Timing and evolution of the Middle Triassic shoshonitic magmatism in the Southern Alps (Northern Italy)

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The middle Triassic magmatism in the Southern Alps and particularly in the Dolomites and Lombardian Alps comprises widespread and irregularly distributed volcaniclastic deposits intercalated with pelagic sediments and platform carbonates, basaltic lava flows and plutonic complexes. Previous work mainly based on field observations and geochronology studies concluded that the Middle Triassic magmatism initiated with silicic products [1]. Related thin ash layers, crystal-rich tuffs and bentonites can be observed in stratigraphic sequences throughout the Southern Alps. More mafic products occur further up-section in the form of shallow intrusions and basaltic lava flows. In the central and western Dolomites stratigraphically unconstrained shoshonitic intrusive and effusive bodies including those at Monzoni and Predazzo were emplaced during the late stages of explosive volcanic activity.

In this study we apply high-precision CA-ID-TIMS U-Pb dating of single zircon crystals together with trace element geochemistry and Hf isotopes on zircons obtained by LA-(MC)-ICP-MS in order to unravel the evolution and the interplay between the acidic volcaniclastic deposits and the mafic to intermediate sub-volcanic/intrusive magmatism. We present a detailed stratigraphic framework and a comprehensive zircon petrochronology data set that constrain the timing as well as the chemical and isotopic evolution of this magmatic province. High-precision zircon U-Pb geochronology provides absolute tie-points for felsic ash layers that also bracket and thus constrain the timing of effusion of basaltic lava flows. These data furthermore place precise constraints on the emplacement history of stratigraphically unconstrained intrusive bodies and their genetic links to effusive and explosive volcanic products.

[1] Brack & Rieber (1993) *Eclogae Geologicae Helvetiae* **86** (2), 415-527.