thermal, and subsidence history of rift systems that is recorded by the tectonic, magmatic and sedimentary processes occurring during rifting. Since rifted margins may eventually be reactivated and become part of an orogenic system, understanding their rift architecture may also be a key to understand the final structure of internal parts of collisional orogens. Distal parts of rifted margins are often at deep-water and sealed by thick post-rift sediments, which makes that these highs are difficult to drill. That's why we combine the study of seismic sections with that of field analogues exposed in the Briançonnais domain in the Alps. Mapping the pre-Alpine and Alpine structures of this domain and properly define their stratigraphic and tectonic evolutions provide important insights into the tectonic evolution of distal rifted margins during their formation and subsequent reactivation.

The Briançonnais domain forms the most distal part of the European margin. In contrast to the Adriatic margin that was the focus of many studies investigating the architecture and evolution of the Jurassic margin, much less is known about the structure and evolution of the conjugate Pre-Piemontais/Briançonnais domains. To better understand their evolution during rifting, we reviewed the existing structural, stratigraphic and age data of these domains from Liguria/Italy, across the French Alps to Grisons in Switzerland. We propose new constructed sections across the Briançonnais domain that forms the basis to discuss the rift-related tectono-stratigraphic and subsidence evolution of this domain. This study will enable to compare the along and across strike stratigraphic architecture of the Pre-Piemontais/Briançonnais domains and to compare them with those made at seismic sections imaging deep-water rifted margins (e.g. Campos (S-Atlantic), Newfoundland (N-Atlantic) and eastern Indian margin).

The first results show that the principal Alpine structures in the Briançonnais domain reactivated mainly pre-Alpine structures. The structural evolution and the change in vergence across the Briançonnais domain are likely controlled by the crustal architecture of the former rifted margin. The stratigraphic architecture and its relation to basement structures within the Pre-Piemontais/Briançonnais domains suggest the abrupt juxtaposition of crustal domains of different crustal thickness with strong lateral changes of the top basement architecture. These relations are very similar to that observed along present-day rifted margins. This complex, 3D architecture of the European margin may have played an important role for the distribution of post-rift sedimentary systems as well as for the reactivation of the European margin during the Alpine convergence.

Internal structure of cataclastic faults along the SEMP fault system (Eastern Alps, Austria)

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In this study three different sites along the ENE-trending, sinistral Salzach-Ennstal-Mariazell-Puchberg [SEMP] fault zone were investigated with respect to brittle fault zone evolution and fault re-activation. All sites crop out in Triassic carbonates (Ladinian Wetterstein limestone/ -dolomite). Simultaneously (re-) activated faults were investigated with focus on fault-slip data and structural inventory of each individual fault zone.

Configuration of (internal) structural elements, fault core thickness, strike direction and slip sense in addition to particle analysis of fault core cataclasites add up to three different fault types (Fault type I, II and III).

Fault type I is classified by a complex internal fault core structure with thicknesses up to several 10s of meters and generally evolve in a strike direction of maximum shear stress (τmax). Type II faults, characterized by cataclastic fault cores with thicknesses up to 1m, as well as type III faults (thin solitary cataclastic layers) evolve sub-parallel to the main fault direction and in orientation according to R, R' or X shear fractures with variable (σn / τ) ratio.

Progressive development from type III to type II and type I faults is consistent with increasing displacement and increasing fault core width.

Fault type classification and related paleostress analysis provides evidence from field observation compared to theoretical and analogue models of Mohr-Coulomb fracture evolution.

Changing fluid chemistry during continuous shearing in cataclastic fault zones along the SEMP fault system

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Brittle fault rock samples from carbonate shear zones along the Salzach-Ennstal-Mariazell-Puchberg fault system (SEMP) have been analysed using cathodoluminescence microscopy (CL), microprobe analysis and stable isotope composition. The combination of these analytical methods provides an insight into comminution processes and fluid chemistry. The reconstruction of the evolution of fluid chemistry leads to a chronological classification of five fluid phases with respect to fluid chemistry, CL behavior and related structural processes. Initial cataclasis is accompanied by dedolomitization processes along crystal borders and intragranular fractures derived by Ca-rich fluids (Phase P1). Subsequent fluid phases (P2-P5) are characterized by variable Fe- (and Si-content) and therefore variable CL behavior.

Microprobe element mappings support the discrimination of Fe-enriched, non luminescent phases and Ca- and Mn-enriched fluids with bright luminescent calcite precipitations. Fe-enriched carbonates and Fe-hydroxide precipitation indicates fluid circulation in deeper parts of the stratigraphic sequence. These fluids are assumed to be derived from underlying clastic sequences of the Werfen Formation. Stable isotope signatures (δ13C and δ18O) indicate mainly meteoric origin of penetrating fluids and variable amounts of fluids in the fault zone.

Oligocene and Neogene tectonic processes in the southeastern Alps and northwestern Dinarides: constraints from new (U-Th-Sm)/He apatite ages

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The AlDi-Adria project aims at deciphering the late-stage orogenic evolution for the northern edge of the Adriatic microplate, i.e. the Friuli orocline and its surrounding regions by a combination of structural studies, subsidence analysis and low-temperature thermochronology. Results will form the base for studying the large-scale surface response to deep-seated lithospheric processes, a number of which have been debated for the study area, e.g. slab break-off, slab delamination, orogenic shortening and lateral extrusion. First results from apatite (U-Th-Sm)/He dating (AHe) in combination with existing apatite fission track age constraints allow us to derive some regional patterns of deformation and exhumation in the Southalpine units/Dinarides and phases of fault movement along the PAF. Here, we discuss those constraints on tectonic processes from old to young events.