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Facies recognition using Wavelet Based Fractal Analysis and Waveform Classifier at the Oritupano A field, Venezuela

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We have used a Wavelet Based Fractal Analysis (WBFA) and a Waveform Classifier (WC) to recognize litofacies at the Oritupano A field, Venezuela. The WBFA was applied first to Sonic, Density, Gamma Ray and Porosity logs in the area. The logs which better response to fractal parameters are the Gamma Ray and Porosity. In this case, the lithological content could be associated to the fractal parameters slope, intercept and fractal dimension. The maps obtained using the fractal dimension shows tendencies that agree with the depositional system previously observed in conventional geological maps. According to the results obtained, zones with fractal dimension values lower than 1 correspond to sandstones channels, values between 1 and 1.2 coincide with interdistributary deltaic shelf and values greater than 1.2 could be associated with zones of greater shale content. The use of WBFA and Waveform Classifier applied directly to the seismic data, shows no relation between fractal parameters and/or WC results and lithofacies. The lost of low and high frequency in the seismic data, as well as phase problems, could be the reason for this behavior.