Geophysical Research Abstracts
Vol. 15, EGU2013-11548, 2013
EGU General Assembly 2013

Relationship of orogen-parallel exhumation in the Tauern and Rechnitz Windows to eastward lateral escape of the Eastern Alps

Silvia Favaro (1), Ralf Schuster (2), Andrea Scharf (1), and Mark R. Handy (1)
(1) Freie Universitaet Berlin, Germany (silvia.favaro@fu-berlin.de), (2) Geologische Bundesanstalt, Wien, Austria

Neogene orogen-parallel extensional in the Tauern and Rechnitz Windows and eastward lateral extrusion of the Eastern Alps are manifested, respectively, by exhumation and cooling and by subsidence of pull-apart basins. These events overlap in time, giving rise to the question of their relationship.
The Tauern Window exposes relics of the European continental margin (Subpenninic units) and Alpine Tethys Ocean (Penninic units) beneath units derived from the Adriatic microplate (Austroalpine nappes). In the eastern part of the Tauern Window, the Subpenninic and Penninic nappes are deformed by two domes (Sonnblick and Hochalm domes) and the intervening tight Mallnitz synform. Reddy et al. (1996) proposed that the Sonnblick dome cooled first based on a trend of decreasing Rb-Sr and Ar-Ar white mica and biotite ages from the northwestern part of the Sonnblick Dome to the southeastern part of the Hochalm dome. When combined with this existing dataset, new Rb/Sr biotite ages point to simultaneous cooling of the domes to below the closure temperature of this isotopic system.
Rb-Sr muscovite ages decrease from 26-30 Ma in the northwest to 20-25 Ma in the southeast. Rb-Sr biotite ages young in the same direction from 20-23 Ma to 16-19 Ma. The biotite ages do not vary in a transect of the Mallnitz synform and are therefore inferred to post-date this structure. Apatite fission track data follow this same NW to SE trend. A SE increase in intensity of mylinitic shearing along strike of the Mallnitz synform is interpreted to be a manifestation of stretch faulting related to normal faulting along the central part of the Katschberg Shear Zone system at the eastern end of the Tauern Window (Scharf et al., submitted). We attribute the SE decrease of the biotite cooling ages to an increased component of tectonic unroofing towards the eastern margin of the Tauern Window.
Three new Rb-Sr biotite ages in the range of 16-26 Ma from the lowermost Austroalpine units (Wechsel and Semmering nappes) immediately above the Rechnitz Window are also interpreted to reflect cooling during extensional exhumation. This age range overlaps with that of rapid subsidence and sedimentation in pull-apart basins of the Eastern Alps (17-12 Ma) and opening of the Pannonian Basin (21-15 Ma) behind the retreating Carpathian subduction orogen. This suggests that exhumation in the Rechnitz Window and lateral escape of the Eastern Alps were broadly coeval with both Adriatic indentation and Carpathian rollback subduction.