EAGE

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# Prediction of hydrocarbon saturation by results of Simultaneous seismic inversion in a carbonate reservoir

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## SUMMARY

Sophisticated techniques such as Amplitude Versus Angle (AVA) Simultaneous Inversion are required to provide Acoustic Impedance (AI), Shear Impedance (SI), density and compressional to shear velocity ratio (Vp/Vs) profiles in which outputs would lead to reliable reservoir discrimination.
AVA simultaneous inversion has been utilized for inversion of a 2D seismic profile using one deep exploration well aimed at revealing lateral variations of the Lower Cretaceous Fahliyan carbonate reservoir (SW Iran). The purpose is also to investigate possible relationships between Lamé parameters and hydrocarbon saturation in the carbonate reservoir.
Transforming of offset dependent CDP gathers to angle dependent gathers, extracting angle dependent wavelets, producing three angle gathers, construction of initial model and finally simultaneous seismic inversion are stages which have been done in this study.
A direct relationship is seen between water saturation (SW) and Lamé parameters in carbonate reservoir. In contrast, indirect relationship with MuRho (MR) and SW is seen in clastic rocks. This study confirms the applicability of AVA simultaneous inversion and Lamé parameter computation in uncovering lateral variations of hydrocarbon saturation within a carbonate reservoir.