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## The Valsugana area (TN, Italy): a structural knot

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In the Valsugana area (Southern Italian Alps) a NE-SW trending pre-permian Southalpine phyllitic basement is intruded by an Early to Middle Permian granitoids (Cima d'Asta, 190 km<sup>2</sup>) and includes volcanic calderas of the Athesian Volcanic Group (125 km<sup>2</sup>) of the same age, and is locally covered by Upper Permian to Miocene sedimentary sequences. A complex system of faults juxtaposes these different geological domains. In particular, the Permian tectonic structures have been repeatedly reactivated during Mesozoic and Tertiary. The phyllitic basement, which suffered Variscan metamorphism and deformation, and the granitoids were dismembered by NNW-SSW and N-S tectono-magmatic faults associated with the opening of permian calderas. The main tectonic system of this area is the ENE-WSW oriented Valsugana fault system of Middle-Late Miocene age (Heberer et al., 2017). The master fault separates the metamorphic basement from the sedimentary sequences (e.g., M. Armentera, M. Civerone and M. Lefre). At the footwall of the master fault, other faults deformed in a compressive to transpressive regime the sedimentary sequences. Some of these are extensional faults were reactivated many times from Triassic to Lower Jurassic. The Valsugana fault system ends against the Permian to Mesozoic Calisio fault to the SW, while it continues to the NE towards Brocon and Cereda Passes (Gianolla et al. 2022). The Valsugana fault system is cut across by the Val di Sella fault of Late Miocene-Pliocene age, oriented c.a. E-W which deformed the northern walls of the Asiago Plateau (Barbieri & Grandesso, 2007), transporting slices of metamorphic basement and Permo-Mesozoic sequences to the north, over the Middle Miocene sandstones and marls of Valsugana. The most recent tectonic system consists of a set of NNW-SSE to N-S faults which cut across the ENE-WSW Valsugana and E-W Val di Sella fault systems. The N-S Grigno-Tolvà fault cuts across the Cima d'Asta magmatic complex from Val Vanoi to the north to Asiago Plateau to the south over XX km, and dislocates the Belluno and Val di Sella thrust faults at the footwall of the Valsugana fault system. All these faults are still seismically active.

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