Geophysical Research Abstracts
Vol. 14, EGU2012-14246, 2012
EGU General Assembly 2012

Evidence for the development of a convergent setting in the Southern Alps domain during the early Mesozoic: insights from the Finero Complex (Ivrea-Verbano Zone)

T. Giovanardi (1), A. Zanetti (2), M. Mazzucchelli (3), M. Tiepolo (2), R. Vannucci (1), and T. Morishita (4)

(1) Dipartimento di Scienze della Terra, Università di Pavia, via Ferrata 1, Italy, (2) IGG-CNR, UOS. Pavia, via Ferrata 1, Italy, (3) Dipartimento di Scienze della Terra - Università di Modena e Reggio Emilia, P.zza S. Eufemia 19, Italy, (4) Frontier Science Organization, Kanazawa University, Kakuma, Kanazawa 920-1192, Japan

The Finero Mafic-Ultramafic Complex is located in the northernmost sector of the Ivrea-Verbano Zone (hereafter IVZ, Southern Alps). It consists of a pervasively metasomatized dunitic-harzburgitic phlogopite-amphibole-rich mantle unit surrounded by a layered and strongly hydrous mafic-ultramafic pluton (the Finero Mafic Complex) that underplated the lower crust of the Adria plate. A number of different geodynamic scenarios, among which i) aborted rifting processes, ii) mantle plume activity and iii) development of a subduction zone, have been proposed to account for the mantle metasomatism and the melts intrusion in the Finero area. All these scenarios, however, are commonly considered from pre-Hercynian to Permian in age, in analogy with the petrogenetic processes which occurred in the central and southern sectors of IVZ. In this contribution, new geochronological and petrochemical data are presented, along with a review of the literature age determinations, which suggest that the metasomatic events of the Finero mantle unit, as well as the emplacement of the layered intrusion, occurred over a time span covering Middle Triassic to Lower Jurassic. Trace element and isotopic evidence point to the occurrence of large amount of crustal component in the melts migrating through the mantle unit, which, consistently with regional structural features, has been proposed to be related development of roll-back subduction during the early Mesozoic. In this scenario, the intrusion of the Finero Mafic Complex predates the mantle metasomatism and occurred during Upper Anisian-Ladinian, as a consequence of the uprising of melts produced by large degrees of fluid-assisted partial melting in a supra-subduction regime. The mantle unit and the mafic-ultramafic complex were tectonically juxtaposed later on, possibly during the opening of the Middle Jurassic Neo-Tethys.