Find Faults, Fractures and Their Interrelationships

The fastest, most accurate, and most complete automated Fault and Fracture interpretation capability is now available in a single offering – **FaultFractureSpark**. This **InsightEarth**® module pulls together the technology that was previously available separately into a single package, with workflows that solve needs for all types of faulting. Extract fractured regions with simplicity and compare them with through-going faults for the best geological understanding of the subsurface possible.

The choice to extract faults or fractures remains where it has always been – in the interpreter's hands. New workflows have been added to speed the understanding, insuring the best results possible in the shortest amount of time.

FaultFractureSpark for Faults

Stop clicking. Start defining.

FaultFractureSpark is by definition a fault-defining dynamo. It empowers interpretation by automating the fault extraction process, replacing ceaseless mind-numbing mouse clicks with speedy workflows and precise results.

This valuable solution creates complete distinct fault planes quickly, and illuminates the overall architecture of the fault system. With FaultFractureSpark, cleaner fault planes, trustworthy interpretations and superior fault definition comes automatically. No other interpretation system even comes close.

Industry Challenge

Interpreting faults is difficult and tedious, especially in complex, highly faulted formations. Inaccurate and incomplete interpretations often lead to missed pay, inefficient field development, miscorrelations, drilling hazards – and ultimately dry holes.

FaultFractureSpark in Action

FaultFractureSpark is powered by exclusive patented Automated Fault Extraction technology. This allows fault extraction and interpretation at unprecedented speeds and interpretation of the sharpest and most accurate fault plane geometries. This provides

valuable time to think about the prospect by replacing the labor-intensive task of manual fault picking found in legacy software.

FaultFractureSpark drives fast and productive workflows both at the beginning of the 3D interpretation cycle and interactively throughout the process. Using a discontinuity volume as a starting point, the workflow runs on the entire volume, or interactively on selected sub-volumes. Plus, the technology improves the results of automatic horizon tracking and geobody segmentation algorithms by eliminating miscorrelation across faults, as the results produced in this solution can be utilized at no additional effort in other modules of InsightEarth.

FaultFractureSpark Advantage

- Consistentdetailedfaultimagingacrossawide range of geologic environments, in both time and depth volumes, regardless of seismic data quality

- Completefaultinterpretationfunctionality, from traditional picking to fully automatic fault extraction

- Countlesstediousmouseclicksrequiredinother packages are replaced with single-pass accuracy to guide smarter drilling decisions

- AutomatedFaultExtractioncombinedwithother technologies reveal areas of true enhanced fracture density

- Attributepropertycalculatorinterpretsinjection and production trends more accurately

- SpecialBrittleandDuctilefaciesworkflowis included at no extra charge

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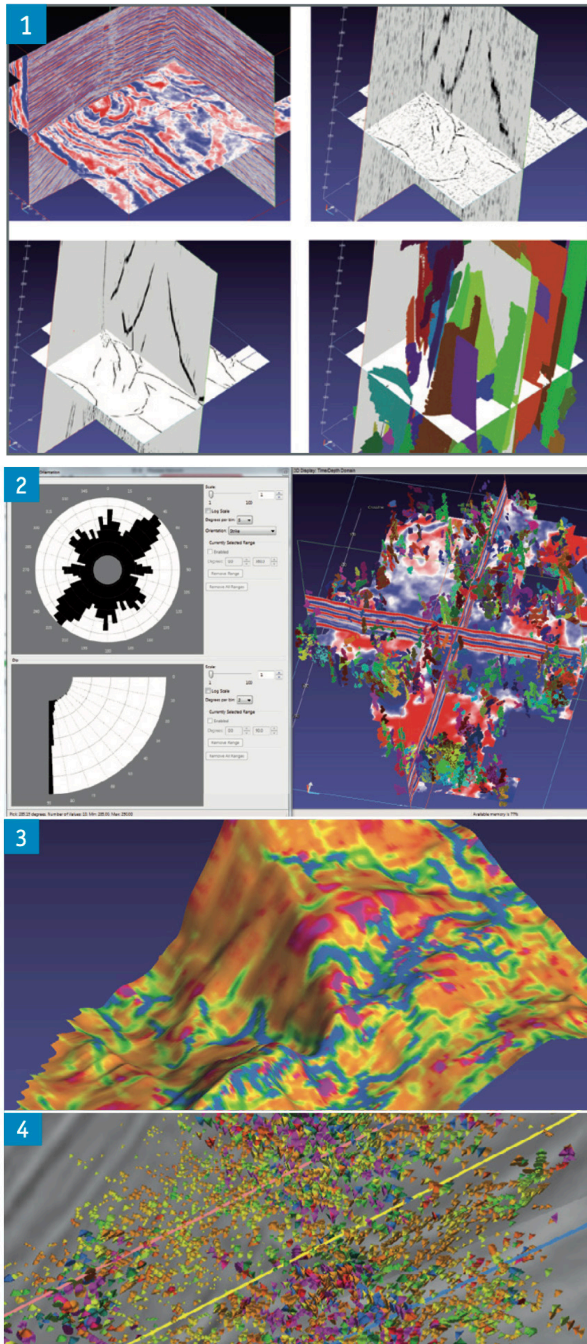
Figure 1. Progression from seismic amplitude volume and the discontinuity attribute to the Advanced Fault Enhanced volume and the final extracted fault surfaces.

Figure 2. The Rose Diagram refines the Automated Fracture Extraction results, and controls the display of fracture planes by strike and dip control ranges. This is particularly useful when there are hundreds to thousands of fractures present in a survey.

Figure 3 Most Negative Curvature attribute as displayed on an interpreted horizon.

Figure 4 Microseismic events displayed in seismic data along their horizontal well bores.

FaultFractureSpark for Faults

Define fractures. Determine the sweet spot. Drill with confidence.

FaultFractureSpark turns data into drilling plans. It reveals the discrete fracture network in unconventional plays, making it easy to plan the ideal path for directional drilling.

This advanced solution identifies areas of enhanced fracture density. It finds the sweet spot for tapping the formation for optimal drainage and identifies target intervals for zonal completions.

With **FaultFractureSpark**, feeling around in the dark to find the fractures and brittle zones becomes a thing of the past.

Industry Challenge

Designing an optimal well path in an unconventional formation can be a blind endeavor. It is nearly impossible to locate areas of sub-seismic fracture density and to see facies changes within the fractured reservoir. Without this vital insight, production is compromised.

FaultFractureSpark Solution

FaultFractureSpark provides the necessary vision required to optimize the well path and maximize production. Visualize microseismic data together with seismic and well data to rapidly identify areas of enhanced fracture density and radically reduce the drilling risk. Data links allow easy access to reservoir characterization attributes to provide further refinement of the reservoir sweet spots.

FaultFractureSpark in Action

Once the fractured regions have been identified, they can be compared with Microseismic using full 3D visualization, including glyphs and transparency. The time-lapse display of the Microseismic events can be synchronized with the pressure, flow and proppant concentration parameters of the frac job.

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