

**THE SPRECHENSTEIN-MAULSER TAL LINE:
A NEW TRANSFER-FAULT OF THE PERIADRIATIC SYSTEM,
EASTERN ALPS SOUTH OF THE TAUERN WINDOW**

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The tectonic relationship between the Brenner low-angle detachment and some major faults of the Periadriatic lineament (North Giudicarie, Passeier, Pustertal, DAV) in the Eastern Alps has been a matter of long debate (e.g., RATSCHBACHER et al., 1991; FÜGENSCHUH et al., 1997; MANCKTELOW et al., 2001; MÜLLER et al., 2001). Our field survey for the Brenner Basis Tunnel (BBT) project has given new data on this problem, providing a more complete tectonic framework of the southern edge of the Austroalpine-Penninic wedge, Maulser tonalitic lamella (Oligocene) and Brixen granite (Permian) along the Franzenfeste-Pfischthal corridor (DAL PIAZ et al., 2001). This area is characterised by: i) numerous NNE-SSW (Brenner-type) faults, dissecting the overturned southern Austroalpine-Glockner nappe stack, and ii) a major WNW-ESE dextral shear-zone, called Sprechenstein-Maulser Tal (Val di Mules) fault. This previously unknown fault runs from the Sprechenstein castle (south of Sterzing alluvial plane, where it probably cuts the ductile-brittle Brenner deformation zone), through the Mauls valley, where it displaces the Pustertal fault, to the Valles valley, where it is evidenced by a wide cataclastic interval inside the Brixen granite. Its NW extension beyond the Eisack (Isarco) valley can not be excluded, as well as a second major fault below the Eisack alluvial deposits which would accommodate the dextral displacement between the Penser Joch and Mauls Permian-Triassic slices.

The dextral movement of the Sprechenstein-Maulser Tal fault is constrained by consistent

kinematic indicators (slickensides, T and R-type joints) and the displacement of the Pustertal fault, Maulser Tal tonalitic lamella and Austroalpine-Glockner nappe contact. The dextral offset of the Pustertal line and Maulser lamella is of 1.5 km, while that of the Austroalpine-Glockner contact is of 4.5 km. This kinematics is compatible with the continuing N-S plate convergence, late evolution of the Brenner low-angle detachment and vertical to eastward lateral extrusion of the Penninic units. After the Oligocene magmatic pulse, the Sprechenstein-Maulser Tal fault was the most important tectonic feature in the study area. The recognition of Brenner SC' structures NE of this tectonic line (close to the Sprechenstein castle) and their absence in the opposite side suggest that also the Brenner detachment was dextrally displaced by the NW extension of the Sprechenstein-Maulser Tal fault.

Numerous NNE-SSW faults pervasively dissected the southern Austroalpine-Penninic nappe stack and the Oligocene Rensen pluton. Their sinistral transtensional kinematics is consistent with the brittle dextral movement of the Sprechenstein-Maulser Tal fault.

References

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