

GPR-import and standard processing of 2D-data

1. Import

Data under folder gpr_2d_processing

1.1 import wheel data data_wheel.rd3

data are already equally spaced

1.2 import time based data including markers data_markers.rd3

The file data_markers.mrk will be automatically read during the import. The processing step markerinterp under traceinterp/resorting allows to generate equally spaced data.

1.3 import GPS based data data_gps.rd3

The file data_gps.cor containing the gps-coordinates will be automatically read during the import. In addition a utm-conversion will be done and the distances along the gps-line are calculated automatically. The processing step make equidist.traces under traceinterp/resorting allows to generate equally spaced data.

1.4 Meandering data acquisition

The file data_wheel_meandering.RD3 has been acquired in opposite direction. The file may be flipped directly during the import by entering a larger start coordinate than end coordinate. Another possibility is given by the processing option XflipProfile.

There are 3 parallel lines data_wheel_01.RD3, data_wheel_02.RD3 and data_wheel_03.RD3 which have been acquired in a meander-like way. The file data_wheel_02.rd3 has been acquired in opposite direction to the other 2 files. The flipping in profile direction may be done during the import using the conversion sequence parallel lines and activated option meandering.

The file data_gps_meandering.RD3 also has been acquired in opposite direction. The file must be flipped after having imported the gps-coordinates and after having made the data equally spaced using the processing option make equidist.traces. The optional flipping (only necessary for a better comparison of the different profiles) is done using the processing option XflipProfile under traceinterp/resorting.

2 Processing

2.1 Dewow or bandpassfiltering

data data_wheel.dat → extension 11: bandpassfiltering between 100 and 400 MHZ

A small precursor (negative amplitude) occurs.

2.2 Timezero

data data_wheel.01t → extension 02: correct max. phase between 11 and 15 ns, pos. polarity, zero cross., and auto correct time

The time zero has been done based on the first positive arrival (the first negative is an artefact due to the bandpassfiltering). All subsequent picking must also be done based on the first arrival of a reflection or diffraction.

Move starttime → extension 03

2.3 Time varying gain

data data_wheel.03t → extension 04: gain function with start at 10 ns, linear gain and exponent 1

2.4 Clutter reduction

data data_wheel.04t → extension 05: background removal starting at 10 ns in order to retain the first arrival

2.5 Migration

data data_wheel.05t → extension 06: fk-migration with a velocity of 0.1 m/ns

2.6 time-depth conversion

data data_wheel.06t → extension 07: time-depth conversion based on a constant velocity of 0.1 m/ns

2.7 topographic correction

data data_wheel.07t → extension 08: correct 3D-topography based on ASCII-file topo_distance.txt and a velocity of 0.1 m/ns and fileheader coord.

Sequence processing

Save sequence processing of file data_wheel.08t and remove the correct 3D-topography option.

Apply the sequence processing to the 3 parallel lines data_wheel_01.dat, data_wheel_02.dat and data_wheel_03.dat