

Summary

Broadband acquisition techniques coupled with advanced reservoir-friendly processing deliver a signal characterized by larger frequency bandwidth which offers imaging of both near-surface and deeper targets. Although the positive impact of broadband data cannot be denied, questions are still raised by the industry (Charron et al. 2015). Inverting such data has opened new challenges for reservoir geophysicists and interpreters. One of these challenges is our ability to analyse the first few octaves and assess phase stability. White et al. (2014) and Schakel et al. (2014) have discussed and illustrated this issue when we are extracting wavelet based on well data. Acoustic Impedance is commonly used to control low frequency content of seismic data, we propose to extract and analyse P-impedance and Poisson ratio to qualify the uplift of acquiring very low frequencies.

This presentation aims to illustrate the impact of processing, wavelet extraction and low frequency model on our capacity to predict elastic property using pre-stack seismic data. We have applied model based seismic inversion (Coulon et al. 2006) on 2D seismic data sets. Seismic data was acquired offshore Australia using conventional flat tow streamer and broadband variable depth streamer. Three wells with full suite of logs are available to control and validate the inversion process. The two data sets have been processed with different processing sequences. Flat tow streamer data was processed with a conventional flow and with pre-migration deghosting. Broadband data was processed using different approaches too. We have applied pre-stack model based inversion using several set of wavelets as well as low frequency models. We will present the impact of acquisition, processing and inversion process (e.g. wavelet extraction, low frequency model) comparing elastic parameter prediction and Bayesian classification results.

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