



POSTER PRESENTATION

New Plays and Concepts for Offshore Sarawak from FTG Gravity Data

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High resolution airborne Full Tensor Gravity Gradiometry (FTG) data is currently being acquired across all producing basins offshore Malaysia as part of a multiclient programme by Bell Geospace and PETRONAS. The data is proving instrumental, from calibration of signal over existing producing structures, to predicting prospectivity at deeper intervals. Two such areas are the Tatau Half-Grabens and Luconia provinces off Sarawak and are discussed in this poster.

Depth-Density estimation tools for working with FTG data transform the Gravity Tensor field into a subsurface model using a Layer Migration methodology. The basic concept assumes empirical relationships between signal character and depth sensitivity that, through steering by density relationships, are transformed to a set of informed sub-surface models.

The Tatau Half-Grabens area is characterized by a series of elongated extensional half-grabens and fault blocks and are expressed in the FTG data as a series of negative and positive anomaly patterns respectively. Recent work in the area establishes prospectivity at Top Pre-Cycle I basement with the 2015 Nuang discovery well along the edge of a shallow fault block. The known fault block and half-graben geometry acts as the primary source to the FTG signal and through usage of Layer Migration, depth to basement is mapped across the area. The results indicate that the half-grabens reach depths ranging from 2 to 5 km facilitating the development of good source rock material. In addition, fault block geometries are mapped laterally and predict complex shapes.

The Luconia province is characterized by extensive development of highly prospective Carbonate build-ups on top of more extensive carbonate platforms. The many fields in production emanate from those at Top Cycle IV at depths varying from 800 to 1200 m below sea level. However, what is poorly understood is the location of underlying source rocks and migratory pathways that feed these high-quality reservoirs. The FTG data shows remarkable clarity from imagery of the Top Cycle IV carbonates to more subtle anomaly patterns arising from structural controls and sub-carbonate geology. Data analysis predicts the presence of a carbonate reef complex at depths from 3 to 5 km. The reef complex is described as an atoll shaped structure yielding a rim shaped positive anomaly centred by a negative response, some 75 km in diameter and surrounded by a low amplitude negative anomalous response interpreted as sediment-sourced.

This poster will present and describe the depth-density models and implications for prospectivity across the Tatau Half-Grabens & Luconia provinces.