PRODUCT SHEET

CougarFlow™

AHM & Uncertainty Analysis

CougarFlow is a versatile package to efficiently optimize your reservoir or petroleum system models and to thoroughly analyze the associated risks: quantifying uncertainties on reservoir production forecasts, performing assisted history matching or assessing the risk on hydrocarbon accumulations in a regional basin model. CougarFlow allows for safer and enlightened decision making.

Uncertainty analysis & AHM for reservoir models

Through a multiple realizations approach based on experimental design and state of the art optimization algorithms, CougarFlow aims at reducing the number of simulation runs to properly explore the possible solutions. CougarFlow is usable for any type of numerical simulation at both basin and reservoir scales. CougarFlow allows:

- A thorough screening of uncertainties on a given range of input parameters and their influence on key simulation outputs;
- Uncertainty analysis for quantifying parameters impact and associated optimization;
- For reservoir simulation, rapid and robust Assisted History Match offering both a fast converging gradient method (local optimizer) and a thorough Bayesian approach (global optimizer).

Finally, by integrating the whole set of uncertainties related to a reservoir study - from geological to engineering or even economical parameters - into a complete risk analysis and optimization workflow, CougarFlow provides you with a better grasp of the key influential parameters of a reservoir study and allows for safer decision

Risk & Sensitivity Analysis for Stratigraphic Modeling and Regional Petroleum System Modeling

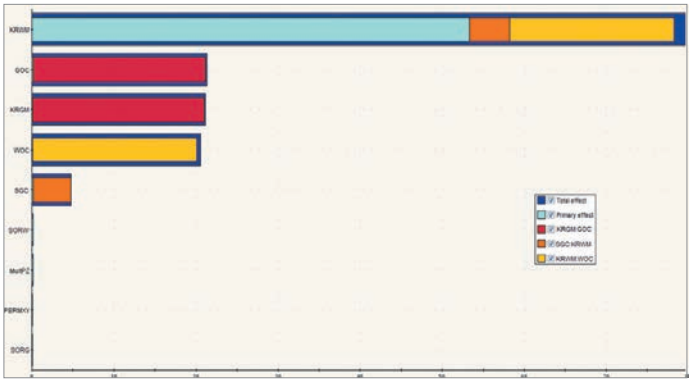
Seamlessly linked to Beicip-Franlab stratigraphic modeling software DionisosFlow and basin modeling package TemisFlow, CougarFlow features effective sensitivity and risk analysis. It encompasses the full range of intimately-coupled phenomena controlling hydrocarbon fluids occurrence in sedimentary basins, from the stratigraphic architecture and facies distribution up to the trapped hydrocarbon charge and quality.

Combining experimental design and response surface methodologies, CougarFlow is one of the few affordable solutions to reliably express DionisosFlow and TemisFlow results in a probabilistic manner.

CougarFlow eases uncertainty quantification and model optimization by offering a systematic and rigorous approach. It allows users to explore their models beyond the conventional best and worst case concept, for enlightened decision making.

Key Benefits

- **Flexible and integrated workflows for screening, uncertainty quantification and model optimization**
- **Handling both static and dynamic uncertain parameters**
- **Open to third-party packages : geomodelers (Petrel™) - reservoir simulators (PumaFlow, ECLIPSE™, VIP/ Nexus™, CMG™) - OpenFlow Suite modules (FracaFlow, TemisFlow, DionisosFlow)**
- **Applicable to reservoir and regional (Basin Modeling) models**
- **Innovative and proven algorithms for AHM, using a custom gradient-method for efficient optimization and a Bayesian approach for thorough investigation**
- **Easy data and scenario management with powerful QC and visualization tools**



The Parameter Contribution plot displays the contribution of each uncertain parameter and their main interactions. It is used to determine the most influential parameters on the response.

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