

Carbonate Prospect Identification and Delineation in Southwestern Venezuela by Seismic Attributes

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ABSTRACT

In early days, seismic data were used to understand the structural shape, in maps, of the layers in the subsoil (reservoirs, source rocks, etc.). Nowadays, depleted producer reservoirs are studied with seismic attributes to find new structural and/or stratigraphic hydrocarbon traps. In this sense, this project concentrates on how seismic imaging and attribute analysis can be used to investigate new stratigraphic traps in two carbonate reservoirs (G and E formation) in Southwestern Venezuela. With Petrel software by Schlumberger, Amplitude-related attributes are used to find a contrast between carbonate and siliciclastic rocks, due to their amplitude response is bigger than the background rocks (shale or sandstones). Furthermore, the P Impedance, Sweetness and Envelope cubes, were performed to delineate the calcareous bodies and finally, the Genetic Inversion attribute was used to obtain density and porosity characterization of the possible prospect in the area. Concluding, the amplitude-related attributes are a powerful tool to discriminate between calcareous and siliciclastic rocks, but do not work with calcareous and dolomitized rocks. The use of multiattributes and geological merge could lead to better prospect identification and contribute to exploration success. In fact, there are five prospect with more than 165 km² with similar properties showed by the well UB-1X probed on G formation.

Key words: Southwestern Venezuela, Amplitude related attributes, P Impedance, Sweetness, Envelope, Genetic Inversion, Petrel software.