

## **Monazite petrochronology in Internal Rif units (Beni Bousera, northern Morocco): new insights of Permian and Oligo-Miocene events**

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In the internal units of the Rif belt, Paleozoic HP-HT and Alpine LP-HT metamorphic events were reported in granulitic metapelites surrounding the Beni Bousera peridotites. However, important questions still remain about the precise ages and the geodynamic context of both metamorphic events.

In this study, we present new geochronological results in monazites from granulites of the Beni Bousera unit and gneiss and micaschists from the Filali units of the Lower Sebtides. We combined microprobe analyses, X-ray maps, in situ and in context (i.e. LA-ICPMS in thin section) U-Th-Pb dating of monazite and textural relationships with rock-forming minerals at the thin section scale in order to better constrain the polycyclic metamorphic evolution. In the granulites, monazites included in garnet yield concordant Permian ages between  $278 \pm 5$  Ma and  $285 \pm 3$  Ma. During Alpine times, the matrix monazites are dissolved and recrystallized. The second generation of alpine monazites yields Lower Miocene ages at around 22 Ma. Permian ages are only found in the granulite metapelites close to the peridotite massif, mostly in monazite shielded in garnet. Oligo-Miocene ages, scattered between 21 and 28 Ma, are found in the overlying gneiss and micaschists of the Filali units.

The Oligo-Miocene ages show an intimate relation with an Abukuma type paleo-gradient recorded in all the metamorphic units of the Lower Sebtides, which are interpreted as the evolution the upper plate of a subduction zone. On the other hand, Permian ages recorded in the granulitic metapelites could be related to the first stage of Permo-Triassic rifting.