

The 300-km-long Innsbruck–Salzburg–Amstetten (ISAM) fault system: A major displacement line in the northern Eastern Alps

H. Egger¹ & Herwig Peresson²

¹*Geological Survey of Austria, Wien, Austria*

²*Institute of Geology, University of Vienna, Wien, Austria*

Detailed mapping in the Flysch zone and microtectonic survey allow to trace a large scale shear zone in the northern Eastern Alps between Innsbruck (Tyrol) and Amstetten (Lower Austria). Mosaicking the different fault segments to a continuous shear zone adds another order displacement line to the Miocene lateral extrusion of the Eastern Alps. This over 300-km-long fault system crosses the Northern

Calcareous Alps (NCA), the Flysch zone, the Ultrahelvetetic units and finally the Molasse zone. Minimum cumulative sinistral offset in the Flysch and Molasse zone is 48 km. The ISAM-fault therefore is of similar importance as the well known Salzach–Ennstal fault system which also originated during eastward lateral extrusion of the central Eastern Alps.

The NE-striking ISAM-fault is kinematically linked with the N–S trending Brenner normal fault which merge together near Innsbruck. Normal displacement of the Brenner line during unroofing of the Tauern window was trans-

ferred to sinistral strike-slip faulting along the western segment of the ISAM-fault which follows the Inn valley east of Innsbruck. North of Kufstein the fault system bends for 20 km from a NE- to ENE-direction heading towards Salzburg. Increased deformation in the bend zone caused thrusting of Triassic carbonates of the Kaisergebirge over Oligocene sediments which are commonly captured in the course of the fault system. North of the bend zone a array of NNE-trending sinistral faults branches off from the main system. East of the bend zone, the fault separates the Tirolic and Bajuvaric nappe system of the NCA. Near Salzburg, the fault reaches the northern margin of the NCA and follows the floor thrust of the NCA before entering the Flysch units. Deformation there is partitioned into sinistral faulting on ENE-trending

strike-slip faults and NE-directed thrusting. The Bajuvaric nappe system disappears over a distance of c. 150 km. A large part of this disappearance can be attributed to oblique sinistral movement along the ISAM-fault which offsets the thrust boundary between the Bajuvaric and Tirolic nappes. The continuation of the fault system in the Flysch zone is locally covered by NE-directed out-of-sequence reactivations of the floor thrust of the NCA. Several off-branching splay faults offset the Flysch floor thrust onto the Molasse. Finally, the main fault segment offsets the Flysch/Molasse boundary SW of Steyr for at least 20 km. East of Steyr, the sinistral ISAM-strike-slip fault merges into the sole thrust of the subalpine Molasse causing NNE-directed thrust movements.