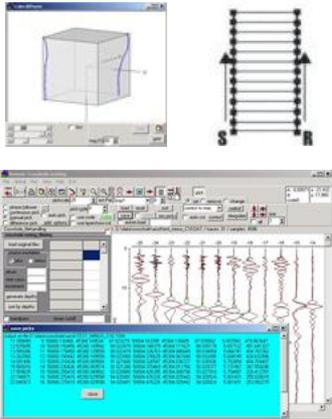


Overview of the Reflexw possibilities for the different borehole data types

crosshole Seismic Testing

2D-dataanalysis

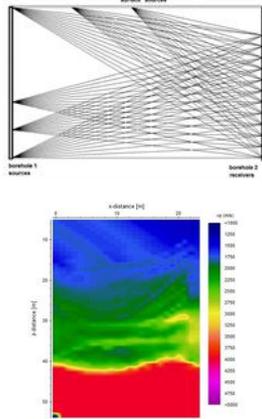
In this method, also known as **Crosshole Sonic Logging (CSL)**, the source (p- or s-wave source) and the receiver are located at the same depth within two separate boreholes. The traveltimes of the first arrivals are transformed into p- and or s-velocities which represent average values between the boreholes. A multi-directional receiver array is supported. The **deviation of the boreholes** (true xyz-coordinates) can be taken into account. The picking of the first arrivals can be done by different automatic methods or manually or by a combination of both. If a shear wave source with 2 different orientations has been used the raw data can be overlaid for a more accurate picking.



crosshole transmission tomography

2D-dataanalysis, modelling

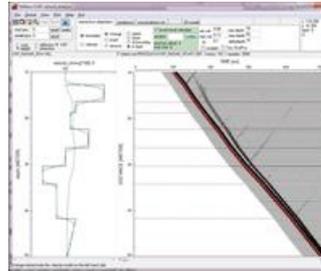
In this method the sources (p- or s-wave source) and the receivers may be freely placed within 2 boreholes or at the surface. Again the **first arrivals** must be **picked** and these traveltimes form the base for a subsequent **tomographic 2D or 3D-inversion** based on **SIRT** (simultaneous iterative reconstruction technique). The picking of the first arrivals can be done by different automatic methods or manually or by a combination of both. The deviation of the boreholes (true xyz-coordinates) can be taken into account. Besides this crosshole geometry the tomographic inversion can also handle data of any complex 2D-geometry.



Vertical Seismic Profiling

2D-dataanalysis

In this method the source is located at the surface and the receivers are placed within the borehole or vice versa. The picked first arrival traveltimes or the raw data can be manually adapted by a 1D-depth velocity distribution. In addition to the interactive model adaptation the local velocities can also be directly inverted. The velocities are smoothed over a given depth window.



single borehole reflection

2D-dataanalysis

The figure shows an example of a borehole GPR-reflection measurement (data from Kali+Salz, Kassel, Germany). There are many different kinds of displaying the equidistant or non equidistant profiles in the point and wiggle mode with zoom- and moving possibilities, manual and automatic scaling. All the features available in the modules data-analysis and data-interpretation may be used for the processing and the interpretation of the borehole data. Distinct elements may be picked, processed and compared to other borehole data. It is possible to extract all available signal informations like travelttime, amplitude, energy or nominal frequency. In addition a 3-component analysis of single borehole data is possible.

