Laminated and thinly-bedded sands have become an important target of exploration offshore Malaysia. In such reservoirs, the vertical resolution of standard logs is usually insufficient to allow the direct measurement of the properties of each individual thin bed. In particular, the resistivity of thin sands is reduced by the high conductivity of silt and clay laminations, and a conventional petrophysical analysis of these sequences may underestimate the hydrocarbon volumes.

Solutions to this problem require to record high resolution logs, to further enhance log vertical resolution with special processing methods, and to use adapted interpretation methods. We describe in this paper 2 methods of Laminated Sand Analysis (LSA):

- Resistivity Anisotropy: this method consists in the measurement of vertical and horizontal resistivities to calculate the true resistivity of the laminated sand and silt/clay layers. The volumes of hydrocarbon in the sand and the silt/clay fractions are summed up to obtain the total hydrocarbon volume in the laminated sand.
- Log resolution enhanced by borehole image: this method uses bed geometry information from a high resolution borehole resistivity image to invert for the true log responses in each layer. The high resolution squared logs are processed in a petrophysical solver to calculate the various reservoir properties, including the hydrocarbon volume of each individual thin bed.

These 2 methods of Laminated Sand Analysis are performed on log data from Malaysia, and the results are compared to a conventional evaluation. The range of application of these methods is discussed in relation to the geometry and texture of thin beds.
Comparison of hydrocarbon volumes from conventional analysis (standard resolution logs), resistivity anisotropy analysis, and image enhanced analysis (log resolution enhanced from borehole image).