



New fission track thermochronological investigations in the Austroalpine units to the southeastern border of the Tauern Window (Eastern Alps, Austria)

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1 Introduction

The Kreuzeck Massif belongs to the Austroalpine basement units to the south of the Tauern Window. The SE trending dextral Möllvalley strike slip fault marks the border to the Penninic units. It was active during lateral extrusion in Early to Middle Miocene time (Frisch et al. 2000). Conjugate, ENE trending sinistral and SE trending dextral faults of the same event characterize the Austroalpine zone of the study area. Since Grundman & Morteani (1985) and Staufenberg (1987), it is known, that the northern part of the Austroalpine basement of the Kreuzeck Massif underwent a similar uplift and cooling history as the adjacent Penninic units of the Tauern Window. A prominent boundary is the “Main Mylonitic Zone” (Putiš et al. 2003) a NW-SE striking shear zone parallel to the Möll Valley. In the northern part, apatite fission tracks show Miocene ages (19 – 11 Ma), whereas to the south of that shear zone the ages range from Oligocene to early Miocene (31 - 21 Ma). That indicates different uplift rates of these two units along the “Main Mylonitic Zone”. Zircon fission track ages

in the Kreuzeck area show a wide range from Paleogene ages close to the Penninic Tauern Window (51 – 34 Ma) to Jurassic and Cretaceous ages (160 – 75 Ma) more to the south (Dunkl et al. 2003). That shows that the Austroalpine basement south to the eastern Tauern Window has not suffered Miocene thermal overprint reaching the zircon fission track annealing temperature (240 - 280 °C).

2 Aims

- Determination of the uplift rates of distinct blocks that were formed during lateral tectonic extrusion?
- What was the paleostress field during brittle deformation and formation of these blocks?
- What role did cataclastic and ultracataclastic zones play, and in which time were these zones active?

3 Preliminary Results

Our first investigations concerning apatite fission track thermochronology confirm ages between 13 and 22 Ma for the northern part of the Kreuzeck Massif.

Investigations of brittle structures show different orientations of the maximum principal stress axis σ_1 , with NNE-SSW orientation in the western part of the study area. The northern and eastern areas mainly indicate NW-SE orientation of σ_1 with dextral strike slip movement, related to lateral extrusion tectonic. This observation fits well to NW-SE trending volcanic dykes dated 32 – 35 Ma (Deutsch 1984), whereas normal faulting and reverse faulting show NE-SW orientation of σ_1 .

4 References

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