

The Schneeberg fault and its relation to the Vinschgau shear zone: the western termination of the Cretaceous high-pressure belt

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In the southwestern part of the Eastern Alps last remnants of the Koraple-Wölz high pressure nappe system, i.e. the Texel complex, can be found (Schmid et al., 2004). The northern limit of the Texel complex against the Ötztal nappe is marked by the Schneeberg fault zone, a NW-dipping mylonite belt (SÖLVA et al., 2001). These mylonites with consistently top-to-the NW kinematics are folded around steeply NW dipping rather open folds and finally merge into the mylonites of the Vinschgau shear zone (Schmid & Haas, 1989), where the high-pressure rocks do not crop out any more. Towards the S and SE the Texel complex is separated from the Meran-Mauls basement by the Jaufen fault. Although dissected by the Miocene strike-slip along the Passeier fault the Jaufen fault can be traced along the Thurnstein mylonites and finally into the Vinschgau shear zone again.

Thus, coming from the west, top-to-the-WNW thrusting along the Schlinig thrust can be traced into the Vinschgau shear zone exposing continuously deeper levels of thrusting. At the entrance of the Schnalstal the Vinschgau shear zone splits into two segments with the high-pressure Texel complex in between.

Based on literature data, structural mapping and microstructural investigations we suggest that the present-day nappe stack is refolded and appears overturned in large parts. This leads to a reinterpretation of the normal fault character of the Schneeberg fault as a thrust and the Jaufen fault, seemingly thrusting Cretaceous metamorphic rocks towards the SE onto “unmetamorphic” Meran-Mauls basement, as an overturned normal fault. Late Cretaceous normal faulting affected the Cretaceous nappe pile at different levels and thus under different metamorphic conditions with consistently top-to-the SE kinematics. In the west the Schlinig thrust was reactivated as a normal fault in a brittle manner while in the east deeper levels of normal faulting are exposed at the top of the Brenner Mesozoic and the overturned Jaufen fault. The Pejo fault, also forming part of the late Cretaceous extension forms a separate fault which can not be linked with the Jaufen system. Folding of the Cretaceous thrust and normal fault contacts is interpreted to be of Tertiary (Eo-Oligocene) age in analogy to Meier (2003) giving rise to erosion controlled exhumation. Final shaping of the area was during Miocene indentation and faulting along the Giudicarie fault system.

References:

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