Integrated Fracture Reservoir characterization and Modelling Course

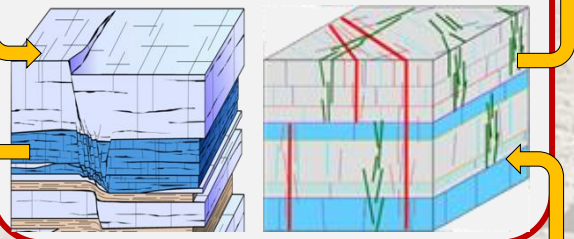
Geological understanding

Fracture modelling

Input data
Core, Borehole image interpretation, Seismic interpretation Dynamic data Static model etc . . .

Fracture understanding and characterization
Data integration, analysis and visualisation

Conceptual diagrams



Fracture modelling"

Dynamic simulation

Modified from Richard et al, 2022

Day 1 **Key foundation as data are for a study ☺**
- ✓ Fracture observations and description.
- ✓ How do rock deform? Rock mechanics – Mohr circles.
- ✓ Mechanical stratigraphy.
- ✓ Fracture nomenclatures.

Day 2 **How do fractures and faults form?**
- ✓ Understanding fracture development.
- ✓ Fracture chronology, Fracture corridors.
- ✓ Understanding fault growth.
- ✓ Fault geometry, fault segmentation, Fault damage zones.

Day 3 **Developing a structural evolution model as fracture model foundation**
- ✓ Structural styles, fault kinematics, stress orientation.
- ✓ Horizon curvature analysis.
- ✓ Linking local observations to regional knowledge.

Day3/4 **Fracture characterisation – Developing conceptual fracture concepts**
- ✓ Integration of static and dynamic data at all scales.
- ✓ Pressure transient analysis.
- ✓ Fracture porosity, Fracture permeability, Sampling bias.
- ✓ Extrapolating fracture model/concept away from well data.
- ✓ Use of subsurface and outcrop analogues
- ✓ Use of seismic attribute
- ✓ Capturing ranges of uncertainty in a series of conceptual diagrams.

Day 5 **Fracture modelling – fracture model upscaling.**
- ✓ Creating fracture models including learning's from days 1 to 4
- ✓ Integration of all data (e.g. well, outcrop and field scales, static, dynamic . . .)
- ✓ Developing a fracture modelling strategy and fracture model upscaling strategy
- ✓ Calibration of the models using dynamic data
  - ➢ **Defining the appropriate model(s) to build.**

Based on short lectures,

plenty of exercises

and

Hopefully, lots of discussions

PR GEOLOGY

Shorter version of the course are possible. A virtual Reality field trip can also be added.

For more details, please contact pascal.richard@prgeology.com