

Crustal Structure of the Guyana Basin Based on High-Resolution Seismic and 2D Gravity Modeling

Mark Longacre¹

¹MBL/PGS

ABSTRACT

This study, based on the integration of high-resolution long offset seismic and 2D gravity modeling, has determined the crustal structure and depth to Moho for the Guyana Basin offshore Guyana. Three (3) gravity models have been generated showing the different crustal types associated with the two tectonic phases, Jurassic and Cretaceous, for opening of the basin. The NW-SE Central Atlantic opening generated Jurassic aged oceanic crust and resulted in a transform margin in relation to the Guyana Craton continental crust. That Jurassic aged crust transitions from a typical oceanic crust near the border with Venezuela to a “transitional” crust near the border with Suriname. A second transform margin exists between the Jurassic oceanic crust and the Cretaceous oceanic crust that formed during the opening of the Equatorial Atlantic. Mapping the crustal thickness, crustal type, crustal boundaries, and depth to Moho is extremely important to understanding the tectonic evolution of the basin and its impact on hydrocarbon generation.