AGU FALL MEETING
San Francisco | 14–18 December 2015

T51E-2953: Structural, igneous and metamorphic footprints of Pangea break-up preserved in the subducted Austroalpine continental lithosphere of the European Alps.

ABSTRACT

Friday, 18 December 2015
08:00 - 12:20
Moscone South - Poster Hall

Although in the Alps a large amount of continental lithosphere from both European (lower plate) and Adriatic (upper plate) continental margins was absorbed in the sub-lithospheric mantle during Alpine subduction, relict metamorphic and igneous imprints of the Variscan convergence and the successive Pangea break-up are preserved in the continental crust of both margins. These pre-Alpine signatures are preserved either in small volumes within the exhumed continental crust slivers of the axial belt or in the Alpine hinterland and foreland crusts that were never reworked in deep-seated conditions. Because of the common occurrence of metamorphic and igneous markers of the Variscan convergence in the pre-Alpine continental crust, the Permian-Triassic high thermal regime, which left widespread metamorphic and igneous imprints, can be interpreted as the effect of lithospheric thinning leading to continental rifting and subsequent Tethyan ocean opening. In addition, even Permian igneous activity and related basin formation may be interpreted as linked to lithospheric extension leading to the Pangaea break-up and to subsequent oceanization, predating the marine transgression from the east, where the Neotethys Ocean was opening.

Permian-Triassic HT-LP metamorphic imprints recorded in the Austroalpine continental units are correlatable to this scenario; these peculiar metamorphic patterns have been widely recognized in lower, intermediate and upper continental crust. HT assemblages mark newly differentiated foliations locally associated with discrete shear zones, mainly in metapelites. Ages inferred for

Jurassic mineral ages are obtained where LP-LT metamorphic imprints, recorded during uplift and associated with fluid circulation, are dominant. The uplift paths are usually characterized by a high T/P ratio and wide parts of the uplift paths occurred under high thermal regime and the exhumation of some of the deep-seated continental crust units occurred up to shallow crustal levels, thus suggesting that several Austroalpine rocks have been tectonically sampled by a thinned continental margin before being subducted during Alpine convergence.

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