

40Ar/39Ar MUSCOVITE AGES FROM THE PENNINIC/AUSTROALPINE PLATE BOUNDARY, EASTERN ALPS

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The Radstadt Mountains, Eastern Alps, expose the tectonic boundary between the base of the Austroalpine continental plate (hanging wall) and the Penninic oceanic units (footwall). Low-grade metamorphic conditions of the Alpine metamorphism make this succession to an ideal test site for a 40Ar/39Ar survey, based on dating of muscovite, to reveal timing and duration of tectonic processes in an orogenic wedge. All ages reported here are laserprobe 40Ar/39Ar ages of muscovites (c. 10 grains). The Gurpitschek unit, Austroalpine basement, was penetratively deformed during the Permian due to ongoing rifting of the continental crust (290 - 270 Ma). Permomesozoic cover rocks were deformed during Cretaceous (~80 Ma) and Paleogene (45 - 40 Ma), the latter ages are from deeper tectonic levels. These ages are interpreted to represent two distinct events of nappe stacking. The younger ages record the collision of Austroalpine and Penninic tectonic units. Penninic units are characterized by two distinct age groups: The Matrei zone, the infilling of a deep-sea trench, is characterized by ages of 35 - 30 Ma, the deeper Glockner nappe (oceanic crust) records ages between 25 - 23 Ma. Along the Penninic to Austroalpine plate boundary a weak thermal overprint at ca. 20 - 18 Ma was found due to ductile extension of the overthickening of the orogenic wedge. The new age data show that tectonic accretion lasted over a period of more than 50 Ma, and that distinct events are responsible for thickening of the orogenic wedge.