Modelling Test of a Subsidence: Example of the Ksour Basin during the Jurassic (203-137 MA) (Western Saharian Atlas, Algeria)

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The basin of ksour is situated in the western part of the Algerian Saharan Atlas. It is limited by the northern atlasic fracture in North and the southern atlasic fracture in South. It is marked by carbonated and silico-clastic filling during the Jurassic period thus testifying the diversity of the sedimentary environments.

In the aim to study the geodynamic evolution of this basin during the interval 203-137 Ma, quantification and modeling tests of subsidence completed by isopach and isobath maps is carried out in four sectors (Aïn Ben Khelil, Mekalis, Aïn Ouarka and Kerdacha). The results obtained are summarized as follows:

During the liasic period (203-174 Ma), the basin of Ksour is characterized by a progressive tectonic subsidence which constitutes a response to the tectonics of the tilting blocks type (maximum available space and an acceleration of subsidence in the Mekalis, Aïn Ouarka and Aïn Ben Khelil areas).

Differentiation between depocenters, expressed here by the isopach and isobath maps, is related to the important role of the local (tectonics of tilted blocks type), regional and global (the Atlantic opening) factors.

During this interval (174-154 Ma), the heterochrony between the sedimentary deposits in the center and on the margins of the basin did not last a long time. We can assist at the beginning in the Upper Bajocian to an arrival of the silicoclastic material (Delta Ksour installation) which announces the beginning of the closing of the basin.

During the interval (154-137 Ma), the sedimentary signature (quality and thickness of deposits) testifies in favour of a generalized closing of the Ksour basin. This situation persists for all the period of the lower Cretaceous. This subsidence quantification test completes the results obtained by AIT OUALI (1991, 1995) concerning modalities of the Ksour basin opening during the liassic which belongs to Jurassic rifting in the Maghreb.

Key words: Ksour basin, Algeria, Jurassic, Geodynamic evolution, Subsidence modelling, Isopachs, Isobaths, Depocenter.