Paper P28

Pre-Tertiary Fractured Basement of Mega Host Block A, Malays Basin in Light of Current 3D Seismic Data Interpretation

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Pre-Tertiary fractured Basement in Mega host block A, Malay Basin is a large high meta- sediment structure, which became the considering HC objective for a long time. Since 1973 when the first time Oil has been discovered in the Basement by A-01 well, ten Exploration wells named from A-01 to A-10 have been drilled to penetrate inside the basement with different depths. Different well results for the basement target shows that distribution and characters of fracture systems are very complicated and many studies covering different disciplines have been performed to determine the HC potential of the Basement for the area. In this paper the authors would like to present new results of 3D seismic data interpretation to predict high HC potential zones in the study area. Some of the presented data have been applied to design the latest basement appraisal wells for the area with promising results.

The study area is covered by a large 3D seismic survey, which was acquired by eight streamers of 4800m length with acquisition bin side of 6.25m X 18.75 m. The 3D seismic data initially was processed by 3D PSTM processing sequence and then was reprocessed by both Kirchhoff PSDM and Beam PSDM methods. Good imaging of top and inside Pre-Tertiary Basement provided by 3D Beam PSDM processing (Figure 1) permit us to apply the "From seismic interpretation to tectonic reconstruction" method, which was presented with more detail in the November 2009 AAPG' IEC in Rio de Janeiro, Brazil to get detail basement mapping and to predict the fault systems with high potential of generating the large aperture (Macro) fractures.

Besides of macro fractures, others fracture characters as: Fracture density, continue & intersection of different fracture systems were also tried to be predicted. For this purpose a large number of 3D seismic attributes have been tested, at the results, relative Acoustic Impedance was considered as the best attribute for prediction of high fracture density areas and reasonable attribute to predict the continue and intersection of different fracture systems (Figure 2). To predict the continue and intersection of different fracture systems, ant tracking attribute which was generated by new work flow proposed by the authors was considered better (Figure 3).

Based on integration of the above seismic attributes, in the mega basement host block A different areas with different fracture characters and consequently different HC potential were identified and outlined. Well data have been used to check and to confirm the predicted results.
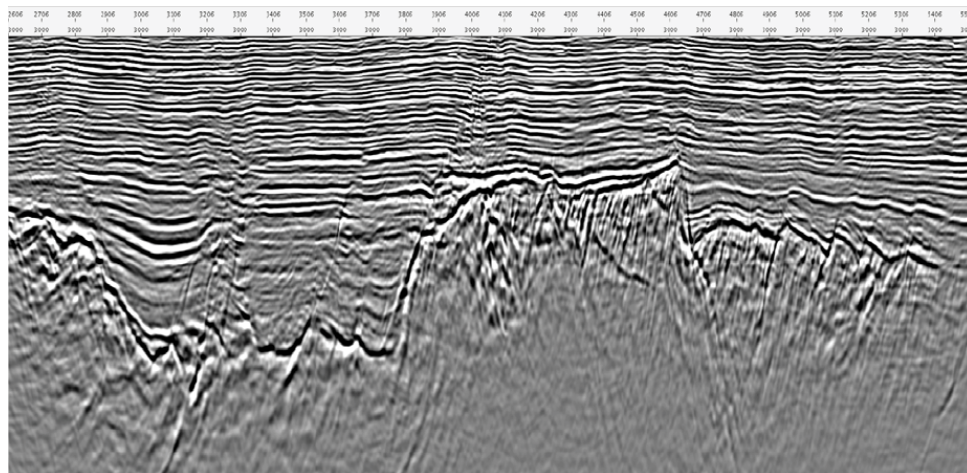

Figure 1: Good imaging of top and inside Pre-Tertiary basement of 3D seismic section processed by Beam PSDM.
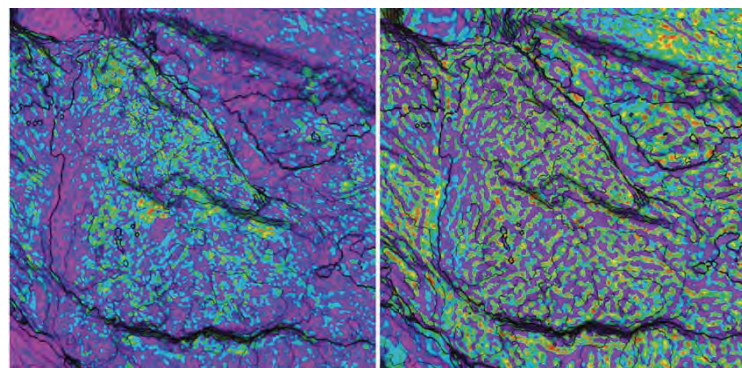

Figure2: Ave. Magnitude RAI attribute (Left) could predict high fracture density zones, while Maximum Amplitude RAI attribute (right) could predict continue & intersection of different fracture systems.
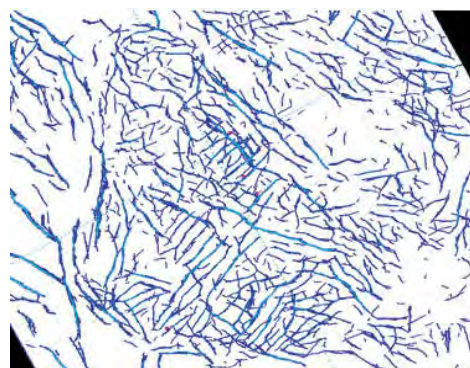
Figure 3: Ant Tracking Time Slice better images continue and intersection of different fracture systems.