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Block rotation tectonics recorded in the miocene magmatic rocks of "Beni Haoua" area (northern Algeria): preliminary paleomagnetic results.

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The seismic activity of the Western Mediterranean area is partly concentrated in northern Africa, particularly in northern Algeria, as it is shown by the strongest recent earthquakes of “Zemmouri” 21 May 2003 Mw=6.9 and the “El Asnam” 10 October 1980 Ms= 7.3. This seismicity is due to the convergence between Africa and Eurasia plates since at least the Oligocene. This convergence involves a tectonic transpression with N-S to NNW-SSE shortening direction, which is expressed by active deformation along the plate boundary.
In Algeria, the seismicity is concentrated in a coastal zone (the Tell Atlas) in the northern part of the country. Active structures define there NE-SW trending folds and NE-SW sinistral transpressive faults, which affect the intermountain and coastal Neogene to Quaternary sedimentary basins (e.g. “ Cheliff ”basin, “ Mitidja ”basin, . . .). These reverse faults are coupled with NW-SE to E-W trending strike-slip deep faults. The active deformation in northern Algeria could thus be explained by a kinematics model of blocks rotation: the transpression tectonics with NNW-SSE direction of convergence defines NE-SW oriented blocks, which have been possibly subjected to clockwise rotation.
A previous study mentioned the existence of block rotations in the central and eastern part of the “Cheliff” basin (Derder et al, 2010), from Neogene sedimentary formations, despite the very weak intensity of the Natural Remanent Magnetization (NRM) measured on the samples, and the frequently observed magnetization instability during the thermal demagnetization. Because paleomagnetic results expected from magmatic rocks are often more accurate than those obtained from sedimentary rocks, and in order to complete the study of “Cheliff” basin, a paleomagnetic investigation was conducted on the miocene andesites rocks cropping out along the northern coastal zone of this basin ("Beni Haoua" area). The study is still in progress, but the preliminary results show that paleomagnetic rotations have affected different sites of the studied area.
Following previous data from the central and eastern part of the “Cheliff” basin (Derder et al, 2010), and those from “Mitidja” basin (central northern Algeria) (Derder et al, 2009), these new data confirm that the deformation related to the convergence between the Africa and Eurasia plates is partly accommodated in northern Africa by blocks rotations.

References:

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