

Kinematics, Conditions and Timing of the Katschberg Normal Fault at the eastern end of the Tauern Window (Austria)

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The Katschberg normal fault forms the eastern limit of the Tauern Window (Eastern Alps, Austria), separating the Penninic units in the footwall from Austroalpine units in the hangingwall to the E. The Katschberg normal fault comprises a mylonite belt with a strong mylonitic foliation and down-dip stretching lineation plunging variably to the NE to SE. This mylonitic foliation is gradational with a brittle fault with almost the same dip, but is cut locally by a later brittle fault. The southern part of the mylonitic footwall is affected by the SE-plunging Hochalm dome.

A series of tectonic profiles across the eastern margin the Tauern window constructed from existing geologic maps reveals that the amount of tectonic omission increases from N to S along the Katschberg normal fault. Our investigations center on the following questions: (1) Did folding and Hochalm doming occur before or during E-W extension at the eastern end of the Tauern Window? (2) Are different stages of the extensional history preserved along strike of the Katschberg Mylonite Belt?

To determine the conditions of shearing, we analyzed garnets from aluminous layers of Jurassic schist (so-called Bünderschiefer) that evidently grew during and after mylonitic flow of the main foliation related to the Katschberg normal fault. These garnets have a prograde chemical zonation, with cores of $\text{Alm}_{0,42}\text{Sps}_{0,4}\text{Grs}_{0,18}\text{Prp}_{0,02}$ and rims of $\text{Alm}_{0,50}\text{Sps}_{0,27}\text{Grs}_{0,20}\text{Prp}_{0,03}$. The spessartine-rich composition of these garnets suggests that syn- to post-kinematic garnet growth may have occurred under upper greenschist-facies conditions, rendering them excellent potential minerals for dating the onset of mylonitic shearing during crustal-scale extension. Muscovite forming the mylonitic foliation may yield cooling ages with the Ar-Ar method; this work is in progress.