

# ***Prograde P-T path of eclogitised Permian metasediments (Gran Paradiso massif, western Alps)***

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The tectonic window of the Gran Paradiso massif, like all other internal crystalline massifs, constitutes an invaluable source of data for the understanding of the Alpine mountain belt. Indeed, this window reveals basement-derived gneisses and micaschists located just below the eclogite-bearing oceanic crust and allow us to access to information concerning the stacking of the exhumed units.

The metamorphic history of the Gran Paradiso basement is now relatively well constrained because detailed studies have been performed in the polycyclic, pre-Permian, rocks [*Le Bayon et al., 2006*] as well as in the hornfels developed at the contact with Permian granitoids [*Radulescu, 2008*]. By contrast, the metamorphic history of the monocyclic sediments deposited on top of the Variscan basement is still poorly understood. One opportunity for such a study is the identification of presumed Permian metasediments at the contact between two stacked units within the Gran Paradiso massif [*Le Bayon et Ballèvre, 2006*].

The presumed Permian metasediments essentially consist of ankerite-bearing quartzites to micaschists associated to minor amounts of mafic rocks. The ankerite-bearing metasediments presents many similarities with those coming from Briançonnais basement, like the Moosalp Formation [*Genier et al., 2008*]. In rare cases, metabasic boudins within the micaschists preserve eclogite-facies parageneses. One of these has been studied in detail, because it reveals the presence of a glaucophane fabric included in zoned garnets, sometimes associated with lawsonite pseudomorphs in the more quartz-rich samples. The matrix is constituted by omphacite-dolomite-zoïsite associated with phengite and constitutes the paragenesis at the metamorphic peak. The early, eclogite-facies assemblages in the mafic rocks have been severely overprinted by paragonite then albite-amphibole (“hornblende”)-epidote assemblages, that develop during the main, ductile deformation associated to the East-West trending stretching lineation with top-to the-West senses of shear.

New P-T estimates obtained using THERMOCALC shows that these rocks have been buried from ~ 1.5 GPa-400°C (glaucophane fabric) to ~2.0 GPa-450°C (omphacite fabric) before to be exhumed from ~2.0 GPa-500°C to 1.5 GPa-550°C (paragonite associated to albite and baroisite). This provides an excellent record of the prograde P-T path in the Gran Paradiso, otherwise difficult to decipher. In addition, it confirms the monocyclic character of the ankerite-bearing rocks, hence their potential Permian age.

Consequently, our study shows that, in the Gran Paradiso massif, **(1)** Permian sediments and volcanics record a monocyclic burial-exhumation journey, **(2)** the Permian sediments did not detach from the Variscan basement, **(3)** most of the Mesozoic cover was detached at an early stage of the burial history using the Triassic evaporitic decollement level.

#### References:

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