



## **An Inversion Program with automatic data processing for Travel-Time based Hydraulic Tomography**

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Hydraulic travel-time based inversion is a useful and promising technique for tomographic aquifer characterization with highly resolved spatial resolution (Brauchler et al., 2003). This inversion itself is computationally very efficient and robust. However, raw data from the field tests needs large amount of specific processing in order to meet the data requirement of inversion, which decreases the total efficiency of this inversion method. Our Visual C# program provides a complete data processing procedure and inversion computation for this technique. This program allows denoising, smoothing, fitting and derivation of raw data. Graphical presentation of the results with statistical values of each applied function is available. Subsequently, travel times with respect to different percentage of peak amplitude can be calculated and applied to early-time inversion to reconstruct and visualize the distribution of hydraulic parameters (Hu et al., 2011). The inversion procedure is based on Simultaneous Iterative Reconstruction Technique (SIRT) and Ray-Tracing algorithms, through which the inversion parameters can be set by user or automatically. This program also provides Guide- and Help-files to each function and algorithm. Through the first application, this program shows high efficiency and accuracy of data processing and stable inversion procedure with friendly graphical user interface.