

Petroleum Systems and Geodynamics of the Algerian Margin

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This paper summarizes the current knowledge of the Algerian northern margin corresponding to the southern part of the Western Mediterranean Sea. The geodynamic evolution of this margin and its continental borderlands is explained within the framework of the European and African plate convergence. This evolution is characterized by a polyphased, complex deformation. The most available and realistic kinematic scenario considers the continental parts of the Algerian margin as the hinterland zone (Kabylian crustal blocks) formerly linked to the southern European margin. Through time (In middle Miocene times, the crustal blocks have drifted to be inserted to Africa, while the deposits of the African active margin were accreted, stacked and transported, forming a series of flysch nappes.

The subduction of the Maghrebien Ocean, and later 18 Ma, the collision of Kabylian blocks with the Tell-Atlas were followed by a tectonic inversion of the Algerian margin which is highlighted by the various existing data from several recent cruises (SPIRAL, MARADJA 1 and 2): morpho-bathymetry, geology, geophysics and seismology. The main geodynamic events and the petroleum systems are summarized and discussed. The various data interpretation shows two main petroleum systems (post- and pre- Messinian). However, various traps are recognized such as a tilted blocks, ramp folds and Messinian diapirs. There would be other traps related to the Messinian deposition and Quaternary turbiditic sedimentary wedges at the foot slope of the margin.

New bathymetric data from oceanographic survey (SPIRAL, MARADJA 1 and 2) indicate that the main parts of the petroleum systems and the structural traps lay in the deep water, exceeding 2600 m. The main petroleum system parameters (sources, reservoirs, seals, timing and traps) still require a characterization. In order to progress in the knowledge of this margin and to lead to a reliable evaluation of the petroleum potential, a workflow will be proposed.