

# OUR REFERENCES



## More than 30 years of experience in the fields of ...

Groundwater and geothermal studies in the Styrian Basin, in the Alpine Basins and the Molasse

Geophysical Studies for Nuclear Waste Deposit in Switzerland

Geothermal studies in the Vienna Basin

Groundwater and geothermal studies in the Upper Rhine Graben

Reservoir studies in the Sirte Basin (Libya)

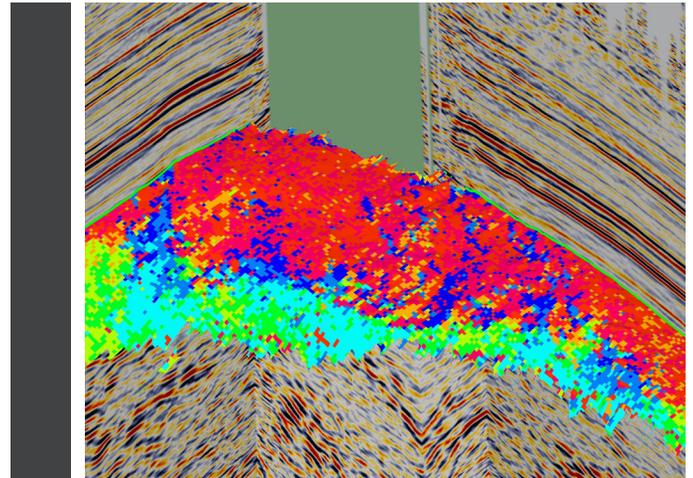
Reservoir studies in the Murzuq Basin (Libya)

Reservoir studies in the Pannonian Basin (Hungary and Romania)

Software Development  
FracTex plug-in for OpendTect

Directional textural attribute  
plug-in for OpendTect

Engineering Geophysics  
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**FracTex**  
VISUALIZE YOUR FRACTURES

Our partners:

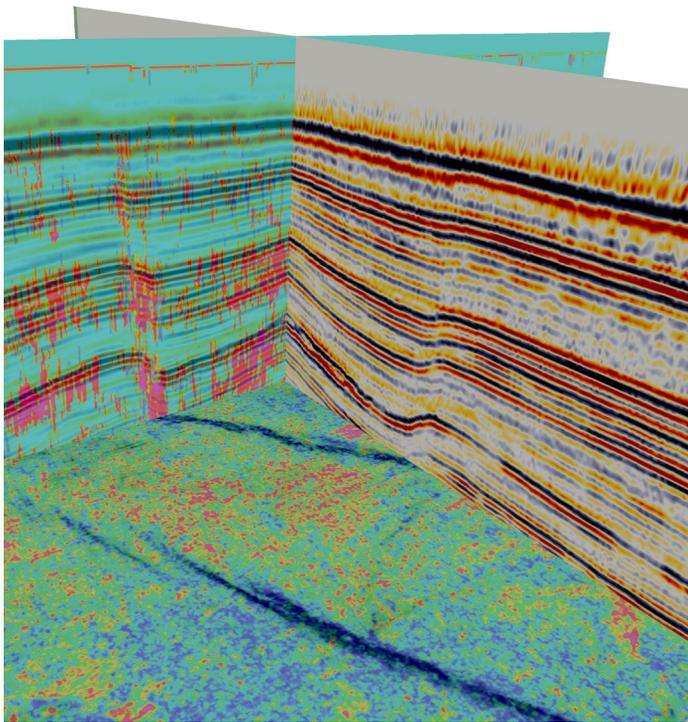


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IN-DEPTH EXPERTISE

# FracTex

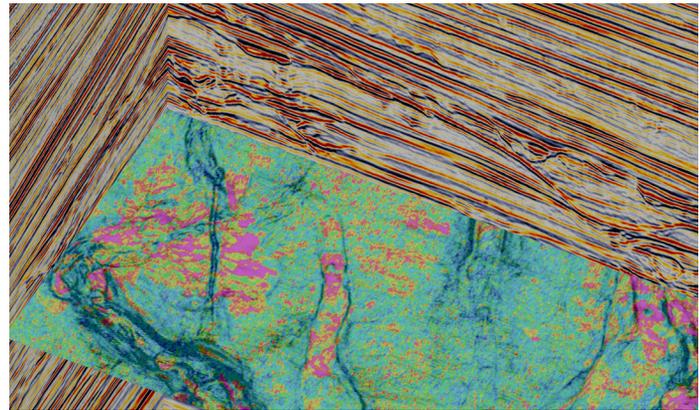
Anisotropy refers to directional properties. In geophysics, we often refer to seismic anisotropy, the dependence of velocity on direction or upon angle. Variation in seismic velocity with direction may reflect lateral changes in facies, the presence of faults or fractures, or differences in pore fillings, among many factors that may influence velocity. In principal, seismic data can be used to estimate volumetric azimuthal anisotropy. The grey level co-occurrence matrix (GLCM), initially described as a tool for image classification, is a measure of how often different combinations of pixel brightness values occur in an image. GLCM-based attributes can be calculated in different directions, yielding an array of radial responses.



FracTex plugin computes GLCM-based attributes in different directions and compares these results. Based on that comparison a factor for seismic anisotropy is computed and the azimuth of the direction with most variability in seismic character is determined. This information can then be correlated with seismic facies changes or fracturing.

The default output type is the anisotropy factor, which gives in principal the relationship of the highest and lowest GLCM based attribute responses for each sample point. This anisotropy factor can be linked with fracture intensity in a fractured reservoir. For a homogeneous formation, the theoretical value for the anisotropy factor would be 1. Higher values indicate higher anisotropy.

The azimuth of fracture dip indicates the azimuth in which the highest variability in data occurs. For a fractured reservoir this would correspond with the azimuth of fracture dip. To avoid over-estimation of fractures it is advisable to apply a threshold value for the azimuth of fracture dip calculation. In this case a simultaneous calculation of anisotropy factor and azimuth of fracture dip is done, and for sample points where the anisotropy factor is below this threshold value, the azimuth of fracture dip is set to undefined.



## FracTex features

**The FracTex plug-in offers the following features:**

- Seismic anisotropy calculation
- Determination of direction with variability in seismic character

**In combination with other seismic attributes and log data this plug-in can be used for:**

- Fracture intensity description
- Azimuth of fracture dip
- Seismic facies description
- Fault zone description