Thesis Title	Detection of Gas in Sandstone Reservoirs Using Amplitude Versus Offset Attributes Analysis in an Area of Malay Basin, Gulf of Thailand
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ABSTRACT

Amplitude versus offset (AVO) has become an important interpretation tool for the detection of hydrocarbons and reservoir description. The objective of this study is to detect gas in sandstone reservoir using amplitude versus offset attribute analysis and geophysical well log data. The location of the study area is at the Malay basin, the Gulf of Thailand and it cover an area of about 150 km^2. Amplitude crossplot of 3D seismic data set (near and mid angle stack) were used for AVO analysis.

The rock properties of interesting reservoirs from Well 1 and 2 were presented by crossplot of well logs. P-wave velocity, density, Poisson's and acoustic impedance of gas sand A, B, C and D from well 1 and 2 are lower than the encasing shale, but S-wave velocity is similar to the water sand and encasing shale. The resistivity of the gas sands are higher when compare with water sand or shale.

P-wave velocity, S-wave velocity, density and check shot data are used to create the AVO model by Zoeppritz equation. The top of the elastic model of gas

sands displayed a trough at normal incidence and the magnitude of the amplitude increase with increasing offset. The crossplot of intercept and gradient of AVO synthetic attribute of well 1 and 2 show cluster or "wet trend" about the origin and anomalous values in the first and third quadrants, which correspond to class III AVO anomalies.

The near and mid angle stacked amplitude crossplot of gas sands and background showed the gas sand trends deviated and rotated anticlockwise from the background trends that suggested that amplitude increasing with offset due to gas effect. The RMS amplitude volume of gas sand A, B, C and D window showed distribution of each sand and new potential area of hydrocarbon accumulation. The amplitude crossplot of near and mid angle stack presented the trend of top and base from all prospects that are deviated from background trend. The result of AVO analysis is that all of gas sands anomaly trend deviated from background trend by anticlockwise rotation.

In this case, the AVO attributes match the models for the corresponding gas sands. They are an invaluable tool for hydrocarbon exploration in class III sands in the study area.