

FD modelling of common offset data

In the following the simulation of common offset data using a Finite Difference approximation of the Maxwell equation or the elastic wave equation will be described.

The simulation must be done using different single shot simulations with only one receiver position which will be composed together to a common offset section at a later stage.

Enter the modelling menu and create your model.

- activate the option create several lines file and enter the moving line geometry
- the example shows a moving line with a constant offset of 1 m and the source starting at 0 (the receiver at 1 m) and ending at 50 m (the receiver end at 51 m)
- the option generate creates a file with the filename fdshots and a free extension containing the geometry for each shot and the Reflexw output filename
- set output type to several single lines within the output parameters panel
- start the FD calculation - the wanted fdshots file must be chosen

The top screenshot shows the 'model generation/modelling' software interface. The main window displays a plot of depth (m) versus distance (m). The plot shows a moving line geometry with a constant offset of 1 m. The source starts at 0 m and ends at 50 m. The receiver is at 1 m. The plot shows the moving line geometry with a constant offset of 1 m. The source starts at 0 m and ends at 50 m. The receiver is at 1 m.

The bottom screenshot shows the 'model generation/modelling' software interface. The main window displays a table of source positions. The table has 6 columns: source x, source z, source z start, source z end, source incl, and receiver x, receiver z start, receiver z end. The table is as follows:

source x	source z	source z start	source z end	source incl	receiver x	receiver z start	receiver z end
48.9000015	0.0000000	49.9000015	49.9000015	0.0000000	0.0000000	0.0000000	0.0000000
49.0000000	0.0000000	50.0000000	50.0000000	0.0000000	0.0000000	0.0000000	0.0000000
49.1000023	0.0000000	50.1000023	50.1000023	0.0000000	0.0000000	0.0000000	0.0000000
49.2000008	0.0000000	50.2000008	50.2000008	0.0000000	0.0000000	0.0000000	0.0000000
49.2999992	0.0000000	50.2999992	50.2999992	0.0000000	0.0000000	0.0000000	0.0000000
49.4000015	0.0000000	50.4000015	50.4000015	0.0000000	0.0000000	0.0000000	0.0000000
49.5000000	0.0000000	50.5000000	50.5000000	0.0000000	0.0000000	0.0000000	0.0000000
49.6000023	0.0000000	50.6000023	50.6000023	0.0000000	0.0000000	0.0000000	0.0000000
49.7000008	0.0000000	50.7000008	50.7000008	0.0000000	0.0000000	0.0000000	0.0000000
49.7999992	0.0000000	50.7999992	50.7999992	0.0000000	0.0000000	0.0000000	0.0000000
49.9000015	0.0000000	50.9000015	50.9000015	0.0000000	0.0000000	0.0000000	0.0000000
50.0000000	0.0000000	51.0000000	51.0000000	0.0000000	0.0000000	0.0000000	0.0000000

A 'Confirm' dialog box is shown in the center of the bottom screenshot, asking 'start the FD-calculations?' with 'Yes' and 'No' buttons.

For each source position one simulation will be performed resulting in one Reflexw file

Merging the different output files into one common offset file

- enter the 2D-dataanalysis
- load the first FD simulation output file
- enter the processing option merge files to be found under processing/edit traces
- load the other simulation files using the option load
- start the processing option merge files

As the original Reflexw FD output files only contain one trace the resulting file represents a common offset section. Enter the fileheader and change the data type to const. offset, enter the correct start and end coordinates if necessary and enter the correct S/R distance. Save the parameters.

