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Tectono-morphic history of mountain-basin systems in Morocco;

Europe-Africa convergence zone.

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NW Africa is situated in the zone of convergence/collision between the African and European plates and forms also the boundary between two very different oceanographic domains, the Atlantic and the Mediterranean. Lithospheric to superficial tectonics and their topographic expression are thus directly tied to interactions between these two marine basins and to the climatic evolution.

In Morocco, similarly to Algeria and Tunisia, convergence and collision have provoked deformation in a $>$1000km wide area stretching from the Mediterranean Sea to the Sahara platform. The region includes three major orogenes of different age and kinematics, the Rif, the Atlas and the Anti Atlas. While horizontal deformations are fairly well constrained, very little is known on vertical movements in general and on patterns of exhumation and uplift in particular. For instance, previous authors have suggested that the spectacular morphology of the Atlas Mountains was created during the last 4-5Myr. In this case, morphology creation would be younger than the major contraction stages thereby raising the question of the motor behind such vertical movements. A major issue is further the apparent contrast between the old age of deformation and the young morphology in the Anti Atlas.

To tackle these issues ISES (Netherlands Research Centre for Integrated Solid Earth Science) has launched a project to perform apatite fission track and (U-Th)/He age

dating along a transect crossing the entire region from the Rif to the Anti Atlas. These methods have closing temperatures of $\sim 120^{\circ}$ and $\sim 60^{\circ}$ respectively and will constrain vertical movements of rocks in the uppermost few kilometers of the Earth's crust. First results will be presented during the EGU General Assembly.

In a later stage, these results will be linked to morphology development and erosion studies. Vertical movements in the mountain belts will eventually be coupled with subsidence studies in intervening basins to derive a quantitative understanding of the processes controlling vertical movements in the SW part of the Africa-Europe convergence zone.