Geophysical Research Abstracts,
Vol. 11, EGU2009-9442-1, 2009
EGU General Assembly 2009

Late Cretaceous to Present evolution of the NW Africa peri-cratonic in the Africa-Eurasia plate convergence context

B. Ghorbal (1,2), G. Bertotti (3), P.A.M. Andriessen (1,2)

(1) Department of Isotope Geochemistry, VU University Amsterdam, De Boelelaan 1085, 1081 HV Amsterdam, NL (badr.ghorbal@falw.vu.nl), (2) Netherlands Research Centre for Integrated Solid Earth Science (ISES), De Boelelaan 1085, 1081 HV Amsterdam, NL, (3) Department Tectonics, VU University De Boelelaan 1085, 1081 HV Amsterdam, NL

Africa-Eurasia plate convergence is the main mechanism to explain topographic evolution and patterns of Tertiary vertical motions recorded around the entire Mediterranean and even further east. However, most of the studies are concentrated on the Eurasian side of the Mediterranean Realm.
Along the NW Africa pericratonic zone (western Mediterranean side) extending longitudinally from the Anti-Atlas to the Rif Mountains, the highest topography is observed in the High Atlas intracontinental belt and in the Pan-African Anti-Atlas belt, and not in the youngest belt, the Rif.
The combination of AFT and (U-Th)/He low-thermal dating, performed on pre-Cenozoic basement rocks along the Moroccan pericratonic transect (500km) yield ages ranging respectively between 90-9Ma and 65-7Ma, documenting vertical motions of subsidence and exhumation in between Late Cretaceous and Present. Time-Temperature models show that vertical movements are spatially zoned through Morocco, with the highest amplitude of vertical movements in the High Atlas (>4-5km) and more modest amounts in the Anti-Atlas and the Western Meseta (<2.5km) from Late Cretaceous onward.
Precious information provided by the AFT and AHe ages indicates that the entire NW African peri-cratonic zone including the Western Meseta and the Anti-Atlas in addition to the Atlas and the Rif systems experienced Tertiary deformation. Two stages of folding are distinguished on the basis of low-thermal dating results along the pericratonic transect. The first is a lithospherical folding of $\tilde{5}$00km in the Late Cretaceous (confirming that this process is a primary response to recently induced compressional stress fields) and the second is a crustal folding of $\tilde{1}$00-150km wavelength in the Late Eocene that occurred independently to the mantle, requiring therefore the existence of a decoupling in between the base of the crust and the high mantle.