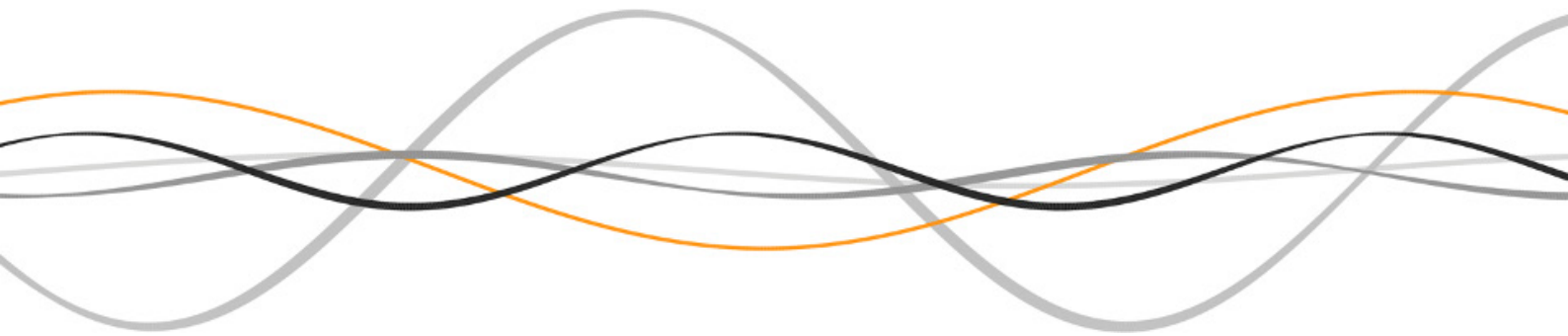# Quantitative interpretation
beyond elastic

From seismic to reservoir properties

Reflection seismic data is a key tool for exploration and development of oil and gas resources offshore and onshore.

Instead of talking about amplitudes, frequency content, and multiples, we deliver geology and provide both key static and dynamic reservoir properties.

Cutting-edge technology development

Qeye has developed all the code, which promotes:

- A streamlined and flexible workflow
- Meets the needs of specific project challenges efficiently
- Bespoke solutions and the possibility for extensive and iterative testing

Optimal results through a circular workflow

Inversion processing sequences are presented as linear workflows, however our project execution is a circular, where any step in the processing sequence will tested by performing an actual inversion and use the match between the results and well log data as the parameter for deciding the quality of each inversion step.

All types of seismic data

Qeye can process and invert any type of 2D, 3D and 4D seismic data including PP/PS:

- Any number of angles stacks
- An arbitrary number of azimuths
- Baseline and any number of monitor surveys

Seismic data conditioning

Any project will always start with a review of the seismic data quality. Conditioning of the data through warping, noise suppression and other techniques in general results in substantially improved inversion results.
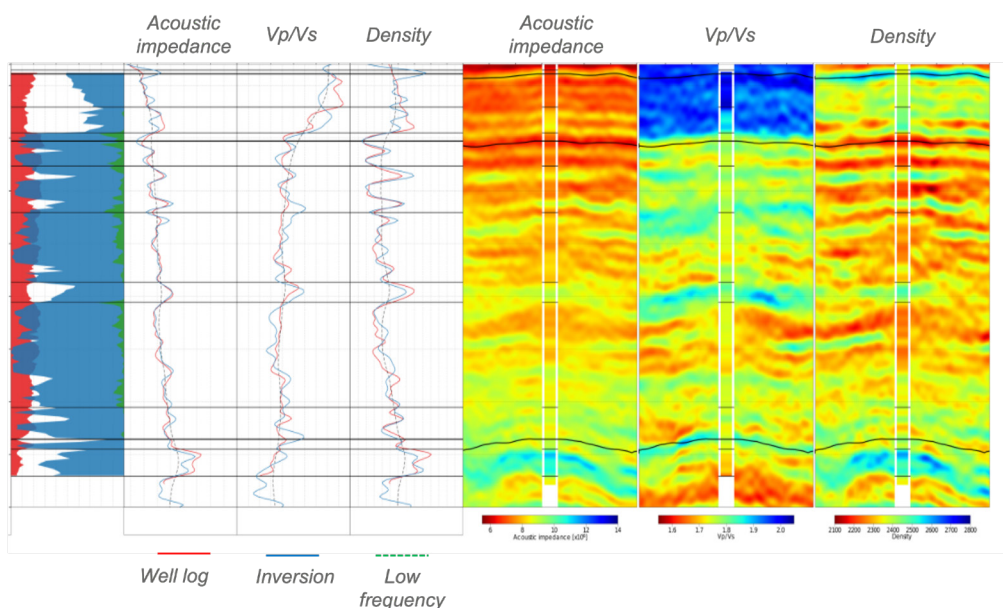

Simultaneous AVO inversion QC plot. The first panel shows well information. To evaluate the validity of the seismic inversion results two types of panels where well log data and inversion results are compared

Seismic inversion beyond the elastic domain for static reservoir properties

In the simultaneous AVO inversion elastic properties are predicted; acoustic impedance, Vp/Vs and in many cases even density as well as the petrophysical parameters; porosity, volume of clay and water saturation.

Prediction of dynamic reservoir properties from 4D seismic

Any number of angle stacks and vintages (baseline and monitor surveys) can be inverted using the simultaneous AVO inversion for the initial reservoir properties porosity and hydrocarbon saturation and changes in hydrocarbon saturation and in some cases even pressure for each monitor survey.

Δ amplitude ~10%
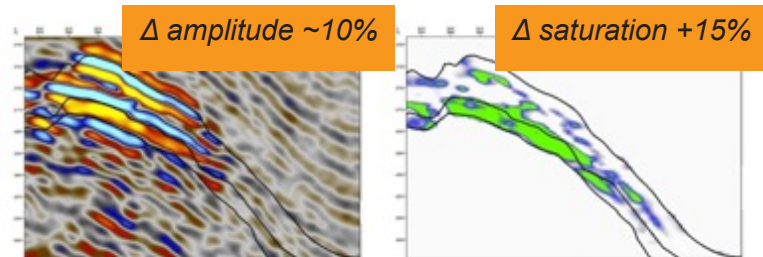
Δ saturation +15%

Time-lapse amplitude information which through the 4D inversion has been calculated to represent a +15% saturation change

A massive amount of seismic through multiple vintages 4D and well data can through the processing be condensed into a few but highly valuable reservoir property volumes.

0.0   0.2   0.4   0.6   0.8   1.0
probability (unitless)
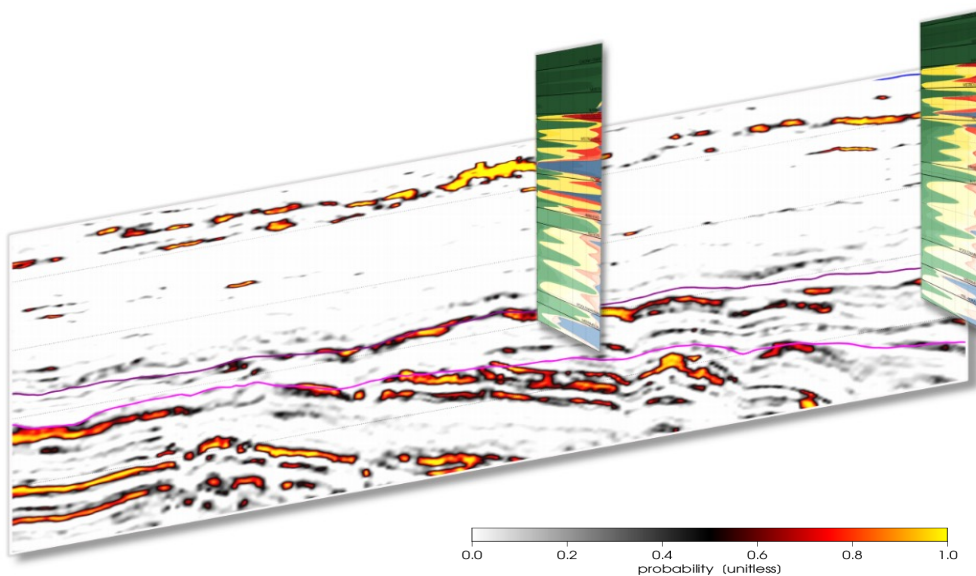
Direct Probabilistic Inversion used the estimate the probability of cemented sands and with the

well-tie probability panel of each of the defined facies

Direct Probabilistic Inversion for facies prediction with probabilities

Seismic data poses a lot of challenges. It is noisy and band limited, a number of facies and fluid configurations are similar in the elastic domain and in the elastic domain space it is laterally and vertically unaware.

Direct Probabilistic Inversion can overcome these challenges as well as making it possible to integrate geological knowledge in the processing sequence.

Direct Probabilistic Inversion uses a Bayesian inference approach. uncertainties. The final result is probability density functions for the defined facies.

Global footprint and unique solutions

With project experience across the world in all geological settings, both onshore and offshore, and a global presence we are ready to optimize your seismic data and deliver valuable subsurface information to support your oil and gas exploration and development efforts.

We can help you with well log editing and analysis, seismic to well ties, seismic data conditioning, lithology and fluid prediction 2D and 3D AVO, rock physics, AVAZ, time lapse 4D, AVAZ simultaneous AVO inversion and Direct Probabilistic Inversion.

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Use the QR code to learn more

Global project map

Copenhagen – Calgary – Houston – Perth – Kuala Lumpur