AVO Forward Modeling for a Carbonate Reservoir
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Wibi Aulia Harsum (University of Oslo)

SUMMARY

None

AVO Forward Modeling for a Carbonate Reservoir

A very thick carbonate reservoir that have been karstified and filled with gas is overlaid by a thick layer of shale. There is no influence of tuning thickness by lithology in all five wells drilled in this field. Therefore, AVO forward modeling is considered to be one of the studies performed in this field.

Carbonate pore types are formed by depositional, diagenetic, or fracture processes such that the spatial distribution of porosity may or may not conform to depositional facies boundaries (Ahr, 2008). It makes the wells drilled not necessarily show the same pattern of velocities and other seismic attributes as they may have undergone different forming of pore types.

From the studies, cross plot between porosity and P wave shows very small separation. A slightly larger separation trend is shown by a cross plot between P wave and Sw against depth. Shear wave shows a slight increase due to gas presence. Poisson's ratio in the upper part of the carbonate shows much lower values (< 0.3) rather than shale above. Eventually, AB plot and a chart of reflection coefficient against angle show the differences between gas carbonate and brine carbonate. This forward modeling can then be considered when analyzing the seismic data in the area.