



## **Late Miocene extensional systems in northern Tunisia and their relation with SE directed delamination of the African subcontinental mantle lithosphere**

Guillermo Booth-Rea (1), Seif Gaidi (2), Fetheddine Melki (2), Vicente Pérez-Peña (1), Wissem Marzougui (3), Jose Miguel Azañón (1), and Jorge Pedro Galve (1)

(1) University of Granada, Geodinámica, Granada, Spain (gbooth@ugr.es), (2) Geologie Structurale et Appliquée, Département de Géologie, Université de Tunis el Manar, (3) Office National des Mines, Tunisia

Recent work has proposed the delamination of the subcontinental mantle lithosphere under northern Tunisia during the late Miocene. This process is required to explain the present location of the Tunisian segment of the African slab, imaged by seismic tomography, hanging under the Gulf of Gabes to the south of Tunisia. Thus, having retreated towards the SE several hundred km from its original position under the Tellian-Atlas nappe contact that crops out along the north of Tunisia. However, no tectonic structures have been described which could be related to this mechanism of lithospheric mantle peeling. Here we describe for the first time extensional fault systems in northern Tunisia that strongly thinned the Tellian nappes, exhuming rocks from the Tunisian Atlas in the core of folded extensional detachments. Two normal fault systems with sub-orthogonal extensional transport occur. These were active during the late Miocene associated to the extrusion of 13 Ma granodiorite and 9 Ma rhyodacite in the footwall of the Nefza detachment. We have differentiated an extensional system formed by low-angle normal faults with NE- and SW-directed transport cutting through the Early to Middle Miocene Tellian nappen stack and a later system of low and high-angle normal faults that cuts down into the underlying Tunisian Atlas units with SE-directed transport, which root in the Nefza detachment. Both normal fault systems have been later folded and cut by thrusts during Plio-Quaternary NW-SE directed compression. These findings change the interpretation of the tectonic evolution of Tunisia that has always been framed in a transpressive to compressive setting, manifesting the extensional effects of Late Miocene lithospheric mantle delamination under northern Tunisia.