

# AVO Analysis of Detecting Submarine Gas Hydrate in Lower Fangliao Basin, SW Taiwan

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## Abstract

Amplitude versus offset (AVO) analysis provides an accurate method to identify gas hydrate and possible occurrence mechanism. The ultimate goal is to determine type of rock and associate petro-physical parameters including fluid content, porosity, density and seismic velocity. Aerial distribution of hydrate can be easily identified through AVO attributes. A bottom simulating reflector (BSR) which sub-parallel to the seafloor topography with reverse polarity compare to sea-floor reflection is a helpful hint to identify the presence of gas hydrate. The preliminary features indicate the presence of hydrate layer within the sediments is that the velocity will increase and also generating a strong reflector on top of gas hydrate stability zone. My study focus on MCS937-10 data in lower Fangliao Basin, Taiwan

In this study, Amplitude preserved seismic data processing with compensation of geometrical spreading loss were required and avoid artificial influence on the waveform. Velocity refinements were conducted by converting offset gathers to angle gathers. Synthetic AVO study confirms the AVO theory that the gas sand exhibit reduction of reflection coefficient with increasing incidence angle. For real data application, the AVO analysis under CMP gather at specific location acquired in the lower Fangliao Basin were investigated in order to confirm the presence of gas hydrate. Preliminary studies indicate that BSR responses show a Class III AVO effect. The AVO effects occur mainly due to the presence of free gas-bearing zone usually trapped by the overlying hydrate formations. AVO analysis is performed on reflection event around CDP 774 and TWT 2250 mili-second can be observed with indication of gas supply from below show distinct AVO anomaly. The AVO anomalies were identified from both gradient analysis and intercept and gradient cross-plot. The gradient curve shows Class III AVO response indicating the free gas beneath a high velocity layer, in this case, gas hydrate. The existence of gas hydrate in lower Fangliao Basin can be confirmed by AVO analysis.

## References

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