



Drilling the Thuringian Syncline, Germany: core processing during the INFLUINS scientific deep drilling campaign

Michael Abratis, Pascal Methe, Michaela Aehnelt, Cindy Kunkel, Daniel Beyer, Nina Kukowski, and Kai Uwe Totsche

Institut für Geowissenschaften, Friedrich-Schiller-Universität, Jena, Germany (michael.abratis@uni-jena.de)

Deep drilling of the central Thuringian Syncline was carried out in order to gather substantial knowledge of subsurface fluid dynamics and fluid rock interaction within a sedimentary basin. The final depth of the borehole was successfully reached at 1179 m, just a few meters above the Buntsandstein – Zechstein boundary.

One of the aspects of the scientific drilling was obtaining sample material from different stratigraphic units for insights in genesis, rock properties and fluid-rock interactions. Parts of the section were cored whereas cuttings provide record of the remaining units. Coring was conducted in aquifers and their surrounding aquitards, i.e. parts of the Upper Muschelkalk (Trochitenkalk), the Middle Muschelkalk, the Upper Buntsandstein (Pelitrot and Salinarrot) and the Middle Buntsandstein.

In advance and in cooperation with the GFZ Potsdam team “Scientific Drilling” core handling was discussed and a workflow was developed to ensure efficient and appropriate processing of the valuable core material and related data. Core curation including cleaning, fitting, marking, measuring, cutting, boxing, photographing and unrolled scanning using a DMT core scanner was carried out on the drilling site in Erfurt. Due care was exercised on samples for microbiological analyses. These delicate samples were immediately cut when leaving the core tube and stored within a cooling box at -78°C . Special software for data input was used developed by smartcube GmbH. Advantages of this drilling information system (DIS) are the compatibility with formats of international drilling projects from the IODP and ICDP drilling programs and thus options for exchanges with the international data bases. In a following step, the drill cores were brought to the national core repository of the BGR in Berlin Spandau where the cores were logged for their physical rock properties using a GeoTek multi sensor core logger (MSCL). After splitting the cores into a working and archive half, the cores were scanned for compositional variations using an XRF core scanner at the BGR lab and scan images of the slabbed surfaces were performed.

The average core recovery rate was very high at nearly 100%. Altogether, we gained 533 m of excellent core material including sandstones, siltstones and claystones, carbonates, sulfates and chlorides. This provides valuable insight into the stratigraphic column of the Thuringian Syncline.