

SynthRock

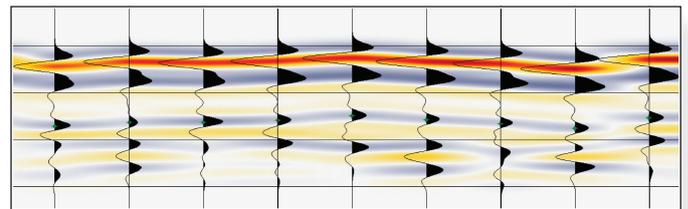
Integrating Rock Physics, Geology & Seismic

SynthRock is dGB's new and powerful toolkit for creating and using forward models in qualitative and quantitative seismic interpretation studies.



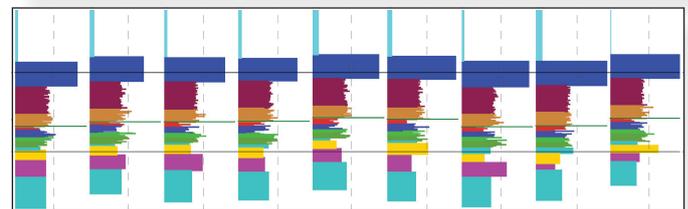
Forward models

Are used to understand the seismic response in terms of geologic variations. Geoscientists can use SynthRock in "what-if" scenarios, or to build a stochastic database of pseudo-wells to invert the data.



Supported Features

SynthRock makes full use of the power of OpendTect, dGB's industry leading open source seismic interpretation software, to support a range of cutting edge modeling and inversion workflows.

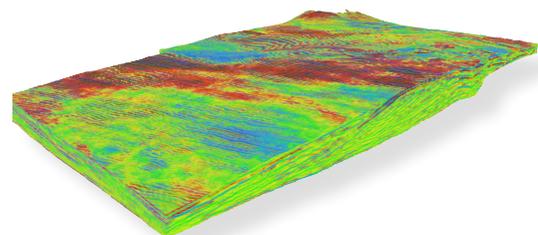


Modeling options

- **Profile module** for the creation of cross-sections from existing wells with manual updates of model parameters
- **Stochastic module** for stochastically varying pseudo-wells
- **Volume module** for the creation of synthetic seismic volume from geomodel
- **Pre-stack** synthetics: PP, PS; near, mid, far, full & angle stacks, optionally with multiples
- **Rock-physics library, fluid-replacement, Probability Density Functions from cross-plots, interactive scaling** and more

Inversion options

- **The HitCube:** a trace-matching inversion procedure to create rock property volumes with associated uncertainties.
- **Neural Networks:** a non-linear approach to predict rock property volumes (requires a Neural Networks plugin license).



SynthRock

As a plugin to OpendTect, SynthRock users can benefit from all OpendTect supported features to create highly sophisticated modeling and inversion workflows. Relevant tools include OpendTect's attribute engine, well data manipulations, cross-plotting, synthetic-to-seismic tying and wavelet extraction. In addition, SynthRock generates a litho-stratigraphic framework that can be used as a starting point for forward modeling within the OpendTect environment.



Creating Simple Wedge Models

Simple wedge models can be created in the open source part of OpendTect. Models are built from a limited number of layers in which model parameters are varied laterally. SynthRock users can create realistic pre-stack synthetics using a high quality ray-tracer and investigate hydrocarbon effects (e.g. AVO anomalies) through the Biot-Gassmann equation.

Profile Module to Create Pseudo-Wells

The profile module allows the construction of 2D cross-sections like channels or ridges using real well data. From one or more real wells, a profile of pseudo-wells is created by interpolating/extrapolating well logs from the starting well positions with the user having full control over all model parameters. The profile module is ideally suited for analyzing hydrocarbon effects (e.g. flat spots) that are observed/enhanced through the Fluid Contact Finder plugin.

Create synthetic seismic with the Volume module

Acoustic or elastic property volumes (e.g. AI, SI) can be used to generate synthetic seismic (both post and pre-stack) that can be compared with real data. These volumes can be either products of seismic inversion or geomodels created using interpreted horizons and/or well logs inside OpendTect's "Volume Builder".

Stochastic Module for Seismic Inversion

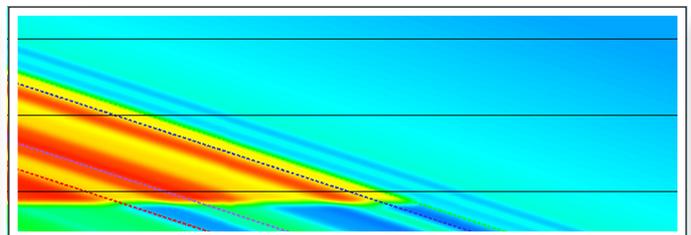
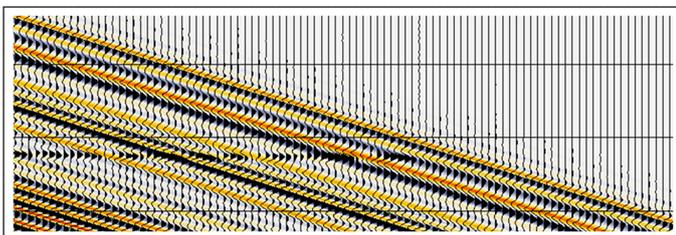
The stochastic module is used to create thousands of pseudo-wells for seismic inversion purposes. After advanced data analysis and with geologic insight, the pseudo-well data base generated truly captures all geologic and seismic variations in the target interval.

HitCube Inversion to Create Probability Volumes

The HitCube inversion is a stochastic inversion where pseudo-well synthetics are matched against measured seismic response. It can be achieved using 3D or 4D survey. The best scoring models are statistically analyzed to generate probability volumes of relevant reservoir properties with their uncertainties.

The OpendTect Geophysics Inversion & Rock Properties Package includes:

Dip Steering, HorizonCube, Deterministic Inversion, Stochastic Inversion, Seismic Coloured Inversion, Seismic Spectral Blueing, Seismic Net Pay, SynthRock, Neural Networks, CLAS Lite, PDF-3D, Workstation Access



Head office:

Nijverheidstraat 11-2
7511 JM Enschede
The Netherlands

Phone: +31 53 4315155
Fax: +31 53 4315104
E-mail: info@dgbes.com

dGB has offices in: Houston - USA, Mumbai - India and Rio de Janeiro - Brazil.

For a complete, multi-volume attribute and seismic interpretation solution contact dGB Earth Sciences at info@dgbes.com