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ABSTRACT BOOK

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COVER IMAGE

Padua, Italy at Prato della Valle by Sean Pavone. Site: elements.envato.com

A journey into the Permian deep crust: a fieldtrip across the Valpelline and Arolla Series, Dent Blanche Tectonic System, Western Alps

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This fieldtrip aims to explore the Adriatic basement of the Valpelline and Arolla Series, which are part of the Dent Blanche Tectonic System in the axial zone of the Western Alps. This area represents a window into rocks and structures of the intermediate to deep continental crust, affected by partial melting, felsic and mafic intrusions during Permian, and successive Alpine deformation and metamorphism.

The fieldtrip is scheduled to take place over four days: i) in day 1 participants will be guided across the rock types of the deep continental crust, to examine different structures and discuss the relative and absolute geochronology of the deformation events during Permian partial melting in the Valpelline Series. In addition, the mylonitic contact between the Valpelline and Arolla Series will be reached; ii) day 2 is dedicated to smoothed outcrops of the Valpelline Series located at 2800 m a.s.l., showing melt-bearing textbook structures in cordierite-migmatitic gneiss, embedding mafic boudins. The structures are cut by multiple systems of aplites and pegmatites; iii) day 3 focuses on the Arolla Series metaintrusive bodies of the Permian Sassa gabbro Complex. The Sassa gabbro preserves different types of magmatic rocks, structures, and textures only locally overprinted by the polyphase Alpine deformation and metamorphism; iv) day 4 aims to explore the Arolla orthogneiss, the dominant rock type in the Arolla Series, within the Mont Morion intrusive complex along the Crête Sèche Valley above Dzovennoz. Although the orthogneiss displays varying degrees of Alpine deformation, developed under blueschist and greenschist facies conditions, it provides opportunities to study pristine magmatic textures, lithologies, and their relative chronology.

This geographical area located in the Western Alps represents a good archive to understand the geodynamic evolution of Adriatic crust during Permian time; the presence of several granitic plutons at shallow crustal levels, like those observed in the Arolla Series, suggests that melt extraction in the Valpelline Series could have been a continuous and efficient process during the Permian. In the Valpelline Series horizons extremely rich in sillimanite which crosscut the regional migmatitic foliation S2, serve as evidence for the interaction between the extracted melts and their host rocks.