



## **Deformation mechanism and age constraints of fault zones bordering the Leithagebirge (SE Vienna Basin, Austria).**

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In this study we combine remote sensing, structural field mapping and microstructural investigations in order to quantitatively describe a fault zone, which facilitated the exhumation of the Leithagebirge. The Leithagebirge is a horst/ridge, which is located at the southeastern margin of the Vienna Basin (Eastern Austria). The mountains form a SW-NE elongated topographic ridge of 34 km length and 9 km width, bordered by major faults against the sediments of the Vienna Basin in the W, the Eisenstadt Basin in the S and the Pannonian Basin in the E. The elevation of the ridge ranges between 118 m to 484 m (Sonnenberg), rising abruptly from the surrounding, extremely low-relief areas. The lithologies of the Leithagebirge comprise mainly Palaeozoic gneisses and mica schists (i.e. Variscan metamorphic basement), which are overlain by Permo-Triassic sediments of the Lower Austroalpine realm. The rocks have been strongly deformed and metamorphosed during the Eoalpine orogeny. The metamorphic rocks of the Leithagebirge are overlain by Badenian to Sarmatian sediments dominated by the fossil-rich (Corallineaceae) calcarenites (i.e. Leithakalk).

Because the outcrop situation is generally very poor, this work focuses on a quarry (Schraufstaedter) near Wimpassing at the SW margin of the Leithagebirge. In this quarry the metamorphic Permo-Triassic sediments consisting of ductily deformed quartzites and marble mylonites are exceptionally well exposed. The white quartzites record a weak stretching lineation and deformed by dynamic recrystallization mechanism (mainly basal glide and subgrain rotation). Locally a quartzite conglomerate with cm-long oblate deformed components can be recognized. The quartzites form N-S striking several 10-100 m long lenses, which are tectonically juxtaposed within fine grained marbles, which record a mylonitic foliation with a roughly NW-SE striking stretching lineation. The whole sequence suffered a strong cataclastic overprint as part of a several 100 m thick brittle fault zone forming the SW margin of the Leithagebirge. The ultracataclastic fault core consists of cohesive cataclasites with partly rounded left-over components. The protocataclastic damage zone records several dm- to m-thick vugs, which are covered with cm-thick flowstones. This brittle fault zone is overlain by clastic sediments of Badenian age, which record no evidence of tectonic deformation. We therefore suggest that the exhumation of the Leithagebirge ridge develop prior to the Badenium.