

## **Neogene Exhumation in the High Atlas of Marrakech (Morocco)**

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The High Atlas is the final product of the polyphasic tectonic inversion of the Atlasic rift basins. To unravel the Alpine tectonic history in the Western High Atlas, where fission-track data are completely lacking, eight samples from a traverse across the High Atlas of Marrakech were analyzed. In this sector of the chain rocks from the Precambrian basement with their Paleozoic to Neogene cover, affected by numerous ENEWSW trending transpressive faults, crop out.

Samples coming from the northern side of the traverse belong to the Paleozoic to Mesozoic sedimentary cover. Samples of the southern side come from the Precambrian Tidili granitoid and from Proterozoic sandstones of the Saghro succession. Apatite fission-track ages span a wide range between 212 Ma and 20 Ma.

At the base of the traverse on the northern side, samples have old ages ranging from 185 and 72 Ma, while samples from the upper portion yielded a younger age of about 20-25 Ma (mean length 13.9  $\mu\text{m}$  and s.d. 1.51  $\mu\text{m}$ ) indicating a fast cooling – exhumation phase from temperatures above about 120°C in early Miocene times. Lower altitude samples with older ages, before early Miocene were at lower temperatures.

Modelling of thermal histories of samples of the southern side seems to indicate that they participated to the early Miocene cooling phase but starting from temperatures well below 120°C at which they resided for a consistent portion of their history (~100-200 myr).

Apatite fission-track data from this study represent the first record of a Miocene rapid cooling-exhumation phase in the High Atlas of Marrakech, which testifies an important tectonic pulse in Miocene times that activated important ENE-WSW trending transpressive faults.