Seismic Stratigraphy and Petroleum Systems of the Canning Basin, Northwest Shelf, Western Australia

Christopher Yule[1]
[1]James Cook University, Geophysics, Townsville, Australia
chrisyule93@gmail.com

ABSTRACT

The Canning Basin in Western Australia is classified as a frontier basin with significant petroleum potential. The sediment package is up to 15km thick with ages ranging from Ordovician to Quaternary. The Fitzroy Trough of the onshore Canning Basin has been studied extensively and has produced commercial quantities of hydrocarbons from Palaeozoic reservoirs, however, its offshore equivalent, the Oobagooma Sub-Basin remains poorly studied. This project will improve the understanding of the stratigraphy and tectonic history of the Canning Basin with a focus on connecting the known onshore stratigraphy of the Fitzroy Trough to the offshore stratigraphy of the Oobagooma Sub-Basin. This will be achieved by using a combination of historic and newly acquired offshore and onshore 2D deep-seismic data with well data that intersects petroleum systems. To efficiently and effectively assess offshore hydrocarbon potential, a seamless onshore/offshore 3D model will be developed to accurately map known prospective stratigraphic units in the Fitzroy Trough with equivalent units in the Oobagooma Sub-Basin. The dating of volcanic and detrital zircons via LA-ICP-MS will be implemented to better constrain stratigraphic ages using offshore wells. These zircons will be sourced from drill core and will significantly enhance the precision for ages of key stratigraphic units and correlations between wells that are currently based on biostratigraphy. Ultimately, this project aims to improve petroleum exploration outcomes in the offshore Canning Basin through an improved understanding of the regional stratigraphy and structures in both prospective sub-basins.

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