

Seismic Reflection Data: Identification of Reef Versus Volcanic Intrusion in the Tunisian Pelagian Platform During Cretaceous

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Abstract

Due to the decline in the oil capacity, more interest is given to complex petroleum system and challenging reservoirs to increase hydrocarbon production. One of the most sought-after, are the reef and reef-related deposit due to the recent discoveries within carbonate platform in the Levantine basin in the Eastern Mediterranean Sea. The studied area, is located in the centre of Pelagian platform, offshore Tunisia. We appraise the Cretaceous reservoirs by means of 18 wells, approximately 5000 km of 2D seismic and 20 sq.km of 3D seismic lines. A proven Campanian-Maastrichtian (Abiod Formation) and Turonian-Santonian (Miskar Formation) reservoirs are producing gas from neighbourhood fields (Chergui, Miskar). Also, Cenomanian reef bioconstruction is oil producing in Isis field. Hence, we focus on identifying the reef build-up or lens, to highlight the prospectivity in offshore Tunisia. Based on many works and data (reports, wells log, aeromagnetic map...), the studied area contains intra-cretaceous volcanic rocks. The issue was that features bodies can be easily confused with reef build up or even seismic anomalies. So, the idea to distinguish both imprint one from the other. Our starting point is, features identified at the wells, then the seismic stratigraphy step for interpretation to understand the facies distribution and the change of the reservoir characteristics. We consider its depositional environment inducing variation in the seismic signature. Thenceforward, seismic attribute is applied to decorticate signal and improve image. In addition, a reef analogue is found in the onshore (the Borj Cedria region). It was the aim of a fieldtrip held in June 2021 for a detailed study. Obviously, the result of the identification, is more reliable in 3D seismic data and can allows better extraction of reef or volcanic intrusion. This evaluation permits more synthesis of the geological event, recognizing volcanic and reef in seismic section, to enhance the prospectivity of stratigraphic traps in offshore Tunisia