Structure, paleogeographic inheritance and deformation history of the southern Atlas foreland fold-and-thrust belt of Tunisia

A. Saïd[1, 2], P. Baby[1], D. Chardon[1], J. Ouali[2]

[1] GET (IRD, CNRS), Université Toulouse III, 14 avenue Edouard Belin, 31400 Toulouse, France

[2] Laboratoire 3E, École nationale d'ingénieurs de Sfax, Université de Sfax, BP W, 3038 Sfax, Tunisie

Structural analysis of the Southern Tunisian Atlas was carried out using field observation, seismic interpretation and cross-sections balancing. It shows a mix of thick-skinned and thin-skinned tectonics with lateral variations in regional structural geometry and amounts of shortening controlled by NW-SE oblique ramps and tear faults. It confirms the role of the Late Triassic-Early Jurassic rifting inheritance in the structuring of the active foreland fold and thrust belt of the Southern Tunisian Atlas, in particular in the development of NW-SE oblique structures as the Gafsa fault. The Late Triassic-Early Jurassic structural pattern is characterized by a family of first order NW-SE trending normal faults dipping to the east and by second order E-W trending normal faults limiting a complex system of grabens and horsts. These faults have been inverted during two contractional tectonic events. The first event occurred between the Middle Turonian and the Late Maastrichtian and can be correlated with the onset of the convergence between Africa and Eurasia. The second event corresponding to the principal shortening tectonic event in the Southern Atlas started in the Serravalian-Tortonian and is still active. During the Neogene, the Southern Atlas foreland fold and thrust belt propagated on the evaporitic décollement level infilling the Late Triassic-Early Jurassic rift. The major Eocene "Atlas event" described in hinterland domains and in the Eastern Tunisia did not deform significantly the Southern Tunisian Atlas, which corresponded in this period to a backbulge broad depozone.

Structural traps can be associated to deep inverted structures involving possible Paleozoic petroleum systems. Further studies should be carried out to specify the structural geometries of deep inverted structures and confirm the presence of Paleozoic sedimentary series under the Tunisian Southern Atlas.