

Use of GPS-coordinates within REFLEXW

REFLEXW allows to handle so called traceheader coordinates which are stored within the header of each trace. Therefore it is possible to use GPS-coordinates for a special analysis.

1. Import the GPS-coordinates

First you must set the **traceheader coordinates** using the **GPS-coordinates**. For that purpose it is necessary that the GPS-coordinates are stored within an ASCII-file. Several different formats are supported. For example:

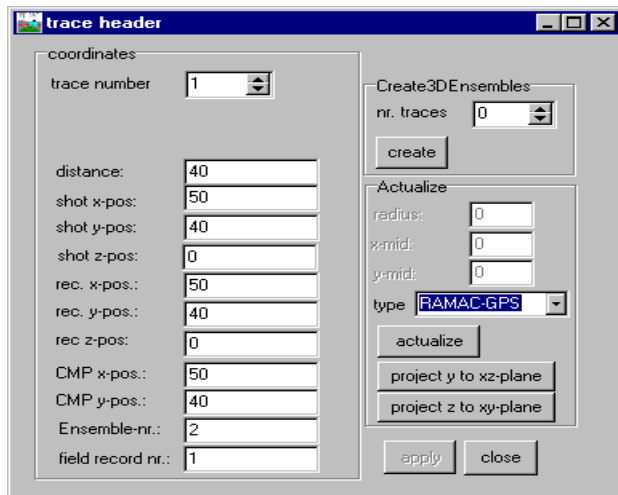
a. ASCII-DST format - each line contains the following informations:

tracenumber distance Shot-X-Pos Shot-Y receiver-X receiver-Y shot-Z(opt.) receiver-Z(opt.)

b. RAMAC GPS format (extension COR) - each line contains the following informations:

tracenumber,date,time,Northing,West,altitude,PDOP

The traceheader coordinates of REFLEXW are changed using one of these ASCII-formats within the **traceheader menu**. The traceheader menu is entered within the **fileheader menu** using the option **ShowTraceHeader**.



Within the **traceheader menu** you must choose either ASCII-file, ASCII-file/interpol. or RAMAC-GPS for type and then you must press the button actualize in order to actualize the traceheader coordinates. With the type “ASCII-file/interpol.” activated an automatic interpolation is done if for various traces no coordinate data are present within the ASCII-file. With the type “RAMAC-GPS” the program controls if there are consecutive identical coordinates in the *.cor file - these coordinates are automatically be replaced using an interpolation. The option “interpolation 0-data” allows the interpolation of those coordinates which have 0 values.

The option **calculate distancies** allows to update the traceheader distancies based on the x- and y-receiver traceheader coordinates. The start distance is taken from the fileheader but can be changed manually (option start distance).

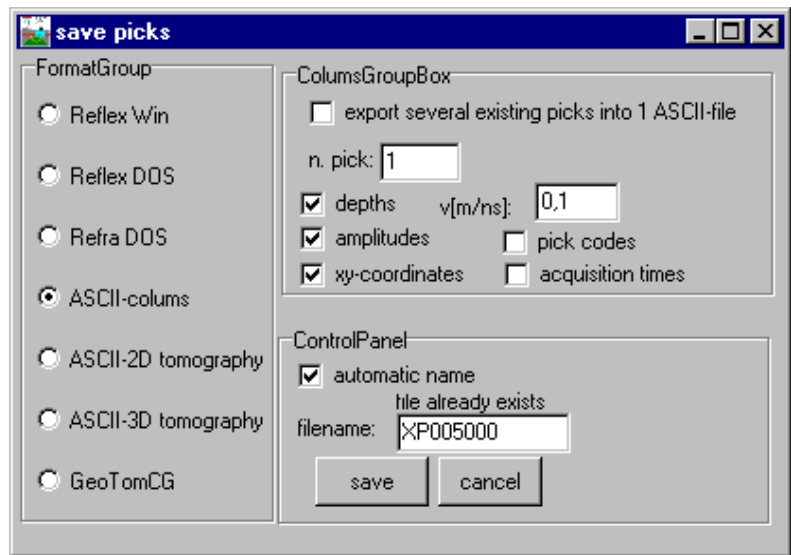
To be considered: The traceheader coordinates are stored either using a 32 bit floating format (Reflexw formats 16 bit integer and 32 bit floating point within the import menu) or using a 64 bit double precision format (Reflexw formats new 16 bit integer and new 32 bit floating point) - see also guide GPR_Import_Display or the specification within the manual concerning the Import format specification (chap. 1.5.4). If the coordinates have very high values with small changes, the data representation of the 32 bit floating format may not be good enough. In this case the Reflexw new format with the 64 bit double precision format must be used when importing the original data or a constant offset should be subtracted from the coordinates before storing them into the traceheaders.

2. Handle the traceheader(GPS)-coordinates

2.1 picking:

The traceheader coordinates can be used for **exporting picked data** to an ASCII-file. For that purpose you must activate the option **xy-coordinates** within the save pick menu (format: ASCII-columns). Each line of the ASCII-file contains the following values: coordinate in profiledirection(10:3), coordinate in profileconstant(10:3), x-traceheader-coordinate, y-traceheadercoordinate, travel time(12:6), depth(10:4), amplitude(10:2).

The ASCII-file has the extension PCK and will be stored in the path ASCII in the actual projectpath.



2.2. viewing options within the 2D-dataanalysis

Within the 2D-dataanalysis module there exist two different **viewing options** of the **traceheader xy-coordinates**.

First using the option **profile line (trace header coord.)** the profile location based on the traceheader coordinates is shown in an additional window (any curvature of the line coordinates is displayed). When moving the mouse cursor within the data window the actual xy-position of the mouse cursor is also shown.

Second with the option **TraceHeader axis** (from version 3.5) activated the xy-receiver traceheadercoordinates are displayed along the distance axis in addition.

The **traceheader z-coordinates** are used for the plotoption **correct header elevations** (from version 3.5). If activated the traces are shifted based on the receiver and the shot elevation values stored within the traceheader of each trace and the entered elevation level. The shift levels are calculated from the difference of the entered elevation level and the individual traceheader elevation values. Based on the actual velocity the travelttime shift value is calculated from the sum of the shot and the receiver elevation differences. The option is only enabled if the option elevation is activated.

The plotoption **TraceHeaderDistancies** allows to plot the profile based on the individual distancies stored in the single traceheaders and not based on the equal trace increment of the fileheader. The option is available both for the wiggle and point plotmode.

2.3 processing options

There exist several processing options which allow the use of the traceheader-coordinates. For example:

- a. **correct 3D-topography** under processing/static correction: With the suboption z-tracecoord activated the static correction is based on the shot and the receiver elevations stored within the traceheader of each trace. The option is available from Reflexw version 3.5.
- b. **make equidist. traces**: the option allows to interpolate non-equidistant data in such a way that the resulting data are equidistant. The precondition is that the true position of each trace is stored in the parameter distance within the individual trace header. If the distance is not defined you may do this within the traceheader menu using the option actualize and the type “calculate distancies” (from version 3.5).

2.4 3D-datainterpretation

It is possible to build up a 3D-datafile based on freely distributed 2D-lines whereby the individual positions of the traces are either taken from the fileheader or from the traceheader coordinates (see also guide 3D-dataintepretation, chap. I.2.2 Generating a 3D-file for freely distributed 2D-lines). With the sorting type “geophone coordinates” the xy-positions of each trace is taken from the xy-receiver traceheader coordinates.