SUBSURFACE ALLIANCE

DATA DRIVEN | SCIENCE BASED | FIT-FOR-PURPOSE

We are a network of subsurface specialists using a Team-of-Teams approach to efficiently solve problems that have a direct business impact in today's fast-paced and evolving energy industry.

GEOTHERMAL SOLUTIONS

We offer comprehensive subsurface services to characterize, appraise and develop geothermal resources.

We use state-of-the-art geoscience and engineering tools and unique workflows specifically adapted to geothermal reservoirs.

Our team evaluates each project from a multidisciplinary perspective to identify key subsurface risks and help design data collection programs to mitigate them.

We integrate observations from core all the way through seismic to maximize value of information and reduce uncertainty.

We strive to provide high quality subsurface solutions for the energy industry by bridging the gap between geoscience and engineering

GEOSCIENCE

Integrated multiscale characterization and modeling of geothermal reservoirs. Distribution, intensity, connectivity of natural fractures and effective flow properties

GEOMECHANICS

Physics-based modeling of subsurface in-situ stresses and mechanical properties to assess thermal effects on wellbore stability for a safe and cost-efficient drilling.

RESERVOIR SIMULATION

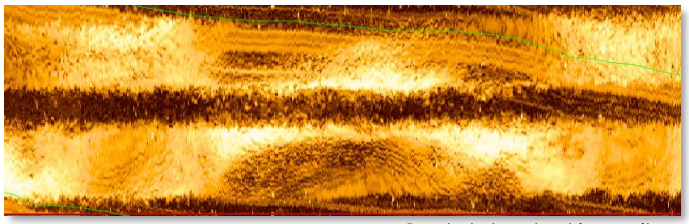
Implementation of coupled geomechanical models to optimize development plans and assess potential impact of thermal effects on fracture permeability in stress-sensitive reservoirs.

TECHNICAL SERVICES

Geothermal developments, where fluids are injected and then produced, induce temperature and pressure changes that modify the in-situ stress field. Permeability and connectivity across the hot formation, and how they might change under an evolving stress field, is key for the economic success of a project.

IN-SITU STRESS

Understanding and constraining the in-situ stress magnitudes and orientations in geothermal fields is of paramount importance for successful and safe drilling operations in hostile high-temperature environments.



Borehole breakout in granite

Partly open natural fracture in core

NATURAL FRACTURES

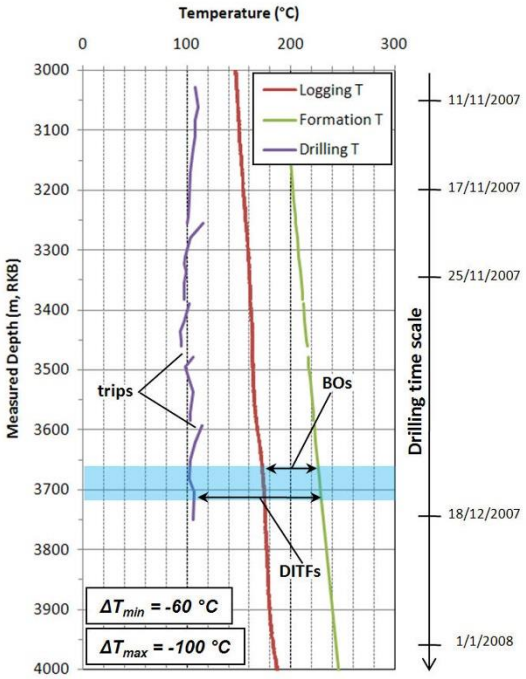
The ability of achieving high injection rates and efficiently circulate fluids between injector and producer often depends on the presence of natural fractures. Characterizing the natural fracture network and its connectivity helps to optimize field development.

THERMAL STRESS

Additional stresses arising from the temperature contrast between a cold injected fluid and a hot formation can lead to underestimating the impact of in-situ stresses. Modeling induced thermal stresses can ensure safe drilling operations and predict the impact on stress-sensitive reservoir permeability.

SIMULATION

Coupling reservoir and geomechanical simulations can improve reservoir performance prediction while optimizing field development plans. It can also help predict and mitigate collateral effects as induced seismicity and surface heave.



Wellbore temperature measurements in a deep geothermal well (Fernandez-Ibanez et al., 2009) while drilling and logging, and comparison to formation temperature.

CONTACT US

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We offer a variety of **training opportunities** to help develop fracture characterization capabilities within your company. Please reach out today to learn more or set up an initial consultation.

SUBSURFACE ALLIANCE

www.subsurfacealliance.com