

## **Some Insights from Hydrocarbon Exploration on the Geodynamics of the Ne Mediterranean**

**Lucien Montadert<sup>1</sup>, Stelios Nicolaidis<sup>2</sup>, and Stavros Arsenikos<sup>1</sup>**

<sup>1</sup>Beicip-Franlab, Rueil-Malmaison 92502, France

<sup>2</sup>Ministry of Energy, Commerce and Industry (Cyprus), Nicosia, Cyprus

### **Abstract**

Development of Offshore Exploration for Hydrocarbons in the E Mediterranean implied intensive acquisition of 2D and 3D seismic reflection data. It contributed not only to the definition of plays and prospects for Exploration but at another scale, to a better understanding of the Geodynamic History of the area. This will be illustrated in this presentation. One of the major novelties was the recognition that the formation of the E Mediterranean Mesozoic NeoTethys was quite different from what was supposed before, that is resulting from the northward drift along Arabia of a Taurus Block detached from Africa. On the contrary, it is now established that the N Africa Margin was a transform margin shaped by oblique transfer-transform faults, WSW-ENE oriented, while the Levant Margin was a passive margin. This is in accordance with the left-lateral motion of Eurasia relative to Africa during the Jurassic- E Cretaceous. This scenario explains the detachment of the Eratosthenes Continental Block (ECB) from Arabia and the formation of the thick Levant and Herodotus Mesozoic Basins. Nature of the ECB is now better understood. Syn-rift tilted Blocks are visible covered by three shallow-water carbonate platforms: Mid-Jurassic, Late Jurassic-Early Cretaceous and Miocene restricted to the top of Eratosthenes. They are separated by periods of drowning with deeper pelagic carbonates deposition due to relative sea-level rises. It was a large island during the Messinian Sea Level Drop as indicated by the pinch-out of the Messinian Evaporites all around. The regional tectonic pattern changed completely in the Upper Cretaceous with the change in plates motion and the convergence of Africa and Eurasia. It resulted in the formation along a subduction zone, of the Cyprus Arc, a south-vergent thrust belt of ophiolites and Mesozoic sediments, running continuously from Northern Arabia to Antalya through the Cyprus Island. Marine surveys show that subduction was active during the Paleogene. Finally, an important event occurred in the Miocene with consequences in large parts of the E Mediterranean offshore. It was the process of separation of Arabia from Africa and the emergence of the Dead Sea Transform Fault (DSTF). Surveys show that the change to a strike-slip regime created along the Levant since the L Miocene a large zone of shearing west of the DSTF and to the North, provoked the westward escape of the Anatolian Block in the Late Miocene, bounded southward along the Cyprus Arc by the strike-slip Latakia Ridge. Remarkably, these changes were at the origin of a strong shortening event around the Burdigalian, SE-NW oriented, which deformed the Levant Basin and the Eratosthenes carbonate platform. Same regional stress orientation seems to have persisted in the Miocene and possibly the Plio-Quaternary with a dense network of SE-NW oriented compaction faults.