



## **Seismic Imaging of the Thuringian Basin, Central Germany, in the framework of INFLUINS**

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The investigation of subsurface fluid motion is essential to understand the processes of compaction, diagenesis, and hydrocarbon migration in sedimentary basins. The goal of the multidisciplinary project INFLUINS (INtegrated FLuid dynamics IN Sedimentary basins) is to unravel the coupled dynamics of near surface and deep fluid flow patterns and material transport in basins on multiple scales. In this framework, the medium size Thuringian Basin in the central part of Germany is an ideally suited geo-laboratory.

Exploring the geological structure of the basin is a key in understanding basin scale fluid flow. Therefore seismic acquisition has been performed in the center of the basin including three reflection seismic profiles complemented by an array of geophones to perform a tomographic study.

Reflection seismic data was acquired along three seismic profiles with a total length of 76 km, where two profiles run from NE to SW and are almost perpendicularly crossed by the third profile. The acquisition was conducted using a Failing Y-2400 vibroseis truck with a maximum force of 218 kN transmitting 6 linear sweeps between 10 to 80 Hz, each 12s long, at more than 2500 vibration points with a spacing of 30 m, whereas recording geophones were set every 10 m. Recording was carried out using 2 ms sampling rate and 4 s recording time with a 384 channel Smart System. Information required for depth migration is provided by one existing borehole located on one profile and a borehole planned to be drilled in the end of 2012 at the crossing of the other two profiles.

Preliminary processing of the reflection seismic data reveals the entire Permo-Triassic sediment sequence of the Thuringian Basin. The Erfurt fault zone, which is crossed by two of the profiles and has been only poorly resolved earlier now has been imaged in high resolution. It is much more pronounced than thought earlier and exhibits a throw of several hundred meters. In addition, the data recorded using the geophon array will provide information about deep structures as far distanced excitations have been identified.