



On the origin of the anomalous elevation in the Atlas Mountains and adjacent regions (Morocco).

B. Ghorbal (1), G. Bertotti (2) and P.A.M. Andriessen (2)

1. Department Isotopengeochemie, V.U. Amsterdam, ISES Netherlands Research Center,
2. Department Tectonic, V.U Amsterdam

(badr.ghorbal@falw.vu.nl)

The High Atlas of Morocco is a Cenozoic intracontinental mountain range resulting from the inversion of a Mesozoic continental rift.

Dominated by thick-skinned thrusting and folding structure, the polyphased building of the High Atlas cannot explain the created structural relief only by shortening induced essentially by the inversion of the Mesozoic extensional fault.

Regarding the moderate tectonic shortening and the geophysical indications of the thin lithosphere, several authors are supporting the suggestion which indicates that the actual topography of the High Atlas could be the expression of the mantle contribution by uplift, mainly in the Ourzellarh massif and its neighborhood. The amplitude and distribution as well as the history and origin of such an anomaly are poorly constrained. Some data, such as the presence of marine sediments of Eocene age at >1000 m of elevation in the Errachidia region demonstrate that the thermal anomaly is not the only process involved.

In our work, we approach the problem along two lines. Firstly we apply apatite fission track and (U-Th)/He dating to derive information on the age and magnitude of exhumation/uplift. Secondly we constrain the amount of vertical displacement accommodated by major faults and folds in the region. Hereby we determine how much of the present day topography is controlled by processes acting at the fault/fold block scale and how much should be ascribed to other processes acting at larger wavelengths.