

Multi-scale structural dataset of a crystalline reservoir analogue (Northern Odenwald)

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For an accurate multi-scale property modelling of fractured crystalline geothermal reservoirs, an enhanced characterisation of the geometrical features and variability of the fracture network properties is an essential prerequisite. By the combination of regional digital elevation model analysis and local outcrop investigation, detailed insight into the 3D architecture of faults and fracture networks allows the quantification of structural parameters (fracture dimension, orientation, clustering and spacing).

The structural dataset presented here contains the regional DEM interpretation at two resolutions (25 m and 1 m) of the Northern Odenwald and the LiDAR and GIS structural interpretation of 5 profiles acquired in the Mainzer Berg quarry between Darmstadt and Dieburg. This quarry exhibits the fracture network affecting a granodioritic pluton. Fracture length, orientation, dip, and fracture density and intensity are calculated for each profile. On GIS 2D datasets extracted from top and side views of the profiles, a clustering and spacing analysis between digitised items is performed and compared to the orientation of artificial scanlines. Power-law parametrisation is extracted from the length distribution of 2D and 3D datasets, with a, b coefficients.

This multi-scale parametrisation of the fracture network can be used to construct near-surface discrete fracture network models.

The dataset is a supplement to another publication (Bossennec al. 2021) that presents the structural organisation of crystalline rocks from the analogue of Mainzer Berg in the Northern Odenwald.

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References

Bossennec, C., Frey, M., Seib, L., Bär, K., and Sass, I. (2021, submitted): Multi-scale characterisation of the fracture pattern of a crystalline reservoir analogue. *Geosciences*