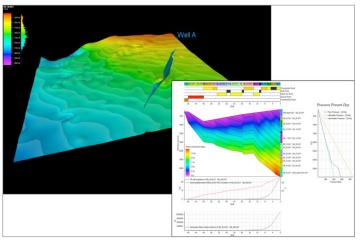# PetroMod 2015 Core System

Advanced features of the PetroMod cores

PetroMod* petroleum systems modeling software combines seismic, well, and geological interpretation to model the evolution of a sedimentary basin. Simulations in PetroMod software help to predict pressures and temperatures, as well as assess if, and how, a reservoir has been charged with hydrocarbons.

The simulations also predict the timing of hydrocarbon generation, migration routes, quantities, and hydrocarbon type in the subsurface and at surface conditions. PetroMod software provides a standardized user interface across the entire 1D, 2D, and 3D modeling workflows. The same simulator is used with all technical features and tools available and identical in all dimensions, ensuring full compatibility.

Integration with the Petrel platform

PetroMod software enables 3D geocellular models built in the 2015 version of the Petrel* E&P software platform. These models contain detailed facies and property distributions, to be incorporated for dynamic forward modeling, hydrocarbon generation, and flow simulation.

Geocellular models built in Petrel 2015 contain detailed facies and property distributions that can be incorporated into PetroMod software for dynamic forward modeling.

Petroleum systems modelers using the Petrel platform's facies modeling tools have access to powerful distribution techniques to represent the subsurface according to analogues and geological concepts, while honoring data trends and distributions. These detailed facies descriptions significantly enhance temperature and pressure prediction, and hydrocarbon charge analysis of a petroleum system.

PetroMod 3D simulation cases can be prepared in the Petrel platform, with the simulation started direct from Petrel 2015. The simulation results are available in the Petrel platform or PetroMod software and can be used for further analysis in context of the original geophysical or well data.

PetroMod cores include model building tools and multi-1D to full 2D/3D pressure/temperature simulation capabilities. PetroMod software includes a database of reaction kinetics to predict the phases and properties of hydrocarbons generated from source rocks of various types, as well as editors to include customized source rock kinetics, hydrocarbon components, and lithologies.
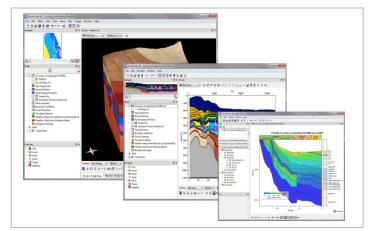
Multicomponent kinetic models can be combined with flowpath migration simulation—a ray tracing method to analyze simple buoyancy driven flow. In addition, expulsion and adsorption models describe the release of generated hydrocarbons into the free pore space of the source rock.

PetroMod 1D core

PetroMod 1D enables the input data and model setup, simulation, and output of results to be performed within one application. The 1D capabilities support single-point data (wells and pseudo-wells) which can be constructed from scratch, imported from the Petrel platform or the PetroMod Well Editor, or extracted directly from PetroMod 2D and 3D models. It can be used as a standalone tool or as an integrated component of PetroMod 2D and 3D.

Calibrated wells with results—such as heat flow trends—can subsequently be used directly by the 2D and 3D simulators. Using this method, pressure and temperature modelling calibration is performed efficiently in all workflows.
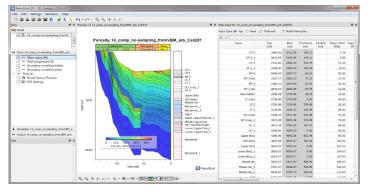
The output results offer a choice between numerous calculated overlays and plots (depth, time, and burial), and allow the display of input and output data adjacent to each other. The results page offers an ideal canvas for preparation of presentations.

PetroMod software provides a standardized user interface across all 1D, 2D, and 3D modeling workflows.

PetroMod 2015 Core System

PetroMod 2D core

PetroMod 2D is primarily applied in areas with sparse data, where a geological section in 2D ideally captures all relevant information and can be used to quickly develop and test conceptual models. It is particularly suited for structurally complex areas for fast simulation results and to gain a better understanding of the region prior to constructing a 3D model. PetroMod 2D software is also routinely applied in areas with dense data coverage if rapid analysis is desired, and for pressure prediction work with full 2D temperature and pressure simulations and preliminary charge evaluations.
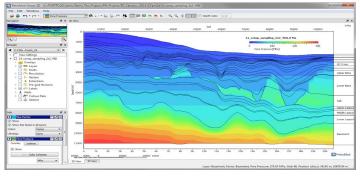

Data input, model setup, simulation, and results output capabilities—all provided in a single application.

PetroMod 3D core

PetroMod 3D enables the full 3D assessment of pressure and temperature in a sedimentary basin through geological time. The results can be used to achieve the following:
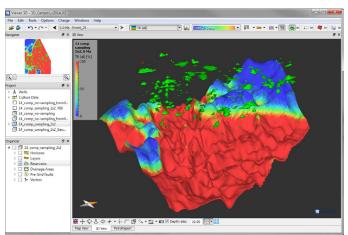
- Enhance pore pressure prediction for seismic velocity inversion
- Improve imaging processes
- Predict drilling hazards in early stages of exploration
- Provide detailed assessment of maturation, generation, and expulsion of hydrocarbons

The PetroMod 2D core software provides rapid analysis in complex areas of sparse or dense coverage.

The input model can be enhanced when built together with the detailed description of source rocks based on the source rock characterization processes in the Petrel platform. The 3D capabilities also enable fast flowpath migration simulation, which provides a rapid assessment tool for drainage areas, and fill and spill analysis of a petroleum play.

Full 3D petroleum systems modeling in a deepwater exploration area in which temperatures, pressures, and petroleum properties in both post- and presalt plays are routinely predicted with PetroMod software. All core and advanced migration simulator components can also be licensed individually to allow customized solutions for individual challenges.

The PetroMod 3D core enables full 3D assessment of pressure and temperature in a sedimentary basin through geological time.

Specifications

PetroMod software is available on all hardware platforms running Microsoft Windows 7 (64-bit) or Red Hat Enterprise Linux 6.4 (64-bit) operating systems. PetroMod software provides the same interface, functionality, and binary data formats on all platforms, meaning input/output files can be easily transferred within mixed hardware systems.

slb.com/PetroMod

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