

## **Integrated Seismic Interpretation of Cenomanian Reef Buildups, Contribution of Seismic Attributes. Pelagian Basin, Offshore Tunisia**

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### **Abstract**

Determining locations and geometries of subsurface reefs as well as carbonate accumulations having unusual porosity and permeability became a challenge on geophysical exploration (Chopra, 2007). In this context, seismic attributes represent an advanced tool that leads the reservoir characterization and the reef build ups imaging. The present study is focused on Isis oil field located in the eastern Tunisian offshore. It consists of an integrated subsurface study based on well data and 2D and 3D seismic data. The main objective is to delineate the Cenomanian reef structure recognized in the study area as a good stratigraphic reservoir. Our methodology is based on seismic interpretation, seismic facies analysis and seismic attribute application. Calibrated and interpreted seismic sections shows a tilted block trapping style within the Cretaceous interval with the presence of a locally high Cenomanian structures. In addition, we identify the existence of some mounded bodies occupying the boundaries of Grabens. These mounded shapes are recognized by their chaotic facies and their seismic terminations that rests against the body. The integration of well data enables us to interpret these facies as a Cenomanian build up. Indeed, the drilled wells on the study area prove the existence of a reef deposition facies expressing the same configuration. Several seismic attributes were computed to highlight the structural architecture of studied area and especially the buildup construction signature. Variance attribute evidences the NW-SE faults and delineate the Isis Graben. The buildup bedding configuration was characterized based on the instantaneous attribute. Calibrated attributes enable us to further believe that the mounded identified buildups provide a good analog with the proven Isis reef structure. The revealed results reflect the efficiency of the applied attributes in reef reservoir characterization. Spectral decomposition methods (FFT and CWT) were also applied to further characterize the identified constructions. The results show the close relation between “tuning frequency and thickness variation, the low frequency reflect the thickening of the reservoir rock. Finally, a depositional facies model defining the basin architecture and the carbonate buildups distribution was established using the integration of all the applied tools.