

# Main news of the REFLEXW version 8.5 from 01.05.2017

## 0. General

The handling of the automatic resizing of the menus has been improved when starting the program.

## I. 2D-dataanalysis

New speed buttons for a fast access to the data:



The left button changes according to the last settings to caption import: enter Import Menu, caption raw: open REFLEX raw data

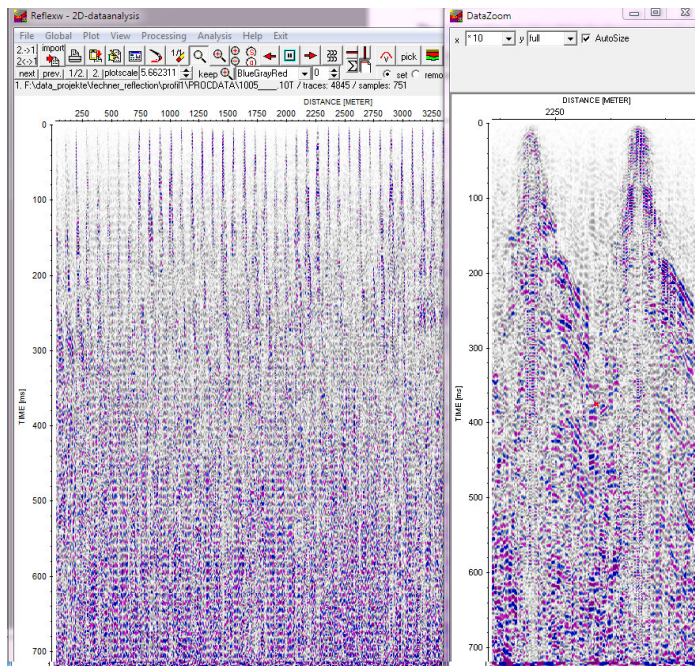
The middle button changes according to the last settings to caption proc and caption procf

The right button changes according to the last settings to caption raw 2.li, caption proc 2.li and caption procf 2.li

The **autoscroll** option may also be used in order to pass through all files of a project. Activate the option file for this purpose and enter a useful delay value (in ms)..



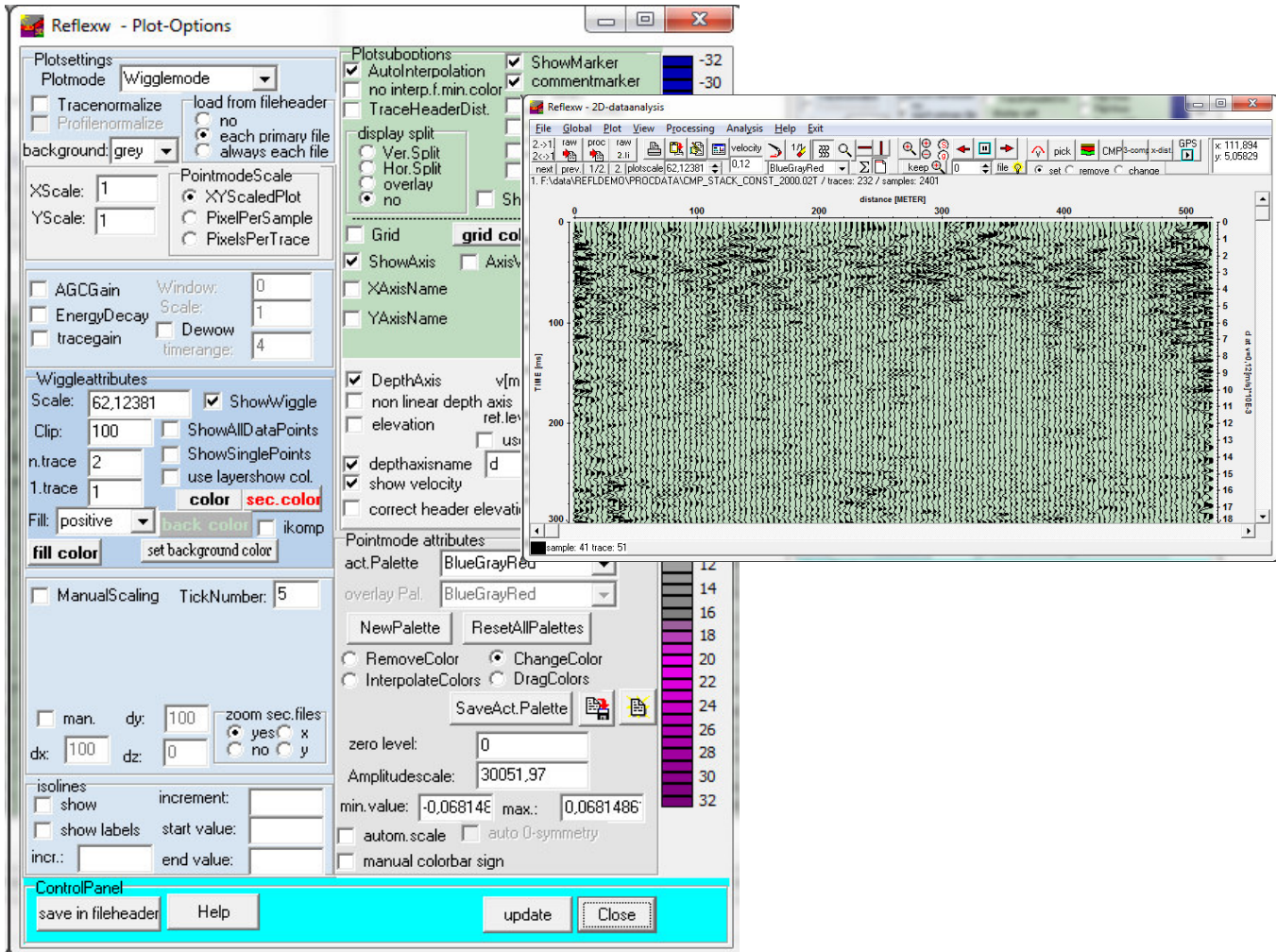
**Glass function:** option has been improved. Now the zoomed display will be completely renewed with high resolution when moving the mouse. The zoom factors in x- and y-direction are independently definable. With the option **AutoSize** activated the vertical size of the zoom window will be automatically adapted to the size of the time axis of the original profile



## 1.plot options

New option **Update** within the plotoptions menu. Allows to check the new plotoption without leaving the plotoption menu.

New option **background** which allows to set the background color for the 2D-dataanalysis and the 3D-datainterpretation. Four predefined colors are available - white, green, blue and grey. The option **set background color** allows to set the wiggle background color to the overall background color.



New option **only slices** for the 3D-datainterpretation - if activated the activated FlipYAxis option only acts on the slices.

## **2. Dataprocessing:**

**FD-migration:** now the FD-migration may also be based on a **rasterfile** containing the layer velocities.

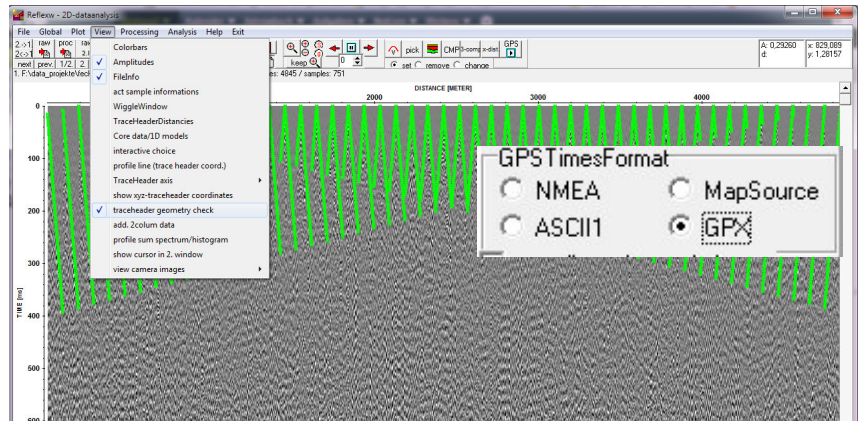
**Trace normalize:** new option under gain which allows an energy normalization of all traces.

The **reference trace** for several processing steps like e.g. gain function, background removal, ... may be saved under a freely choosable name using the Reflexw format.

**Background removal** and **sub. average:** new parameter **samples** within the taper width window allows to enter the number of samples for tapering the time start and end.

### 3. View:

**Traceheader geometry check:** new option which allows to view the shot-receiver geometry. The actual velocity within the plotoptions is used in order to define the traveltimes between shot and receiver used for the display. The option is useful in order to check the geometry of a dataset consisting of several shots, e.g. a seismic reflection profile.



**profile line (trace header coord.):** New option **z-coord. as sec.coor.** - if activated the secondary coordinate is assumed to be the z-coordinate, if deactivated the y-coordinate is used.

### 4.interactive velocity adaptation

New option **view on 2. line** which allows to show the marked adaptation on the secondary line.

New option **save vel, 2dm-files** within the global settings menu for the core adaptation. If activated both a vel-datafile for each core and a 2dm-data file for all cores will be automatically generated when saving the cores. The filename is taken from the original datafile name including an extension for the vel-data example for 10 cores and original datafile data\_wheel.01t: -> data\_wheel\_001.vel ... data\_wheel\_010.vel and data\_wheel.2dm. These files are identical to the files when created within the CMP-velocity analysis menu and may be used there or for a subsequent migration, time depth conversin, ....

### 5. traceheader menu

Option **PULSEKKO-GPS**: now also the gps-dta from the gp2-files are supported.

**GPS-times:** new format **GPX**.

The format **GPX** analyses the trkpt string of the following form:

```
<trkpt lat="47.1052278858" lon="12.7156866621"> <ele>2932.64</ele>  
<time>2016-09-14T06:58:33Z</time></trkpt>
```

The gpx-format is automatically used within the edit several lines as well within the import menu if no gps-file is available.



## 6. traceheader tabella menu

New option **coordinate transformation** which allows to perform the following transformations:

UTM-conversion

UTM-degree conversion

plane projective transformation

The **plane projective transformation** allows the transformation of the original coordinates into another coordinate system using four pairs of transformation coordinates. This transformation allows you for example to use a local coordinate system and to transform these coordinates into UTM-coordinates (example shows data from a 24 channel GPR antenna array - in total 7 different arrays).

coordinate transformation

TransformationRadioGroup1

☐ UTM-conversion

☐ UTM degree conversion

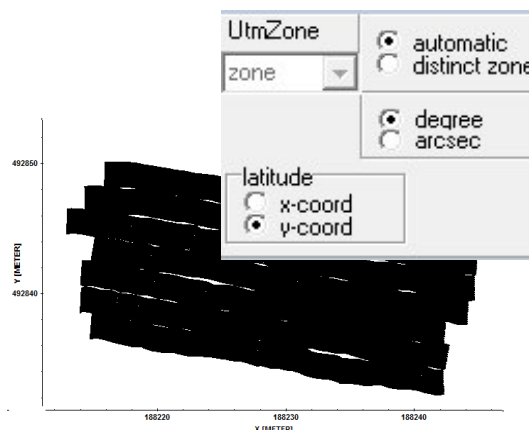
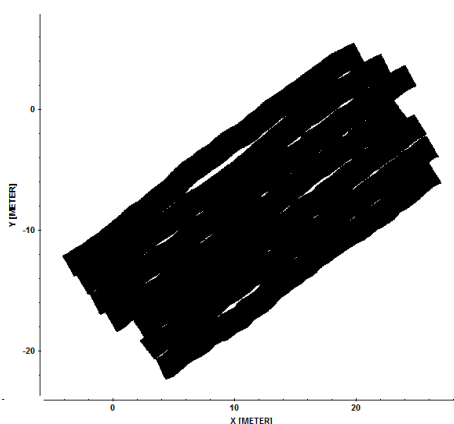
☒ plane projective transformation

plane projective transformation

x-in	y-in	x-out	y-out
-5.37	-12.32	188246.43	492845.58
6.42	-16.26	188237.7	492836.74
17.870001	-5.16	188222.47	492841.46
17.99	5.85	188217.38	492851.22

load 4 pairs of points

start



New option **multiply by value** for editing the values from a special column: allows to multiply by a constant value for all data of the currently chosen column.

**View rec.geometry:** New option **z-coord. as sec.coor.** - if activated the secondary coordinate is assumed to be the z-coordinate, if deactivated the y-coordinate is used.

## **7. Edit several Fileheaders:**

New option **read from one file** for WSKTRANS-GPS - if activated one single gps-file will be queried and used for all chosen original datafiles. The option might be useful for the simultaneous import of the data of one antenna array with one single GPS-unit and using the option correct for offset together with activated option offsets from file for a correction of the gps-coordinates based on the array configuration. The option is also available within the import menu.

**GPS-times:** automatic control if a gpx-file exists instead of a gps-file.

## **8. Pick:**

PickGroupBox (option add.options): new option **set pick code to all** - allows to set the actual code for all actually existing picks.

Now the actual velocity will be saved with each pick.

### **Save picks:**

Now also the **elevations** may be stored using the formats ASCII-free format and ASCII kml file. With the option apply ind.pick elevations activated the elevations of the picks are determined from the difference of the pick z-receiver coordinates and the picked traveltimes converted in depths. Otherwise the overall ref.level will be used in order to determine the elevations from the depths.

## **9. Dataimport:**

New import format **SEG-Y-PRISM**: This is a modified SEG-Y-format for data from the Prism software from Radar Systems Inc.

**IDS-data:** new option **16 bit data** - if activated the original IDS-data are assumed to be 16 bit data, if deactivated the data are assumed to be 32 bit data.

**RADAN-data:** now the dzx-file associated with the dzt-file will be searched for user markers. If a WayPt of the following form is present within the dzx-file user marks will be found.

```
<WayPt>
  <scan>1030</scan>
  <mark>User</mark>
  <name>Mark1</name>
</WayPt>
```

**WSKTRANS-GPS:** New option **read from one file** - see Edit several Fileheaders chapter.

Now the options **UTM-conversion** and **calculate distancies** are always enabled. You may use these options if the original dta already contains GPS-data without the need of a synchronization with an external GPS-file.

Update traceheader based on **GPS-times:** automatic control if a gpx-file exists instead of a gps-file.

## 10. Dataexport:

New option **ASCII-5COLUMNS**: exports the data in the format: traceheader receiver x-coordinate, y-coordinate, z-coordinate, time and amplitude.

**Bitmap** export: If the number of traces or the number of samples exceeds 32760 the option autointerpolation will be automatically activated in further versions a blank image appears with deactivated option).

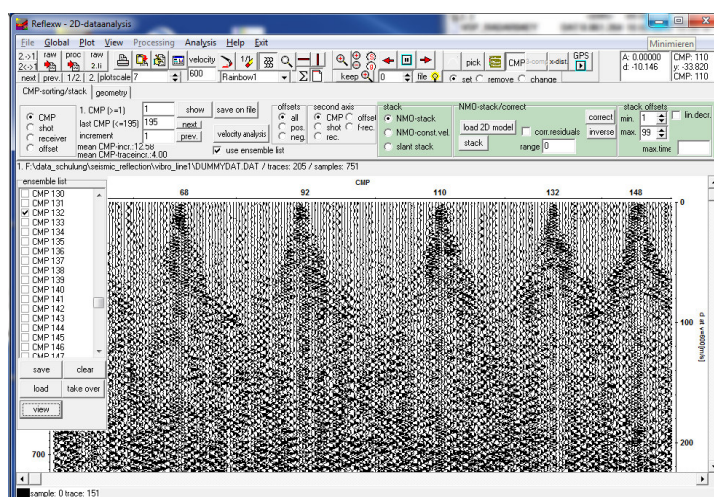
**ASCII-3D\_DATA**: New depths groupbox containing the possibility of output the depths or the altitudes which are calculated based on a reference level and the depths.

## 11. CMP processing:

**CMP-bin**: The handling of big CMP-bin's (so called super-gathers) has been improved.

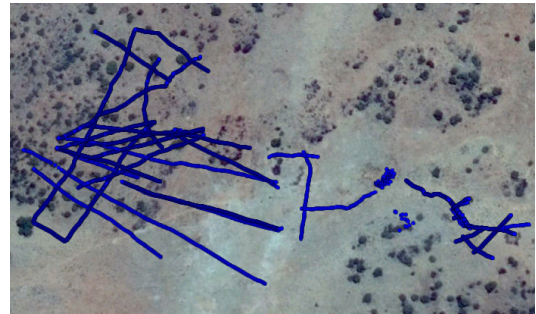
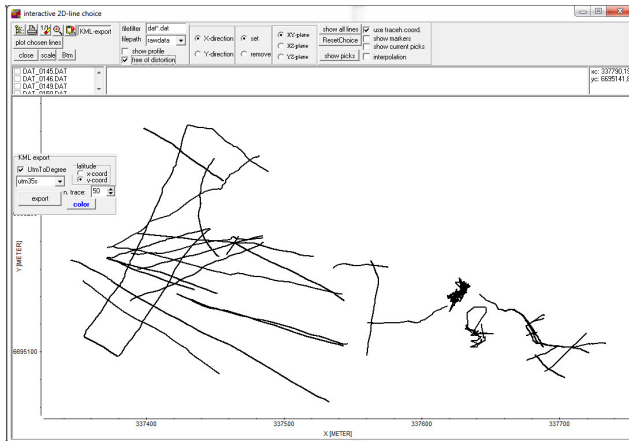
**NMO-stack/correct**: New option **max.time** for the linear decrease of the max. offsets.

new option **use ensemble list**: if activated it is possible to define the wanted ensemble within a list. Click within the list on any ensemble you want to display and which shall be used for the further velocity analysis. It is possible to **save** the actual list and to **load** it. One list will be saved for each project directory. **Take over** allows to take over the actual settings within the min./max.number parameters into the list. **View** allows to display the ensembles activated within the list. The options show, next and prev. always act on the min./max number parameters. This allows a fast setting of the wanted ensembles within the list.



## 12. Interactive choice:

New option **KML export**: allows to export the profile line coordinates to a kml file which may be loaded afterwards by e.g. GoogleEarth. The color may be defined as well as the number of icons (n.trace). The option **UTMToDegree** allows to convert UTM-coordinates to degree values based on a given utm zone.





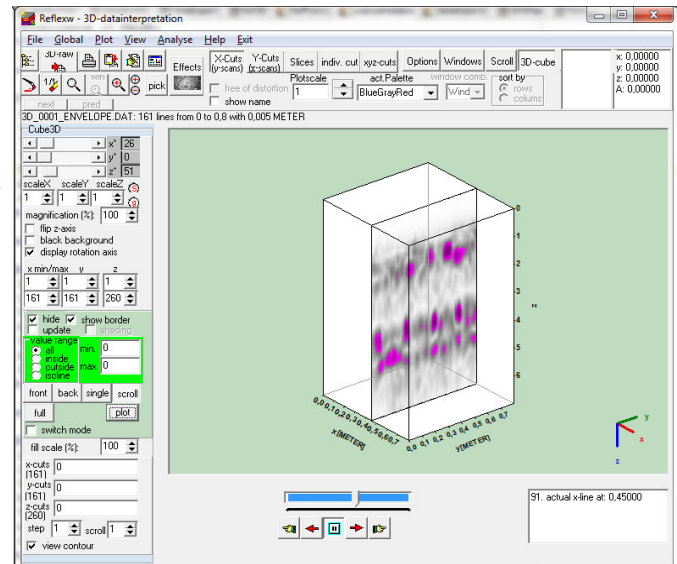
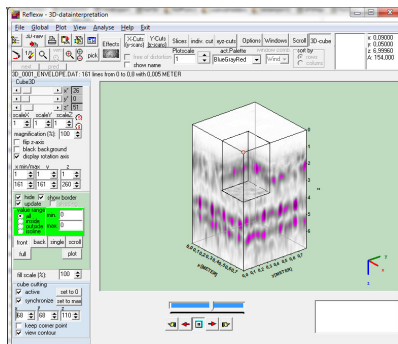
## II.3D-datainterpretation

The display of the the act cut name (option **show name** activated) has been improved.

**Full 3D-Plot:** new option **use envelope data** - if activated the envelope data are used for the full display in the case of “envelope timeslices only” used within the Ref3DProcessingForm. If deactivated the “normal” data are used.

New option **view contour** for the scroll and single 3D-cube mode. The option allows to view the contours of the individuals slices.

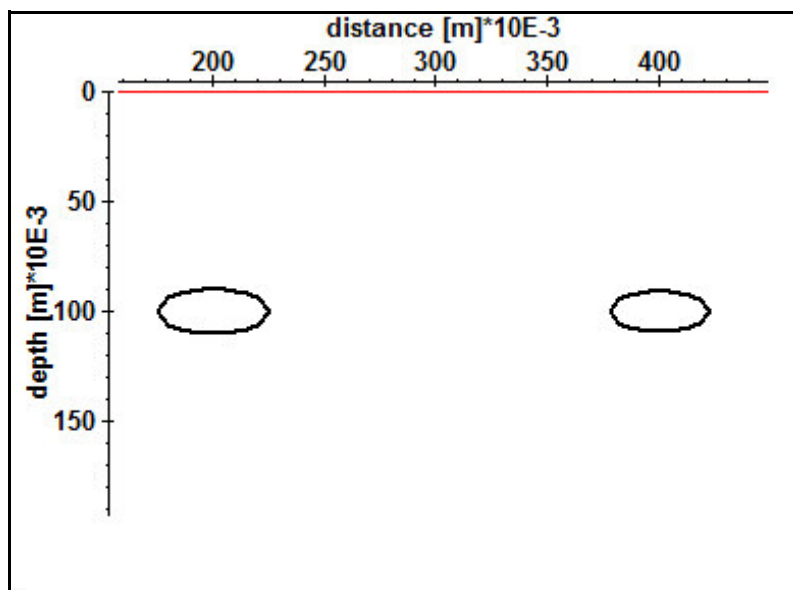
A similar option has been included for the front and back cube cutting feature.



The background color may be changed within the plotoptions.

### III. modelling

new option **lens** which allows to add lenses. The semi-major and semi-minor axis lengths may be given.



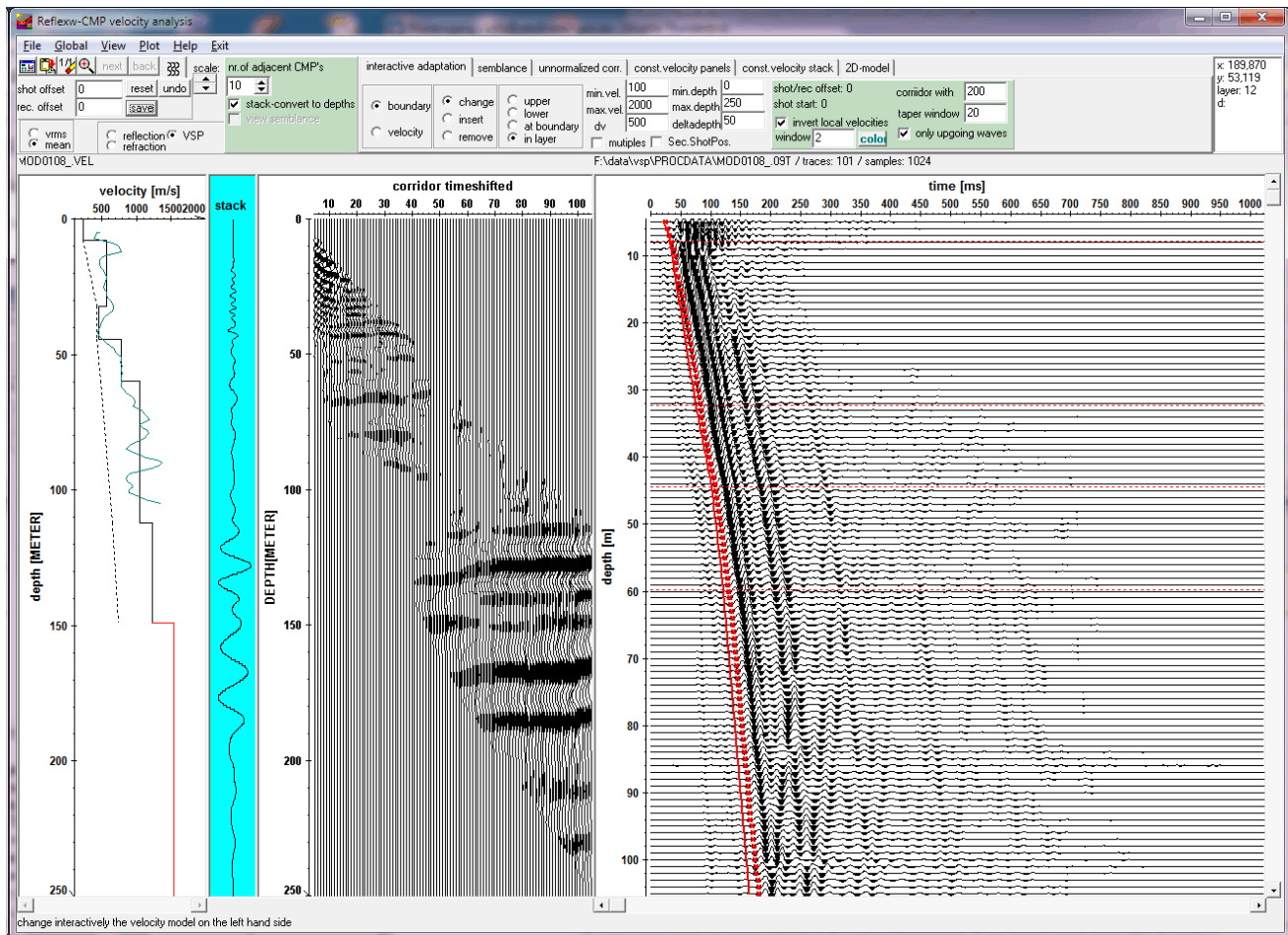
**raytracing** for **data traveltimes**: improved for borehole sorted data with the second coordinates stored on the z-positions.

**FD-raytracing and tomography**: now double precision is used instead of single precision which allows a smaller increment for very large coordinates (e.g. UTM-coordinates).

## IV. CMP velocity analysis

New options have been included for the VSP and reflection data.

### VSP-data:



New option for a **corridor stack** of the **VSP-data** if the option view/nmo corrected ensemble and/or StackTrace is activated. The option allows the dynamic correction and stacking of the reflections of a vertical seismic profile (VSP). The result is a time-shifted two-way arrival times (at the surface) section. This corridor timeshifted section will be displayed with the timeaxis as the vertical axis.

The timeshift is done based on the first arrival timeshift over the **corridor width** given in the timedimension. The first arrivals used are calculated from the receiver positions and the actual 1D-velocity distribution. The data are muted above the first arrivals and below the time beginning at the first arrival time plus the corridor width. A taper may be applied around the first arrivals (option **taper window**).

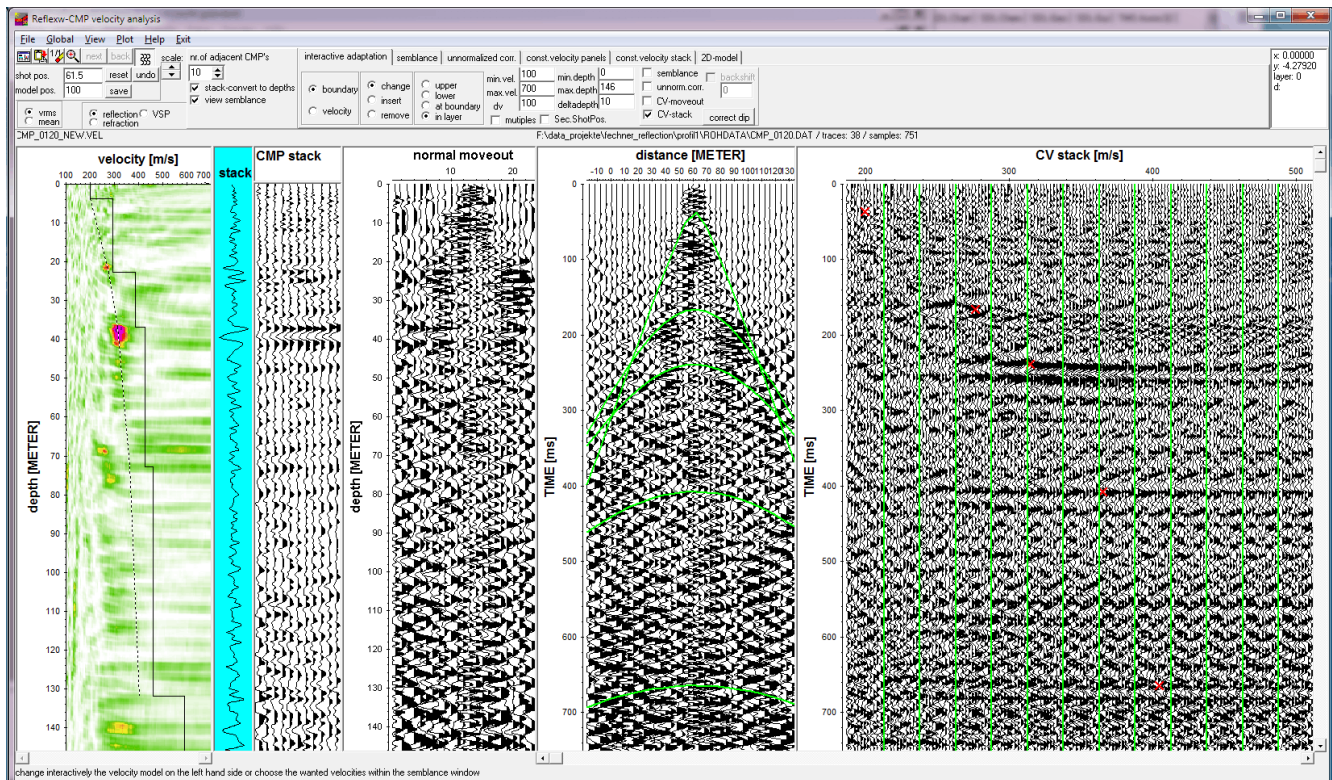
With the option **only upgoing waves** activated a fk-filtering will be done before the timeshift correction/stacking resulting in a section which only contains the upgoing wavefield.

The number of samples does not change. If the original data acquisition time is small and deeper reflections are present you may use the processing option time cut within the 2D-dataanalysis before in order to extend the timerange of the original profile.

The timeshifted data may be stacked and viewed as a stack trace (option view StackTrace activated) or only viewed (option view/nmo corrected ensemble activated).

The resulted stack trace as well as the timeshifted data may also be timedepth-converted using the option **stack convert to depths**. With this option activated a direct comparison of the 1D-model and the stacked /timeshifted traces are possible.

## Reflection data:



The interactive velocity adaptation of reflection data (single shots or CMP's) has been significantly extended.

The actual semblance or unnormalized correlation analysis (automatically converted into depth using the actual 1D-velocity model) may be plotted into the model using the option **view semblance**.

Two new analysis methods are available:

const. velocity panel (CV panel) and const. velocity stack (CV stack).

With the option **const. velocity panel** activated the NMO-correction is applied for the actual shot or CMP using different constant velocities. The results of the different velocities are displayed within the analysis window with each velocity separated by a vertical line and the velocity that results in a flattening of the hyperbolas corresponding to the velocity for a certain reflector. Analogous to the semblance analysis it is possible to interactively choose the wanted velocities.

With the option **const. velocity stack** activated the NMO-correction is carried out for several adjacent CMP gathers and the NMO-corrected data are stacked. The number of the adjacent CMP's is given by the option **nr. of adjacent CMP's**. The program automatically searches the files with identical extension and which are in the alphabetical neighbourhood (example loaded datafile is CMP00120.DAT and nr. of adjacent CMP's is 10 - the program searches for the previous 5 files in the left alphabetical neighbourhood, for example CMP00115.DAT to CMP00190.DAT and for the next 5 files in the left alphabetical neighbourhood, for example CMP00121.DAT to CMP00125.DAT). The files must have identical sample number, otherwise they will be ignored. Stacking velocities are picked directly from the constant velocity stack panel by choosing the velocity that yields the best stack response at a selected event.

Now it is also possible to change or remove adaptations within the analysis menus (semblance, .....). A continuous change with pressed mouse button is also supported.

The option **stack convert to depths** allows to automatically convert the stack trace (option view StackTrace activated) as well as the normal moveout data (option view/nmo corrected ensemble

activated) and the stack of the adjacent CMP's into depths. This may allow a more precise interactive definition of the layer depths.

The new option **adjacent CMP's stack traces** under view allows to display a CMP stack for the number of ensembles given by **nr. of adjacent CMP's**. The actual 1D-velocity distribution is used for the stack.