

FRACA-HM

A Joint Industry Project

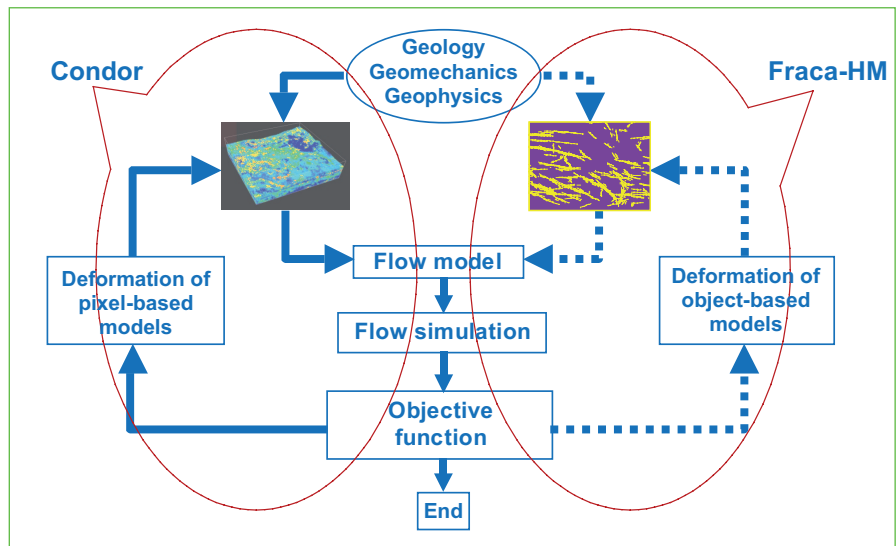
Calibration of Faulted and Fractured Reservoir Models

Objectives

The key to effective management of fractured reservoirs lies in a thorough understanding of the geometry and conductive properties of the fracture network. The objective of the Fraca-HM project is to deliver a robust history matching solution for fractured reservoirs. The project is based on a consistent integration of the geological modeling procedure for fractured reservoirs and our newly developed method for gradually deforming object-based stochastic reservoir models.

Program

The emphasis of the project is on building a consistent and efficient methodology for history matching of stochastic models of fractured reservoirs at the scale of fracture swarms and sub-seismic faults. This methodology will include algorithms for generating sub-seismic faults and fracture swarms, for building petrophysical models and flow simulation models, and for modifying the geometry and the conductive properties of sub-seismic faults



Workflow for calibrating fractured and faulted reservoir models by constraining to dynamic data.

(gradual migration of non-stationary Poisson point patterns, gradual deformation of objects, density map, etc.).

Based on the encouraging results obtained in a preproject, the work program of Fraca-HM will include the following main research topics:

- extension of the gradual deformation methodology to 3D;

- improvement of the geological model of fracture networks;
- simultaneous inversion of geometrical and petrophysical properties of fracture networks;
- use of a more accurate fluid flow simulation method to take fluid exchange between matrix and large scale fracture through small scale fractures into account.

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The work program also includes the development of a software prototype. This prototype will be plugged into the Condor™ software, so as to benefit from its user-friendly graphic interface.

Moreover, the Fraca-HM methodology and the prototype software will be validated on a synthetic or real fractured reservoir field.

Deliverables

The deliverables of this project will be a consistent and efficient methodology, as well as software prototype with a user-friendly graphic interface for the history matching of stochastic models of faulted and fractured reservoirs.

The Fraca-HM project deliverables are provided at the end of each year's program, at the annual meeting, and include, for each item developed during the program:

- presentation of research methodology;
- software prototype modules;
- training on the software prototype modules;
- presentation of the validation studies performed on synthetic and/or real field case studies provided by Fraca-HM partners;

- reports on methodology, user manual and tutorial for software prototype modules, validation studies.

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