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NEW AGE CONSTRAINTS ON ALPINE METAMORPHISM OF THE SCHISTES LUSTRÉS OF THE ENGADINE WINDOW BASED ON AR-AR, RB-SR AND FISSION TRACK DATING

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Within the nappe stack of the Penninic windows that crop out in 4 tectonic windows within the Eastern Alps large areas are covered by schistes lustrés (Bündnerschiefer, calceschisti) of Creatceous age. The schistes lustrés are involved in at least two accretionary wedges, both indicated by the occurrence of HP-LT-minerals (carpholite, high-Si-phengite, glaucophane, lawsonite). However, structural and metamorphic evolution (timing of peak metamorphism , detailed deformation history) of the schistes lustrés complexes is badly known. At present only a few Ar-Ar-data from the Tauern window (ZIMMERMANN et al. 1994, LIU et al. 2001) and the Rechnitz window at the eastern end of the Eastern Alps exist. The Lower Engadine window exposes both accretionary wedges within a short horizontal and vertical distance. Therefore this area is well suited for structural, geochronological work and petrological investigations. During the last 5 years isotope analytical work of samples from all tectonic units of the Lower Engadine window has been performed using different geochronological techniques: Ar-Ar, Rb-Sr and Fission Track dating on mica, carpholite and zircon. As can be seen from the data below Ar-Ar and Rb-Sr dating methods seem to be the most suitable ones for dating of schistes lustrés of the Lower Engadine window. A cross section from the highest to the deepest tectonic levels within the window was sampled and investigated. Samples from the highest tectonic unit of the Lower Engadine Window show two different patterns of Ar-release spectra depending on lithology. Micas from Jurassic sandstones and Permian granites resulted in stair-wise patterns indicating young Alpine mica rims of unknown age and old cores of Late Palaeozoic

age (ca. 310 Ma for Tasna-granite and 270 Ma for Idalp-sandstone of Jurassic age). Fine grained sediments show Alpine ages of about 41 Ma that may reflect the age of HP-metamorphism of the Fimber unit. Samples from the Zone of Pfunds reflecting HP-LT-metamorphism (indicated by glaucophane, phengite and carpholite, see BOUSQUET 1998) show significantly younger ages of about 35 Ma to 27 Ma. These ages result both, from Ar-Ar- and Rb-Sr-dating on white mica and may correspond to the peak of HP-LT-metamorphism in the Zone of Pfunds. To constrain the age of the peak of HP-LT-metamorphism Sm-Nd analyses of carpholite has also been performed. However total spread in the $^{147}Sm/^{144}Nd$ between carpholite and the "whole rock" was too small ($^{147}Sm/^{144}Nd$ = 0.19 for carpholite, and 0. 13 for "whole rock" for calculating a meaningful age. To constrain the late metamorphic history of the schistes lustrés complex Fission Track dating was performed on zircon samples. The FT ages from the Zone of Pfunds are 48 Ma +/- 8 indicating that there was no total annealing of old tracks in the zircons during Alpine metamorphism. This may imply that subduction in a cold regime was very fast and exhumation rates rather high so that full reequilibration of the zircons in the FT-system could not be achieved.

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