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Structural Style Associated Structures on Occidental Saharan Atlas and Petroleum Implications (Algeria)

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SUMMARY

The study area is located at west of Algeria, straddling two different geological domains, the Saharan Platform in the south and the Alpine domain in the north.

Two major Faults (South Mesitian Fault and South Atlasic Fault) subdivide the area in three geodynamically and tectonically distinct domains, High Plateaus, Occidental Saharan Atlas and Saharan Platform (or Bennoud Trough). Three stratigraphic columns are build to illustrate the stratigraphic series' nature and thickness variation of the geodynamic provinces.

So as to set off the geometry of the Saharan Atlas associated structures, we've draw up dips domains sections perpendicular to the tectonic transport direction. The interpretation of these sections in depth, including wells and seismic data, permitted us to set up three regional equilibrated structural sections. These shows that the present structure of the Saharan Atlas is the result of regional NW-SE and N-S compressional direction which prevails since the Late Eocene and it illustrated by Fault-bend fold and Fault-propagation fold. Salt tectonic, in some cases, complicate structures.

In Bennoud Trough, the two established regional transect evidencing two distinct zones; a calm zone in the south and a structured one in the north near the Saharan Atlas.

The majors faults had an important role in the provinces' geodynamic evolution created during the distension stage (Trias-Upper Cretaceous). Each province had his own subsidence ratio and petroleum system.

So, the discovery of hydrocarbons in the Occidental Saharan Atlas is possible if the structural style is taken into consideration. Structures geometry in depth must be defined before drilling, because the appearance and disappearance of traps depends on the evolution of the folds. Hydrocarbons accumulations can be trapped at the top of the major fold or in it's slices.