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.