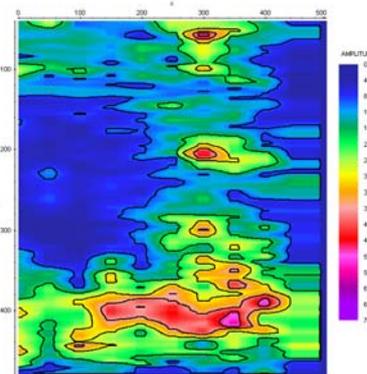


Main news of the REFLEXW version 5.0

I. 2D-dataanalysis

1. display

plotoptions: new option **isolines:** This option allows to plot isolines in addition. The option is only available for the pointmode within the 2D-dataanalysis, the 3D-datainterpretation and the modelling module. For the example on the right an increment of 100 and bold black symbol font was used. The min./max amplitude values were fixed to 0 and 700 respectively.



New option **show cursor in 2. window** under view - shows the actual cursor position within the secondary profiles using the settings of the symbol font.

New speedbutton  which allows to easily switch between pointmode and wigglemode.

The **plotscale** value can be changed using the < and > keys. The step size of 20 % corresponds to the step size of the plotscale up/down arrows. The keys cannot be used if the interactive velocity analysis is activated as in this case the keys are used for changing the adaptation parameters.

Plotoption **pointmode** - now the option **traceheader distancies** is also available for the pointmode. With the option traceheader distancies activated non equidistant data are plotted based on the traceheader distancies. The filling size for the pointmode will be automatically determined.

printing:

- now the plotoption **always each file** also holds true for printing more than 1 profile.
- printing with **overlaid** profile now possible.

2. dataimport

New import format **PS3-Sonne** which allows to import the data form the Parasound system.

New option **swap header** for **SEG2**-data which allows to only swap the SEG2-header values and not the datavalues and vice versa.

New option **time resampling** for **SEG2**-data. The option allows to import only every n. sample. The option might be useful if the original number of samples exceeds the max. samplenummer of 65000. Of course the aliasing criterium must be fullfilled if a value greater than 1 will be entered.

The traceheader timedelays are now loaded from **SEG2**-data. If **read starttime** has been activated the overall starttime of the fileheader is determined from the min. value of all existing individual time delay values for both **SEG2**- and **SEG2**-data.

New conversion sequence **geometry filelist** - the main geometrical data of the files to be converted are read from an additional ASCII-file (name GEOMETRY.*). In contrast to the option geometry file all files listed within the ASCII-file will be imported even if these are listed twice or still even more. No further choosing is necessary.

3. dataprocessing

shaping: new option under processing/1D-filter which allows to convert the characteristic waveform of the profile to a new desired one. The new wanted waveform must exist within an independent Reflexw datafile. After having chosen this desired waveform file the characteristic input wavelet must be defined by the selection of a trace/time given by the filter parameters. This trace window is shown in the reference trace window. The first filter parameter specifies the start time (**start ref.time**) and the second one the end time (**end ref.time**). The third parameter gives the start distance range (**start ref.distance**) and the fourth one the end distance range (**end ref.distance**). Over the selected traces an automatic averaging is performed for each selected time value. The selected trace/time range can be for example the area of the first arrival.

The amplitudes of the desired and the characteristic waveform should be in the same order.

The two chosen wavelets may contain zero value at the begin and at the end. Inserting zero values may reduce the effect of filter induced precursors. The following two pictures (point and wiggle mode) show an example. On the left panel the original data are shown. The middle panel shows the result using a desired wavelet containing zero values at the end (see also picture above) and the left panel shows the result using the same desired wavelet but without zero value.

A small phase shift may occur. Therefore a possible static correction should be performed after the shaping filter.

The shaping filter can be used for example to reduce the length of the waveforms (e.g. due to reverberations).

extract wavelet: new option under processing/1D-filter which allows to extract a characteristic wavelet from the actual profile.

crosscorrelation: new suboption keep reference trace and the filter now also works within frequency domain which requires much less computation time.

resampling: new groupbox working range - specifies whether the resampling is done within the timerange or within the frequency range. When using the timerange a linear interpolation is done between the datapoints. Using the frequencyrange the individual shape of the wavelets is taken into account more accurately.

normalize profiles: new processing step under processing/Gain. This processing step is designed for an energy equalization of different 2D-profiles. The processing step is only useful within the sequence processing for several profiles. If used for a single profile within the gain-menu no effect is given. The option is useful to compensate different coupling conditions, e.g. if an antenna array has been used for acquiring parallel 2D-lines.

Two different normalization methods can be chosen:

constant normalizing factor: one single scaling factor for each profile will be calculated from the quotient of the overall mean energy value of all profiles and the total energy value of the individual profile. The mean energy values will be determined within the given timewindow (options **start window** and **end window**). The option does not change the energy distribution within one single profile but only equalizes the total energy distribution between the chosen profiles.

time-dependent normalizing curve: a timedependent scaling curve will be calculated for each profile depending on the overall mean envelope curve of all profiles and the mean envelope curve of the individual profile. The envelope curves will be determined over the total timerange and summed up over all traces. Then this mean envelope (energy) curve will be smoothed over the given timerange (option **smooth range**). The option changes the energy distribution with respect to the timeaxis. For example: if a high reflection energy area exists within a special timerange for only few profiles the processing step will lower the energy within this timerange for these profiles.

The option might be reasonably employed if e.g. calculated timeslices show distinct stripe patterns which indicate different coupling conditions. In contrast to the option `compensate stripes` (chap. 1.11.2.10) which acts on the timeslices itself the filter `normalize profiles` acts on the profile data and not on the timeslices. The new timeslices or the 3D-datafile must be generated afterwards.

normalize 3D-file: new processing under `processing/Gain`. This processing step is designed for an energy equalization of a 3D-file. The option is useful to compensate different coupling conditions, e.g. if an antenna array has been used for acquiring the 3D-datafile.

Two different normalization methods can be chosen:

constant normalizing factor: one single scaling factor will be calculated for each 2D-ensemble of the 3D-file from the quotient of the overall mean energy value of the 3D-datafile and the total energy value of the individual 2D-ensemble. The option corresponds to the option `manual gain(x)` with suboption `get factors` for 3D-file (chap. 1.11.2.7). The mean energy values will be determined within the given timewindow (options **start window** and **end window**). The option does not change the energy distribution within one single ensemble but only equalizes the total energy distribution between the chosen profiles.

time-dependent normalizing curve: a time-dependent scaling curve will be calculated for each 2D-ensemble of the 3D-file depending on the overall mean envelope curve of the complete 3D-file and the mean envelope curve of the individual 2D-ensemble. The envelope curves will be determined over the total timerange and summed up over all traces. Then this mean envelope (energy) curve will be smoothed over the given timerange (option **smooth range**).

dilation xy-filter and **erosion xy-filter:** new processing options under `processing/2D-filter`. Dilation and erosion are morphology-based operations. Dilation, in general, causes objects to dilate or grow in size but also a hole fitting will be observed. The filters are mainly useful for the display of slices.

static correction: new option `load trace delays` - allows to read the traceheader time delay values into the static correction tabella. This option is useful in combination with the suboption `move to positive times`. New option **update tracedelays** - if deactivated the original delay times stored within the individual traceheaders will not be changed. This might be useful in order to reconstruct the original data (e.g. static correction/move to positive times and afterwards static correction/move to negative times both based on the traceheader delaytimes).

make equidist. traces: new option **no interpolation** which controls how the new traces will be generated:

With the option **no interpolation deactivated** the program searches for each new distance point the next traces at the right and the left and performs a linear interpolation between these two traces unless one of the two trace header positions exactly match the new one.

With the option **no interpolation activated** a new parameter **bin for stacking** must be entered. The program performs a horizontal stacking over all traces which lay within the bin range around each new distance point. If no traces are present within this range around one distance point the new trace only contains zero values.

New option **use tracedelays** - if activated the individual traces are shifted based on the given traceheader delaytimes for the internal interpolation or stacking process. This may be useful if the data had not been corrected before for the individual trace timedelays.

Muting: editing of the muting curve improved

4. traceheader menu and tabella

new option **time delay** - the traceheader timedelays which have been loaded from SEG-Y- or SEG2-data if read starttime has been activated. The overall starttime of the fileheader is determined from the min. value of all existing individual time delay values.

New options distance markers and comment markers for **creating 3D-ensembles** within the traceheader menu.

New option **check rec.coordinates** within the traceheader tabella - checks the receiver coordinates for breakouts and interpolates these. For that purpose the two x and y mean absolute differences between successive xy-receiver positions are calculated. If the absolute difference between two successive xy-receivers positions multiplied by the value of the option factor f.check exceeds one of the two mean difference value an interpolation for both the xy-shot and receiver coordinates is done for this xy-position.

5. Layershow

new option **view 1.-4.** - allows to view up to 4 different layershows. The scaling (x and z) is the same for all 4 layershows. No zooming or scrolling is possible. After having pressed the replot or reset button the original data will be displayed.

6. CMP-processing

New **stack** option **NMO constant vel.** which allows the NMO stack based on a given constant velocity.

II. 3D-datainterpretation

scroll mode: new options **median filter**, **dilation/erosion filter**. The median filter smooths smallscale heterogeneities but preserves edges.

Dilation and erosion are morphology-based operations. Dilation, in general, causes objects to dilate or grow in size but also a hole fitting will be observed. Erosion causes objects to shrink. The combination of both has a similar effect like the median filter.

The filter size must be entered. 3*3 disk includes 5 points, 3*3 square 9 points and 5*5 disk 13 points.

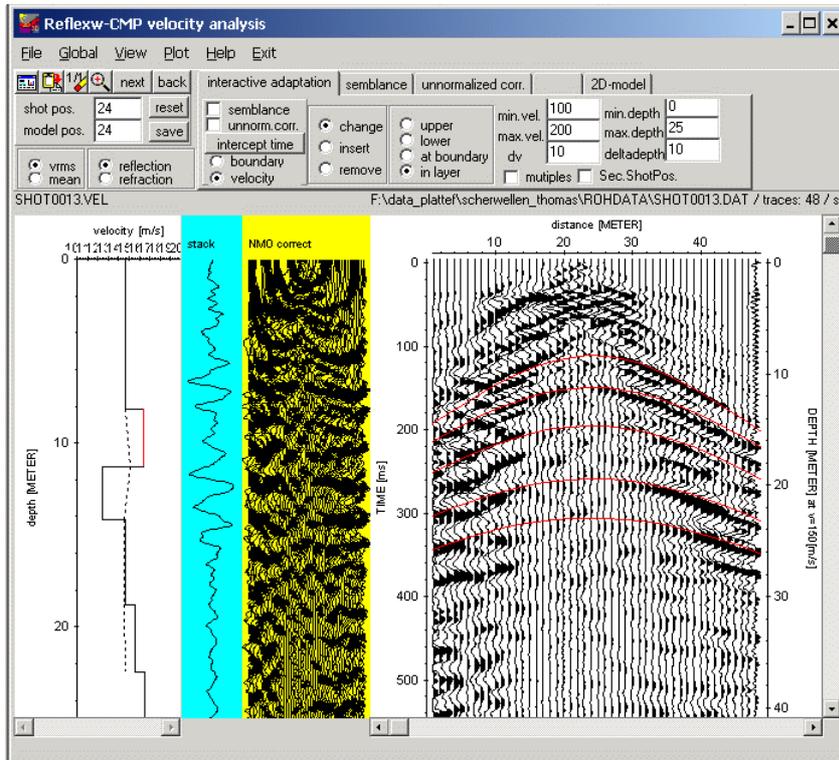
The filters are useful for the display of slices.

These filters are also available within the 2D-datainterpretation under 2D-filter.

view: new option **model contours** - allows to load a modelfile and shows the contours of the individual layers. The option is only available if a 3D-datafile has been loaded and is only active when displaying snapshots or timeslices. The option is useful for an easier interpretation of the snapshots of a finite difference wavepropagation simulation.

III. CMP velocity analysis

new option **NMO corrected ensemble** under View: If activated the NMO corrected section based on the actual 1D-velocity model is plotted in an additional window.



IV modelling

New option **create several lines file** under FD and Ray which allows to generate an ASCII-file which is necessary when choosing the option several single lines or several shots.

The coverage for the option **adapt reflector** has been included as a grayscale bar at the bottom of the model.