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Peridotite-pyroxenite intraplating near the continental Moho (Ivrea-Verbano Zone, Western Alps)

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The Sesia magmatic system from Ivrea-Verbano Zone (hereafter IVZ) comprises intrusive and volcanics rocks of Lower Carboniferous to Upper Permian age (Sinigoi et al., 2010), which are exposed in a virtually complete section across the pre-Mesozoic Adriatic continental crust. Intrusions are present at different stratigraphic levels. Gabbroic to dioritic rocks of the Sesia Mafic Complex intruded the granulite- to amphibolite-facies metasedimentary and metavolcanic rocks of the lower crust. Granitoid plutons are dominant in the adjacent intermediate to upper crustal sequence of the Serie dei Laghi, whose emplacement was accompanied by intermediate to acidic volcanism. Recent investigations have shown that the geodynamic evolution of the northernmost tip of the IVZ (Finero area) involved Triassic-Lower Jurassic magmatic episodes (Zanetti et al., 2013; Schaltegger et al., 2015), thereby suggesting the presence of important geological heterogeneities within IVZ.
This presentation deals with the petrology and the geochemistry of the lower crust intrusions that are geographically intermediate between Sesia and Finero areas. We focus on the so-called Monte Capio sill, which is found near the deepest level of the exposed continental crust, close to the Insubric line. The sill is about 4 km long, spreading from Strona to Sesia valley, and has maximum thickness of 600 m. Peculiar characteristics of the Monte Capio sill are: (i) dominance of ultramafic rocks, and (ii) close association with garnet-bearing gabbros and granulite-facies SiO_2-rich rocks ("stronalites"). U-Pb zircon geochronology returned ages spanning from 314.0 $\pm$ 5.2 to 283.2 $\pm$ 6.0 Ma, which were tentatively interpreted as crystallization and recrystallization ages, respectively (Klotzli et al., 2014).
The Monte Capio sill mostly consists of amphibole-bearing peridotites to pyroxenites. The pyroxenites typically contain Fe-Ni-Cu mineralizations that were exploited in the past century through mine activity. In addition, the pyroxenites locally show variable percentages of plagioclase, which produce a defined pyroxenite to gabbro magmatic layering. The whole sill is frequently crosscut by coarse-grained plagioclase-hornblende dykes. Chemical and isotopic data are currently in progress to define the geochemical signature of the primitive melts, their magmatic evolution and accurate intrusion timing. These information are expected to shed light on the process of continental crustal accretion and on the geodynamic evolution of the IVZ.

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