4D-MODELLING OF FAULT KINEMATICS ALONG A PERIADRIATIC FAULT CROSS SECTION DEDUCED FROM (U-TH)/HE AND FISSION-TRACK ANALYSES

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Mauls, fault kinematics, fission track, 4D-modelling

N-S-sections illustrating upper crustal structure of the western Tauern Window have been published (Brandner et al. 2008; Schmid et al. 2013) according to geological reconnaissance of the Brenner Basistunnel (BBT). Crossed Austroalpine nappes (N-S) are allocated to Silvretta-Seckau System, Ophiolite-bearing Penninic units as well as Subpenninic nappes of Venediger Duplex and its hanging wall. The southernmost part cuts across Southern Alpine rocks. Major fault zones (N-S) – Tauern Northern Boundary Fault, Defereggen-Antholz-Vals Fault, Maulsertal Fault and Pustertal Fault – are pierced nearly perpendicularly (strike) at different angles of either simple or overtilted northward dip.

This study focuses on the intensely compressed transition zone between Austroalpine rocks and indenting Southern Alpine units nearby Mauls (Italy) with its roughly orogen-parallel fault system.
Specification of distinguishable uplift rates valid for fault-delimitated tectonic units along a set of sections will increase fundamental understanding of local tectonic history. Therefor quantification of vertical movement within delimitable periods is derived from differential cooling paths of recent adjacent blocks. Subsurface samples have been collected in the course of BBT-excavation. Cooling path modelling assembles three age-temperature pairs per sample: Zircon (ZFT) and Apatite (AFT) fission track as well as (U-Th)/He analysis cover an adequate temperature range.

Recent time-temperature models such as proposed by Schneider et al. (2015) suggesting cooling rates of 10,7 to 16,7 KMy^{-1} for Venediger Duplex rocks, are mainly based on surface samples. Pomella et al. (2012) include compiled data and present consistently young (early Miocene) ZFT-ages within Meran Mauls Basement and around Mauls besides Variscan Rb/Sr and K/Ar ages.

We aim for an enhancement of tectonic and kinematic arrangement by interpreting new thermochronologic data embedded in preexisting models. Therefore, we work on
- modelling time-temperature paths derived from subsurface samples,
- refining polyphase behavior of fault zones and corresponding kinematics,
- optimizing N-S-sections as well as generating E-W-sections.

Latest acquired ages show that expected results will represent a substantial kinematic record for reconstructing fault behavior within the uppermost crustal 10 km. A 4D model incorporating generated and prior data will be proposed as an indication for the transition zones tectonic evolution.