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Gathering Seismic Attribute Analysis Techniques to Refine Prospective Area Limits

We present an application of seismic attribute analysis techniques to provide support for prospects evaluation, at level of early cretaceous rocks, in an area located at western Venezuela. A main fault divides the study area in two blocks: west (down) and east (up). All known early cretaceous reservoirs are situated in the west side in which oil production is controlled by presence of fractures. This has been deduced due to production rising after acidification. For prospective zones, placed in both blocks, the goal was to predict the presence and density of fractures. Acimuthal AVO technique was not feasible to be used because prestack seismic data has improper offsets and acimuth covering. Instead, coherence volume was obtained to identify, inside of prospective zones, discontinuities where fractures have more probability to be present. Then, the similarity analysis technique was applied to classify seismic response, related to six producing wells and one dry well. Because we could not be able to correlate results from both techniques with well data, we decided to combine them. We observed an agreement between high seismic similarity trends, according to producing wells, and zones with moderate to high presence of discontinuities. From this, we inferred seismic response could be related to rock properties associated with fracture presence. Additionally, results showed insights to identify a new zone of interest, which was not considered before this study. Final results were integrated with other available information to refine limits and extensions of prospective areas and gave support to reduce exploration uncertainties.