Comparing P-T-t paths across the Beigua Unit, Voltri Ophiolite: implications for the exhumation mechanisms of HP Massifs.

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The issue of how dense high-pressure (HP) metamorphic rocks may be exhumed to the surface has attracted extensive study and a number of mechanisms have been proposed, derived from both numerical modelling [1] and studies of exhumed subduction zone terranes [2]. One such mechanism involves the exhumation of metamorphosed mafic and sedimentary material within a subduction channel, dominated by more ductile and buoyant serpentinite material [1,2].

The Beigua Unit of the Voltri Ophiolite (Ligurian Alps, Italy) consists of metamorphosed serpentinite that hosts lenses of metagabbro and metasedimentary material and has been interpreted to represent a 'fossil' subduction channel [2,3]. Subduction channel structures are predicted to contain a number of characteristics: (1) different P-T histories recorded by blocks over a small spatial scale; (2) different peak and retrograde geochronological records. This study uses integrated Sm-Nd garnet geochronology and P-T analysis to evaluate the Beigua Unit as a possible subduction channel. Multiple lenses of metamorphosed gabbro and associated rodingites are targeted to assess disparities in ages that may result from diachronous incorporation of material from the downgoing slab into the subduction channel.

Preliminary age data for bulk garnet separates from two different blocks of eclogitized Fe-Ti gabbro within the Beigua Unit yields Sm-Nd garnet ages of ca. 35 to 38 Ma. These ages are younger than previous estimates of peak eclogite facies metamorphism, derived from ^{39}Ar-^{40}Ar dating of phengites, from other parts of the Voltri Ophiolite (ca. 43Ma) [2]. The preliminary data for garnets from these samples yield very high $^{147}Sm/^{144}Nd$ ratios (>5), allowing for potential future high precision chronology (<1Myr uncertainty) of individual gabbroic blocks to differentiate metamorphic ages for each gabbroic block and provide insights into subduction interface processes.

[1] Gerya *et al.* (2002) *Tectonics* **21(6)**. [2] Federico *et al.* (2007) *Geology* **35(6)**, 499-502. [3] Malatesta *et al.* (2012) *Tectonophysics* **568**, 102-123.