

## Rock typing for seismic inversion using rock physics models

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Solving geophysical inversion problems involves supplying prior information to tackle non-uniqueness of the solution. Some advanced inversion algorithms require this prior in a form of statistical models that account for depth dependence of physical rock properties. But where do these models come from and how to identify their parameters objectively? Traditionally, identifying a suitable functional relationship between burial depth and rock properties among the plethora of possible models for each of the expected rock types in a subsurface formation is achieved by manually tuning the model parameters to satisfactory describe the borehole data in low dimensional data representations such as cross-plots. Here, instead, we present an objective and robust method that automatically identifies rock types from the borehole data by fitting models from rock physics model library and estimates the parameters of statistical model that are required in seismic inversion algorithms. We illustrate the performance of our method on a field data from the appraisal well in Satyr field offshore Australia (Figure 1).

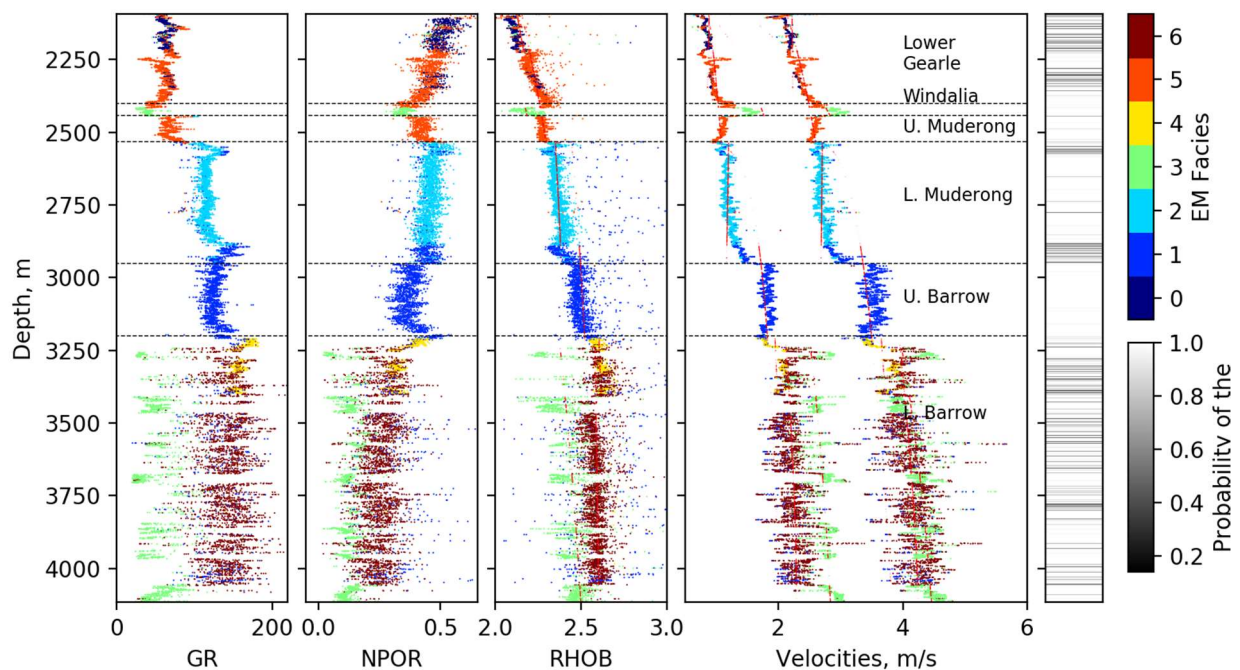


Figure 1. Results of automatic rock typing using Satyr-5 well data. Colour-coding represents different rock types identified by the algorithm. Dashed red lines illustrate corresponding rock physics model trends. Dashed black lines indicate formation tops from geological interpretation.