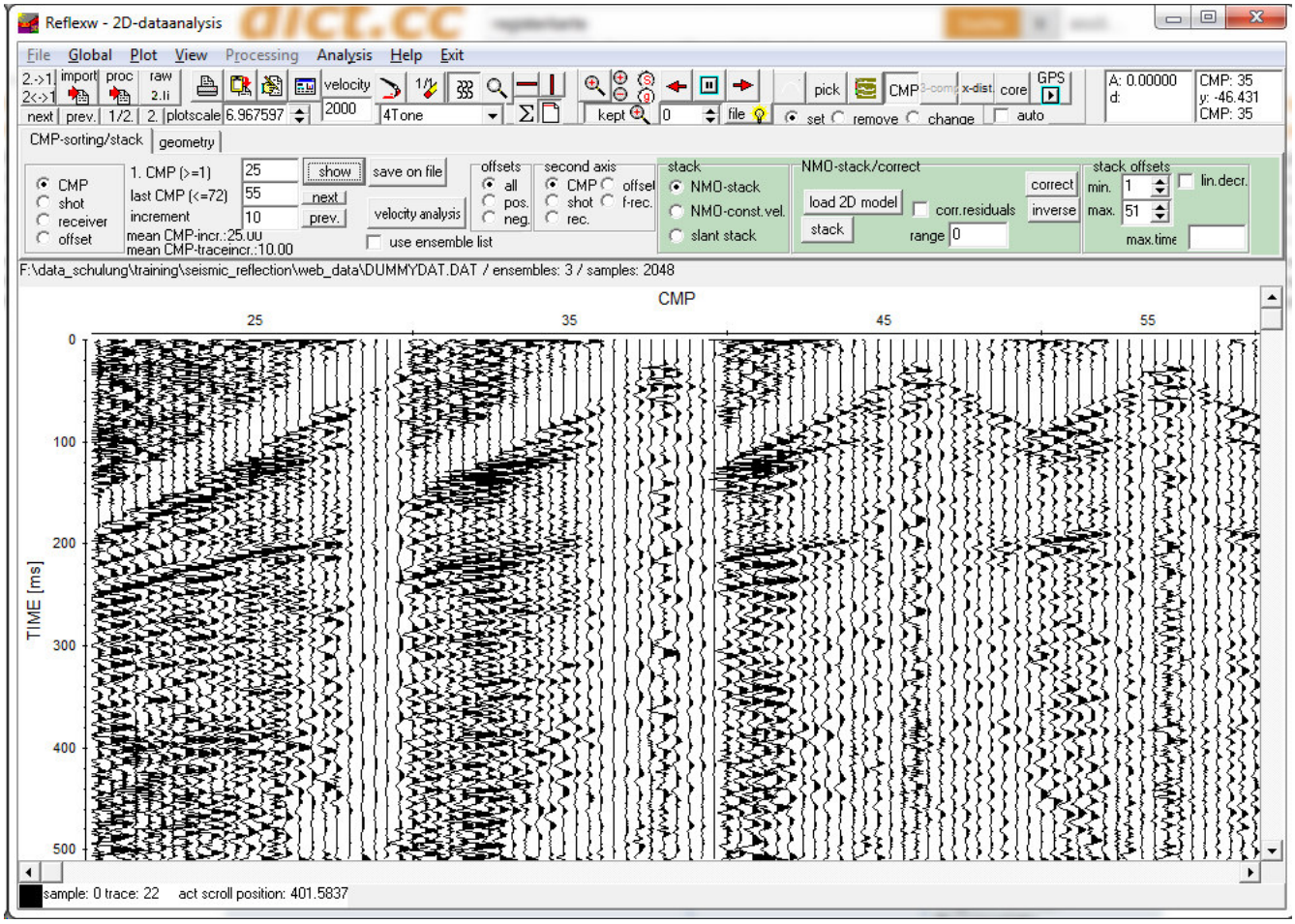


Optionally an **AGC** might be useful in order to increase the amplitudes of the weak reflections especially within the near shot range.

line1___05t -> line1___06t

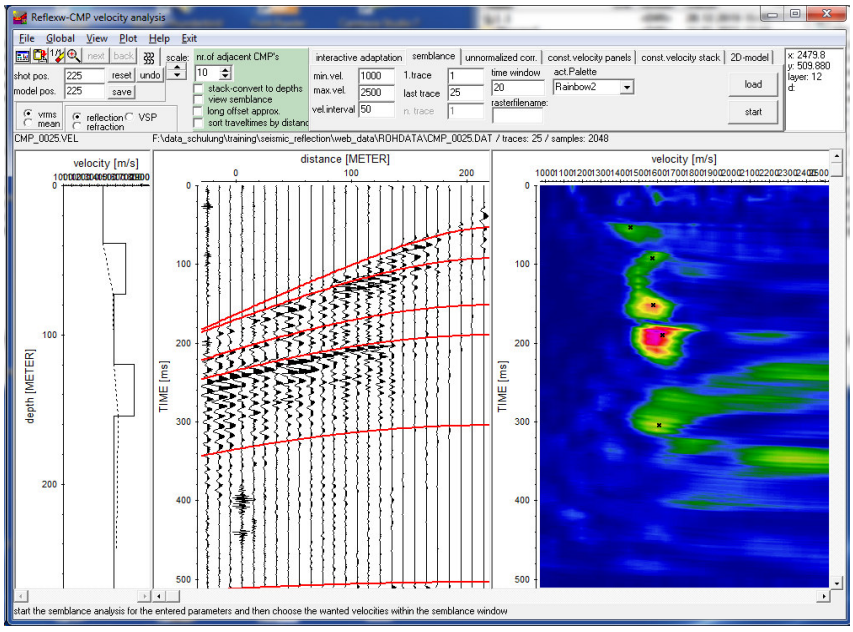
4. Velocity analysis

For the velocity analysis the CMP-menu will be entered again using the tab control CMP-sorting/stack. The velocity analysis may be done based on a number of CMP's as shown within the lower picture.

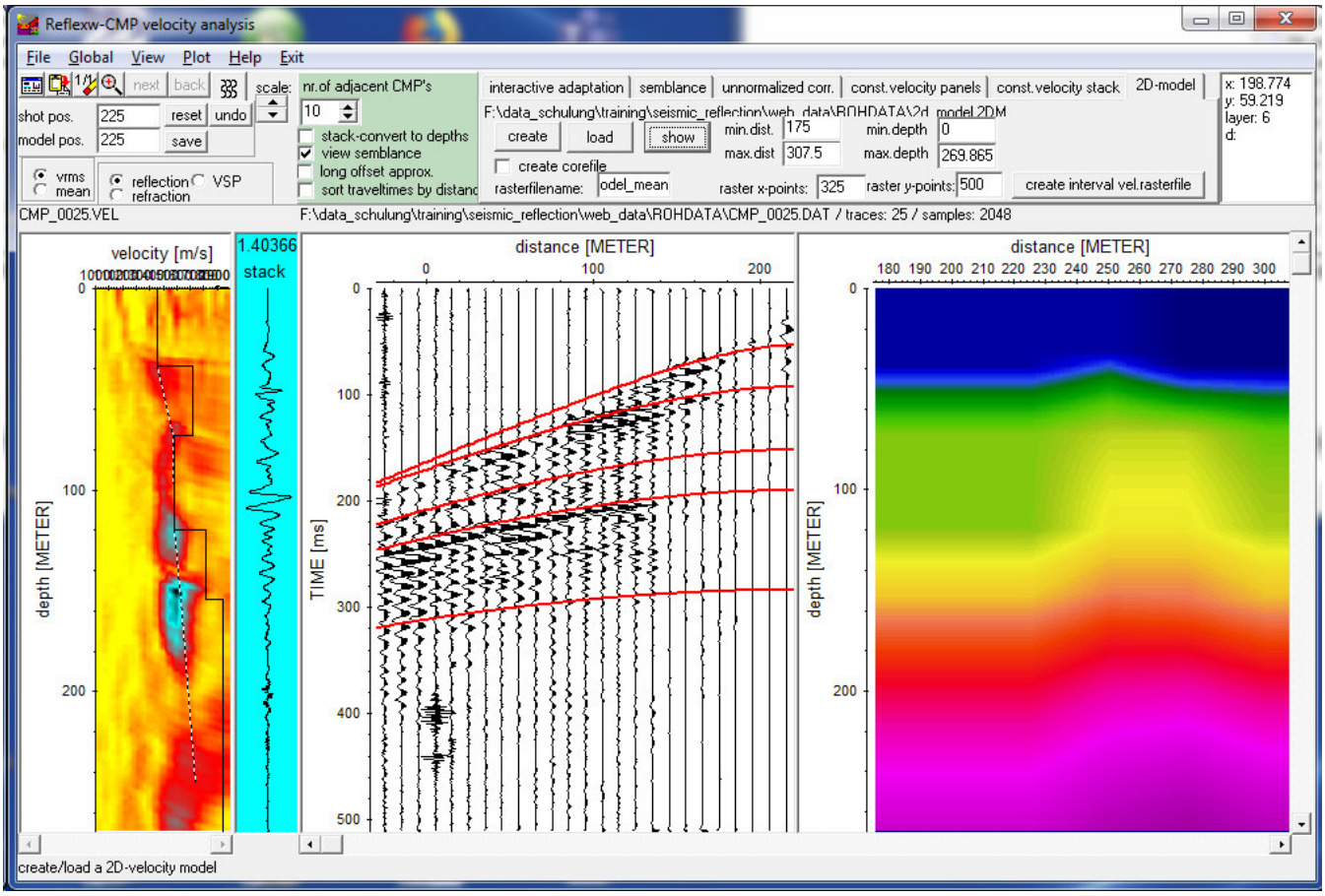


After having clicked on velocity analysis the CMP velocity analysis menu opens which allows an interactive velocity adaptation based on different methods like semblance, unnmormalized correlation or manual interactive adaption.

This must be done for all wanted CMP's.



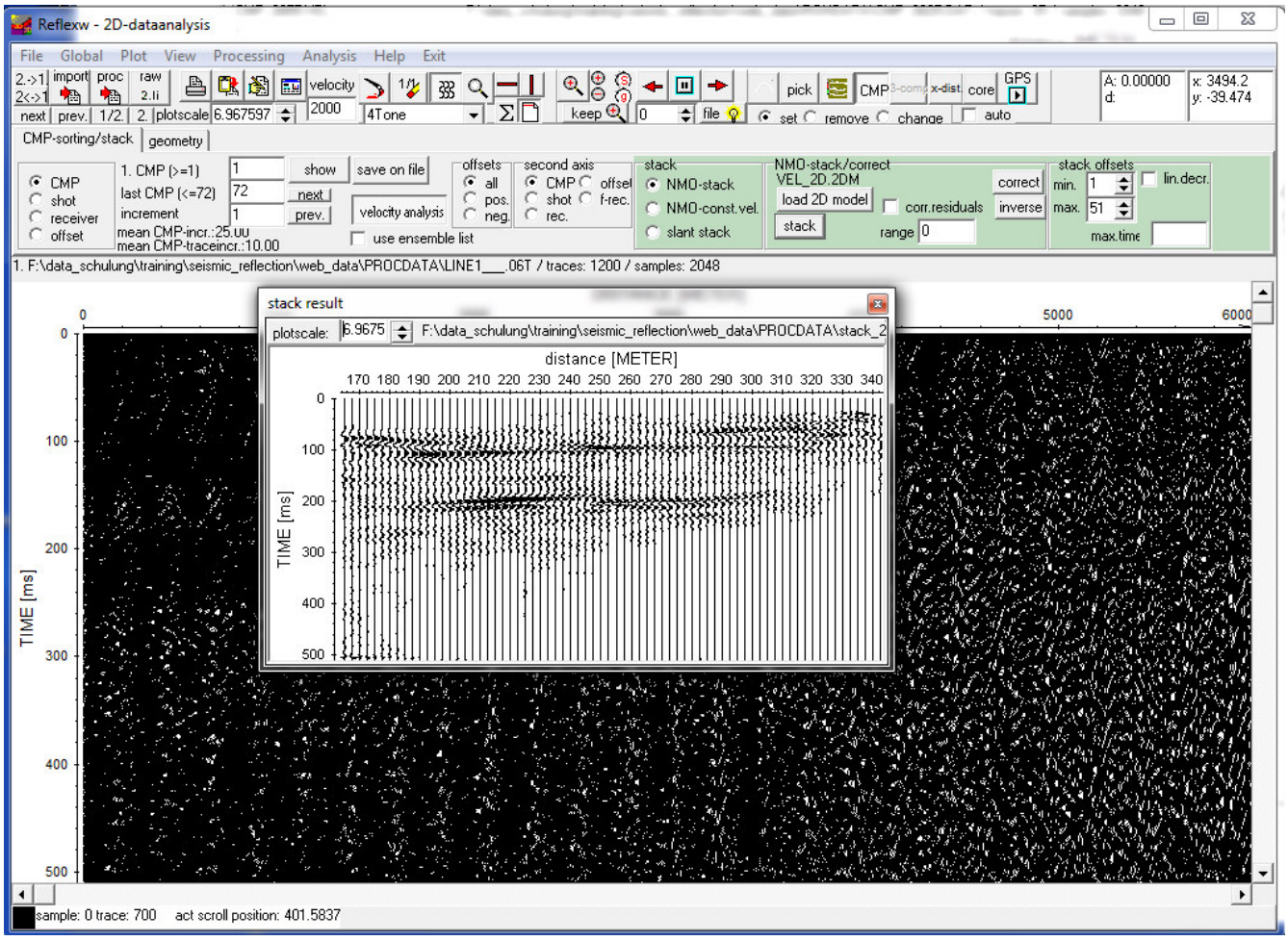
The option 2D-model allows to generate a 2D-Moel from the derived 1D-models.



Stacking

Stacking may be done based on the derived 2D-velocity model, on a constant velocity on based on a velocity range (slant stack).

Stack based on the 2d-model -> stack_model2d
Stack based on slant stack between 1500 and 2500 m/s with an interval of 100 m/s -> stack_slantstack



The stacked time depth converted section may be plotted together with the used 2D-velocity distribution (created within the 2D-model option when entering a corresponding rasterfilename, here 2d_model_mean). For this purpose load the stacked timedepth converted section as the primay and the velocity model as the seondary file and activate always each file and overlay within the plotoptions. It might be necessary to adapt the plotoptions of the two files before.