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Brian Taylor¹, Thomas L. Patton¹, Nacera Maache² (1) BP Exploration, Sunbury on Thames, United Kingdom (2) Sonatrach, Sunbury on Thames, United Kingdom

3D Visualization of a Coherence Volume - Tiguentourine and La Reculee Culminations, Southern Algeria

Sonatrach and BP have recently initiated an exploitation program for the gas-condensate, Cambro-Ordovician reservoirs of the Tiguentourine and La Reculee (TLR) fields in the Illizi basin of southern Algeria. In these efforts, 3D visualization serves to provide three fundamental functions: 1) a vehicle for communicating within multidisciplinary subsurface teams; 2) an operations tool to assist in drilling and completions; and 3) an interpretive aid providing both heuristic models and an environment for testing new data sets and concepts. In this presentation and a companion presentation (Patton et al.), we explore these functions, emphasizing the interpretive applications.

The use of 3D visualization technology with two levels of coherence data on the TLR 3D survey provides a detailed insight into structural and stratigraphic issues in the Cambro-Ordovician section of the TLR field. Three-dimensional visualization of conventional coherence extractions provides a readily observable level of detail that proves difficult to capture using traditional interpretive techniques. Four principal fault trends are identified including a WNW-ESE trend, which was not previously recognised in this area using conventional seismic techniques. This trend is important for its association with open fractures identified in two wells. The visualization of weaker coherence elements - using a combination of seismic processing, opacity editing and voxbody interpretation - provides insight into stratigraphic (e.g. depositional patterns; facies boundaries) and structural (e.g. refined fault geometries; potential fracture fabrics) expressions important in development decisions, including static models for reservoir modelling. Other visualisation and collaboration techniques provide the ability to share the interpretation with team members remote from the subsurface team's office in Sunbury.