

Metamorphism, structure and Geochemistry of the Aar massif-Cover relationship in the Area between Erschmatt and Baltschieder Tal (VS, Switzerland) (1 or 2 Master students in collaboration)

Contact persons: *Lukas Baumgartner / Jean-Luc Epard/Benita Putlitz*

Context

The northern slopes of the Rhone Valley between Leuk-Stadt and Baltschieder near Visp offer excellent outcrops of Triassic to Mesozoic rocks, which are in tectonic contact with the crystalline basement of the Aar massif. The Hercynian, at least amphibolite facies metamorphic and intrusive rocks of the Aar massif have been extensively altered to lower to middle Greenschist facies (e.g. (Challandes et al. 2008)). Greenschist facies alterations **requires** addition of ca. 1-2 wt% of water (on average), resulting potentially in a few volume percent. Alternative events could potentially lead to hydration: Permian-Triassic-Jurassic extension, near-surface hydration at the earth's surface (paleosol-related) before or during deposition of the Permo-Triassic sequence, or Alpine deformation, as proposed before (Challandes et al., 2008). Here we propose to study the Alpine metamorphism and deformation of the tectonic/sedimentary contact between the crystalline basement of the Aar massif and the Permo-Jurassic sediments in the area south of the main Aar massif chain.

Objectives and Methods

Field work: Detail mapping of key localities in the Erschmatt-Baltschieder area, establish detailed profiles. Detailed structural data collection, sample collection

Petrography: thin section analysis of mineralogy, microstructures; XRD analysis

Analytical work: XRF whole rock, SEM -textural analysis, EMPA mineral analysis, Sr and O-isotope analysis

Petrology and Geochemistry: Comparing obtained data with literature; identify and characterize mechanism of alteration; synthesize the metamorphic, structural, and geochemistry history. Propose timing of alteration event(s)

Literature

Berger A, Engi M, Erne-Schmid S, et al (2020) The relation between peak metamorphic temperatures and subsequent cooling during continent-continent collision (western Central Alps, Switzerland). *Swiss J Geosci* 113:–18. doi: 10.1186/s00015-020-00356-4
 Challandes N, Marquer D, Villa IM (2008) P-T-t modelling, fluid circulation, and Ar-39-Ar-40 and Rb-Sr mica ages in the Aar Massif shear zones (Swiss Alps). *Swiss J Geosci* 101:269–288. doi: 10.1007/s00015-008-1260-6
 Dolivo E (1982) Nouvelles observations structurales au SW du massif de l'Aar entre Visp et Gampel. *Beiträger zur Geologischen Karte der Schweiz* 157

1 photo dimension H5.5cm x L8.5cm

WEB sites

Choice of orientation : (supprimer les orientations qui ne conviendraient pas)

2) Geochemistry, Alpine tectonics, Ore Deposits