

### **Importance of the Early Cretaceous Exhumation of the Western African Craton for the Oil Exploration**

Ghorbal, Badr <sup>1</sup>; Andriessen, Paul <sup>2</sup> (1) Tectonic/Isotope Geochemistry, VU Amsterdam, Amsterdam, Netherlands. (2) Isotope Geochemistry, VU Amsterdam, Amsterdam, Netherlands.

An amount of more than 500m of Lower Cretaceous terrigenous sediments in most basins along the NW Africa continental margins indicates a major episode of erosion during the post-rift period in the Central Atlantic and Alpine Tethys realms.

The cause of the terrigenous interval and the source of the sediments, representing an important oil reservoir in NW Africa extending from Morocco to Guinea remain underdetermined and unclear.

Recent and new apatite Fission-Track (AFT) and (U-Th)/He low-temperature thermochronology analyses performed on pre-Mesozoic basement rocks outcropping along the eastern Central Atlantic Realm document an unexpected widespread exhumation during the Middle-Late Jurassic to early Late Cretaceous, with AFT and (U-Th)/He ages ranging respectively between 270-120Ma and 170-100Ma (Malusà et al. et al., 2007; Ghorbal et al., 2008; Sadiqqi et al., 2008; Balestrieri et al., 2009). A significant cluster of Late Jurassic/Early Cretaceous apparent ages obtained in the Moroccan Meseta, the Atlas domains and the Anti-Atlas belt designates that, considering the proximity of the depositional basins these domains may be the potential source areas for the detritic sediments.

Additionally, AFT analyses performed on pre-Mesozoic basement rocks further east near to the Ougerta Massif (in Algeria) show AFT results similar to the ones obtained in Morocco, suggesting that the Late Jurassic-Early Cretaceous exhumation of the basement could be the source of the terrigenous sediments, which constitutes the oil reservoir there.

According to ongoing and recent studies applying combined low-temperature thermochronological tools on basement rocks from NW Africa, suggest that perhaps a widespread exhumation at the scale of the Western African Craton (WAC) occurred during Early Cretaceous times. Anyway these new insights strongly indicate a relationship between the Early Cretaceous vertical movements of the WAC and the large lower Cretaceous detritic sediments (due to the erosion) deposited on its margins. Results suggest that most of the basins located near to the WAC may be characterized by a high oil potential and show the interest of regional studies to localize such basins for oil exploration.