Brittle fault analysis in the Greywacke Zone (Iglsbach-, Sperl- and Fuxgraben/Salzburg/Austria) and associated deformation of overlaying Quaternary sediments

Julia Märtin[1], *Hans Steyrer*[2]

[1] *Faculty of Natural Sciences; Department of Geography and Geology, University of Salzburg, Hellbrunnerstr. 34, A-5020 Salzburg, Austria; e-mail: julia.maertin@stud.sbg.ac.at*
[2] *Faculty of Natural Sciences (Geology Division), University of Salzburg, Hellbrunnerstr. 34, A-5020 Salzburg, Austria; e-mail: hans.steyrer@sbg.ac.at*

Some characteristics of present-day land surface can be used to decipher the palaeotectonic record. Most of this information is derived from narrow zones centered on faults or immediately adjacent to them, because these are the sites where an unambiguous record of deformation can be obtained.

Several valleys in the Greywacke zone exhibit excellent natural and - due to newly constructed roads - artificial outcrops in bedrock and overlaying Quaternary sediments. Therefore, as a first step, the tectonic features of three small fault-controlled valleys in the Greywacke Zone (Iglsbach-, Sperl- and Fuxgraben), trending parallel to the prominent Salzach valley fault in N- to NE direction have been examined in outcrop scale. In a second step, overlaying ice-marginal terrace sediments and/or glaciofluvial sediments capped by basal till were studied in order to detect Holocene tectonic overprint and thus still ongoing tectonic activity until present.

Three small investigated valleys cut into metamorphic rocks of the Greywacke Zone, which mainly consists of dark phyllites and a few several meters thick metavolcanic layers. The valleys generally trend NE and appear to be the traces of steep, NE trending normal faults. First results of field work indicate that the meandering course of the valleys in map scale seems to be influenced by prominent vertical AC planes of W- to NW striking folds. These AC planes are dominant within the gneissic metavolcanics only and could well be the reason for meandering in the observed range.

Locally the bedrocks are overlain by horizontal Quaternary sediments of the last glaciation stage. The sediments originate from ice-marginal terraces or glaciofluvial processes more generally and are mainly medium- to fine-grained noncohesive sands with layers of loamy sands or clays.

Occasionally normal faults could be detected within the fine-grained sands, trending NE and dipping steeply SE. Vertical displacement along these normal faults is in the range of several centimeters. We are aware, that gravitational settling of the quaternary sediments could be the reason for these normal faults. However, the correspondence of orientation and displacing between the recent movements within the sediments and the faulting of the bedrocks clearly indicates a genetic connection and long lasting movements under a constant stress field.