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AVO Analysis of a Shallow Gas Accumulation in the Marmara Sea

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In recent years, Amplitude versus Offset-AVO analysis is widely used in determination and classification of gas anomalies from wide-offset seismic data. Bright spots which are among the significant factors in determining the hydrocarbon accumulations, can also be determined sucessfully using AVO analysis. A bright spot anomaly were identified on the multi-channel seismic data collected by R/V K. Piri Reis research vessel in the Marmara Sea in 2008. On prestack seismic data, the associated AVO anomalies are clearly identified on the supergathers. Near- and far-offset stack sections are plotted to show the amplitudes changes at different offsets and the bright amplitudes were observed on the far-offset stack. AVO analysis was applied to the observed bright spot anomaly following the standart data processing steps. The analysis includes the preparation of Intercept, Gradient and Fluid Factor sections of AVO attribues. Top and base boundaries of gas bearing sediment were shown by intercept – gradient crossplot method. 1D modelling was also performed to show AVO classes and models were compared with the analysis results. It is interpreted that the bright spot anomaly arises from a shallow gas accumulation. In addition, the gas saturation from P-wave velocity was also estimated by the analysis. AVO analysis indicated Class 3 and Class 4 AVO anomalies observed on the bright spot anomaly.