

DATING TRANSPRESSIONAL DEFORMATION ALONG THE SALZACHTAL-FAULT (AUSTRIA): NEW IMPLICATIONS FOR THE EXHUMATION HISTORY OF THE TAUERN WINDOW

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The Salzachtal-Ennstal fault zone (SEMP) is a major crustal-scale transpressional shear zone, which developed at the northern border of the Tauern Window during Tertiary lateral extrusion and unroofing of the Tauern Window (LINZER et al. 1997; NEUBAUER et al., 1999; Fig. 1). In the research area between Zell am See and the Rauriser Ache the Salzachtal-Fault juxtaposes rocks of the Paleozoic Upper Austroalpine Greywacke Unit and the Penninic Units of the Tauern Window. Both units show distinct deformational and cooling histories, which are

described using new *kinematic* data and *geochronological* Ar/Ar age datings.

(A) The Penninic Units of the northernmost Tauern Window are part of a transpressional shear zone accomodating sinistral *ductile shear* and *NNE/SSW compression* along the E-W-striking shear zone. Kinematic data are mainly obtained from mylonitic marbles. Formation ages of synkinematic minerals from *28 Ma to 35 Ma (Late Eocene to Early Oligocene)* constrain the age of sinistral transpression at the northern border of the Tauern window. These ages are well

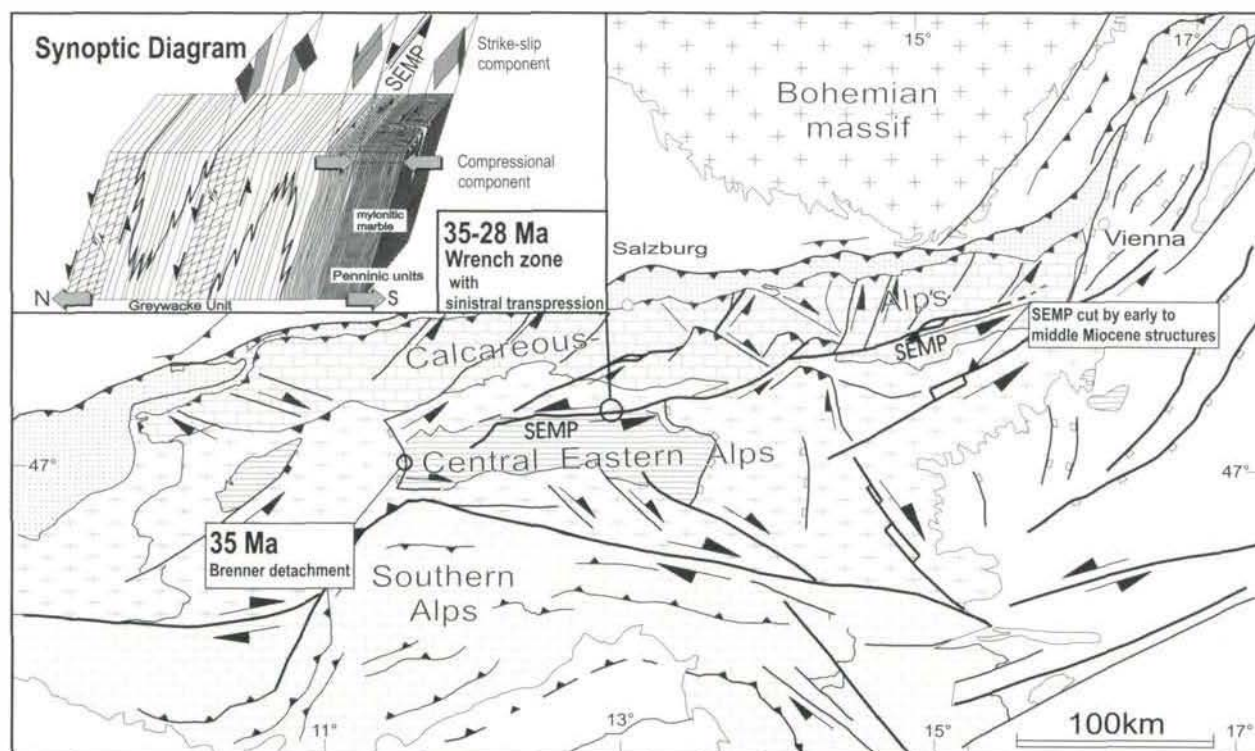


Fig. 1

Ar/Ar - Data Penninic Unit

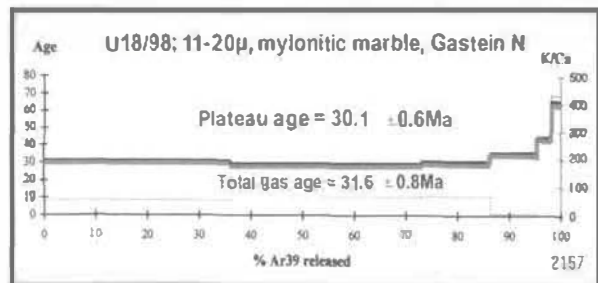
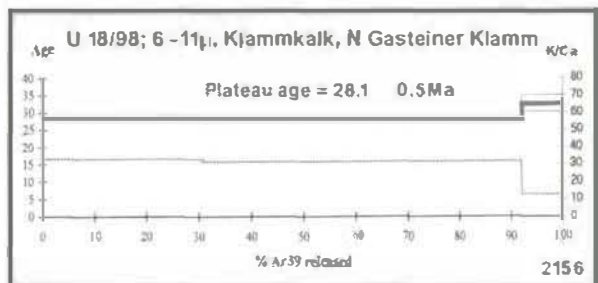
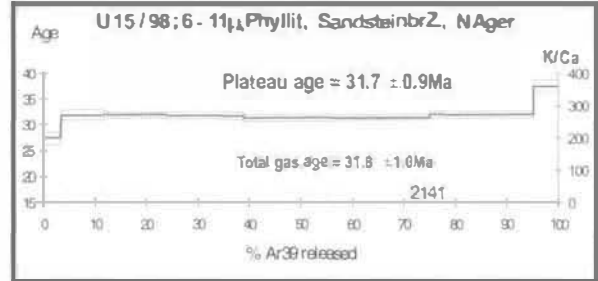
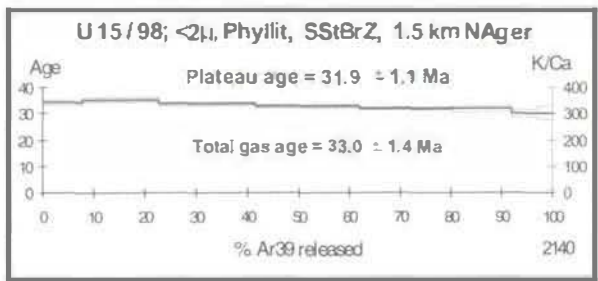
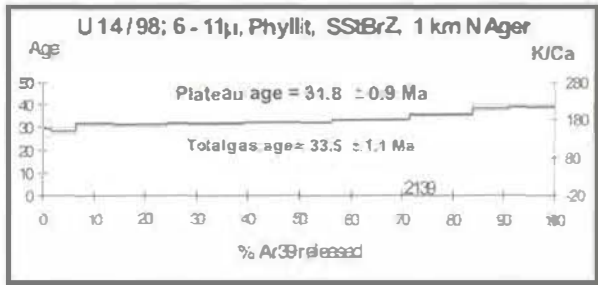
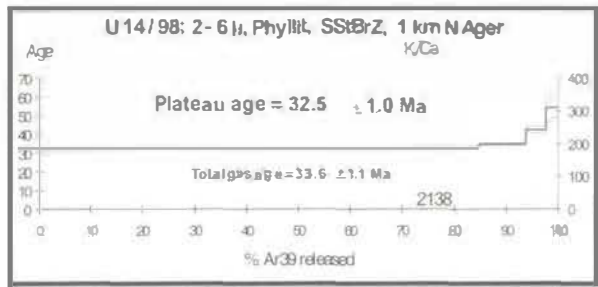
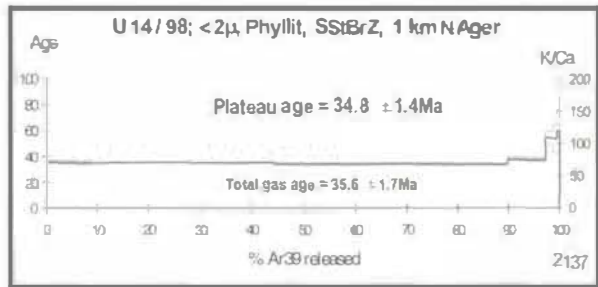
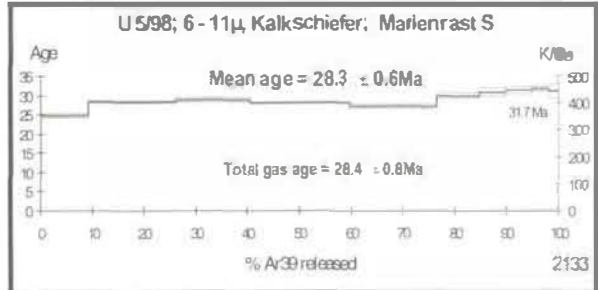
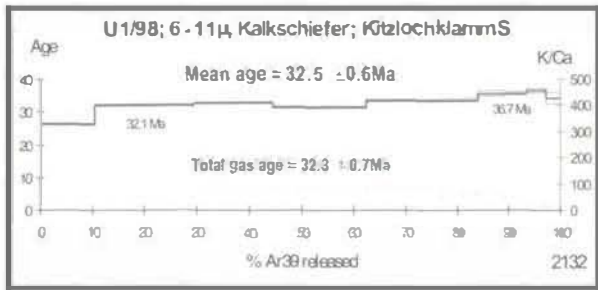


Fig. 2

defined by 9 Ar/Ar data from mica of different grain size fractions (< 2 m, 6–11 m and 11–20 m; Fig. 2). Indications for cretaceous ages in the cores of the micas are given.

(B) The rocks of the Greywacke Unit are devoid of comparable transpressional structures. The unit was affected by three main Cretaceous (*eoalpine*) deformation events: (a) *ductile shear* (D_n) related to the formation of \pm E-W striking, subhorizontal stretching lineations, (b) *south-vergent folding* (D_{n+1}) and (c) *normal faulting* (D_{n+2}) towards N indicated by SC-fabrics. 6 Cretaceous Ar/Ar-cooling ages ranging from 90 to 115 Ma from white mica (< 2 m, 6–11 m and 11–20 m) indicate that the deformations D_n to D_{n+2} occurred during the Cretaceous.

Structures related to *sinistral transpression* provide further evidence for the kinematics of the sinistral SEMP-wrench fault north of the Tauern window, which is kinematically related to the exhumation of the Penninic Units south of the fault (LINZER et al. 1997; NEUBAUER et al., 1999). This *wrench zone* previously was interpreted as a Late Oligocene and Early Miocene structure. However, Ar/Ar data record *Late Eocene/Early Oligocene (28 Ma – 35 Ma) ages* for transpressional deformation at the northern border of the Tauern window. The data presented in this study

are in line with previously published age data constraining the onset of decompression of the Penninic Units of the Tauern Window with 35 Ma (SELVERSTONE 1993).

References

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