



FESAus Monthly Technical Meeting

“Advanced Electrofacies modelling and Permeability Prediction:

A case study incorporating multi-resolution core, NMR and image log textural information into a carbonate facies study”

Diego Vasquez, Paradigm

Abstract:

Evaluating Carbonate reservoirs is a challenging endeavor, not only due to the heterogeneity of the pore system, but to the fact that some changes can be overlooked using conventional logs. Despite core data being a source of direct comparison to calibrate a petrophysical analysis in such reservoirs, its cost makes it impractical to acquire on each well.

To effectively account for the high heterogeneity of the rock fabric and changes in permeability on the reservoir, a methodology has been implemented by PDVSA INTEVEP in collaboration with Paradigm to evaluate a carbonate gas and condensate reservoir, located offshore in West Venezuela. This reservoir despite of presenting porosity values uniformly distributed, shows a high variability on permeabilities. For this study a reference well was selected, including Core data, Microresistivity Images and NMR data. Microresistivity images were used to quantify with high resolution the rock fabric changes seen on the formation, while using the whole NMR T2 distribution allowed accounting for changes on the pore system. This information was then combined with standard petrophysical logs and core facies using the Multi Resolution Graph-Based clustering method, to produce detailed electrofacies models, focus on honouring the rock fabric and pore distribution in the reservoir.

These detailed electrofacies models constructed that honour fabric and pore system changes in the formation, and that were calibrated with core data, allowed predicting permeabilities on sections of the well not covered by the original core, as well as to neighbouring wells, where no core data was available.



About the Presenter:

Diego Vasquez holds a BS degree on Geological Engineering from the Central University of Venezuela. He started his career shortly as Production Geologist, before becoming a Borehole Geologist for two of the main Wireline services providers, allowing him to gain a combined experience of over six years on this area. During this time, he completed the interpretation of hundreds of Wireline images across several different basins in South America, to obtain Structural, Stratigraphic and Petrophysical data. He was involved in the processing of Logging While Drilling (LWD) data including images for real time structural data helping Geosteering in high profile boreholes. Diego is currently a Technical Advisor in the Reservoir Characterization domain for the Paradigm Asia-Pacific region, based in Perth, Western Australia.

DATE: Tuesday 14th June 2016, 12:00 – 1:30 PM **VENUE:** Hotel IBIS- 334 Murray Street, Perth

COST: Members \$30.00; Non Members \$40.00; Students/Retirees \$10.00

Online registration at www.fesaus.org

Note: limited seats for unregistered attendees may be available: \$50.00 cash door charge

