# THE ROLE OF FAULT ZONES IN CALCAREOUS ROCKS AND THE CHANGE IN RESERVOIR PROPERTIES FROM OUTCROP TO DEPTH

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We present depth correlated porosity and permeability studies of calcareous protolithes and fault rocks in the Wetterstein platform (Triassic) of the Hochschwab area.

The Hochschwab area is a karst plateau in Styria that covers an area of about 560 km². The stratigraphic sequences comprise Permian to Upper Triassic sediments, including limestones and dolostones of the Wetterstein Fm. The groundwater circulation follows and E-W directed pattern and is mainly controlled by major tectonic features. This underlines the importance of understanding these fault zones and their impact on reservoir properties. Porosity and permeability characteristics of these strike-slip faults are presented in this study and compared with appertaining protolithes.

Using the standard fault core and damage zone model we grouped samples into unfractured and fractured protolith as well as in different fault rocks, like breccias, cataclasites and stylolithic-fault rocks. Rocks of the damage zone are classified by their fracture density (m² fracture surface per m³ rock) and fault rocks according to their matrix content and differences in grain sizes.

A total of 287 samples from 10 different faults has been investigated in the laboratory using different methods for porosity and permeability measurements. Results present data for two testing mediums (water and nitrogen) and we distinguish between primary features and microfractures.

Results indicate that limestones and dolostones show different trends in the poro/perm evolution along fault zones. Also the different rock categories show complex poro/perm features within one lithology.

Depth correlated data were derived by a VINCI Coreval 700 poropermeameter and display reservoir properties for gas up to 1600m overburden. Results indicate more resistance of fault rocks to overburden than undisturbed rocks. Furthermore first attempts allow to define the ratio of pores and fractures in different samples and their impact on the depth-depended behavior.