

## ***Structural observations at macro- and micro-scale in the upper Obernberg Valley, Tyrol, Austria/Italy***

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In the eastern part of the Austroalpine Ötztal-Stubai basement complex insights into its post-Variscian evolution are provided by remains of the sedimentary cover and tectonically overlying slivers (upper Austroalpine units: Steinach and Blaser nappe). The Mesozoic predominantly carbonatic lithologies suffered shearing deformation under greenschist facies conditions during Late Cretaceous/Early Tertiary WNW-ESE extension (D2, Ducan-Ela-phase sensu Froitzheim et al., 1994; Fügenschuh et al., 2003). Geological mapping at the scale of 1:10.000, focussing on brittle and ductile deformation and <sup>40</sup>Ar/<sup>39</sup>Ar- and <sup>87</sup>Rb/<sup>87</sup>Sr-age dating (in cooperation with the Geological Survey of Austria) form the basis of this study.

Emphasis was laid on microstructural variations across a large-scale (400m wide) D2 shear zone mainly built up of carbonate series. While dolomites from the Hauptdolomit formation behaved in a brittle manner in the shear zone, calcareous rocks in the shear zone deformed plastically producing large-scale isoclinal folds. The top of the dolomitic succession and the transition zone were also affected by these folding processes and were partly boudinaged. The strain gradient is microscopically visible by a reduction in both calcite and dolomite grain size. A chemo-mechanical mixing induces calcite-dolomite mixtures, in which decreasing calcite grain size with increasing dolomite content is visible. In this way the formation of polymineralic mylonites might be related to a rheological weakening.

The results of the mapping indicate also isoclinal folding of the tectonic contact between the metasediments and the Steinach nappe. Quartz phyllites of different ages (Mesozoic in the south, Palaeozoic in the north) so far caused problems with respect to their positioning in the tectonic units. This work interprets the Mesozoic ages of the quartz phyllites in the south of the investigated area as overprinted ages due to D2 folding. This means all quartz phyllites are of Palaeozoic origin and can be attributed to the Steinach nappe. Further proof for this model is given by the correlation of axial plane traces and their relations in the Mesozoic sediments and in the Steinach nappe.

### References:

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