



Microseismics for Petroleum

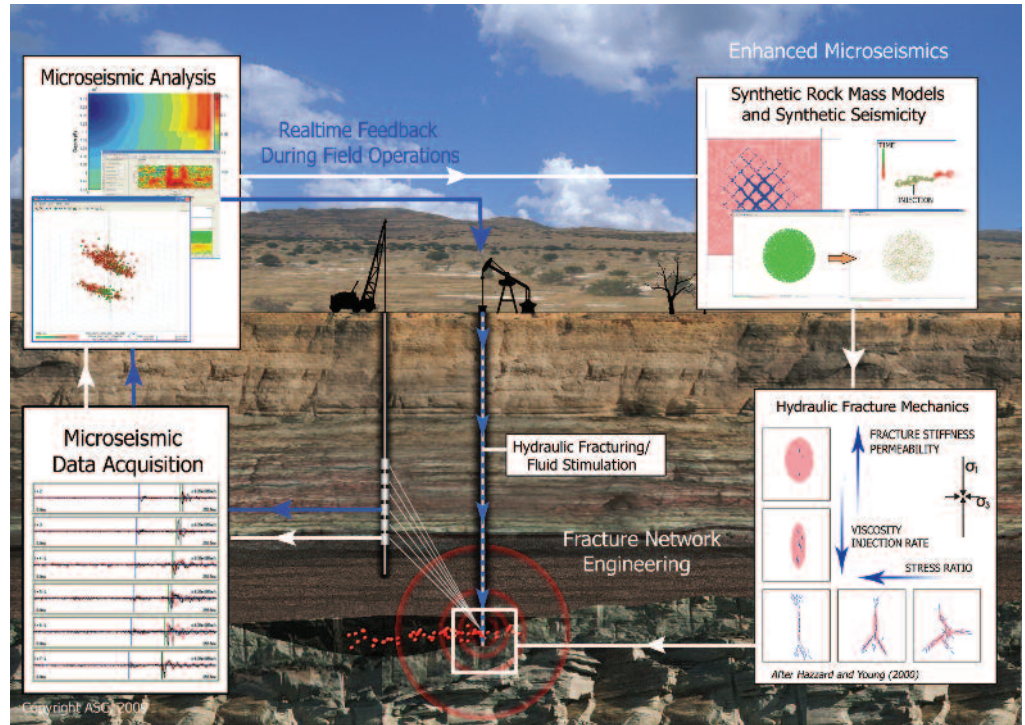
Passive Imaging of Reservoir Development

Applying Seismology to the Engineered Environment

Microseismics for Petroleum

Microseismic monitoring, also known as “passive seismic”, allows engineers to visualise active fracture networks within developing or producing fields.

- Real-time optimisation of hydrofracture stimulations.
- Post-analysis of completion objectives and stimulation effectiveness with treated “hot zones”.
- Delineation of treatment breakthrough and communication with active fault structures.
- Mapping of extraction or injection paths through producing fields.
- Investigation of active fault zones, compaction and subsidence.

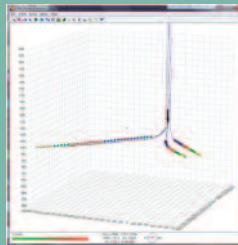
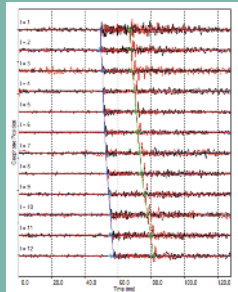


- Real-time processing of microseismic data can provide feedback of information to engineers on the position, growth and effectiveness of a hydrofracture stimulation, or can map extraction and injection paths in a producing field.
- Post-processing yields a greater understanding of the treatment history and fluid migration. Analysis of microseismic parameters and clustering yields treatment hot zones and provides for an assessment of the completion objectives.
- Advanced analysis of microseismic data yields information on fracture networks such as distribution, persistence and orientations, and can describe the mechanisms behind the fracture growth leading to a better understanding of the reservoir behaviour.
- ASC provides a fully integrated processing service from array design, through data management and processing to advanced interpretations with dynamic numerical models to better understand the growth and activation of the fracture structures.

Full range of services for the petroleum industry at:
www.appliedseismology.com/petroleum/

Services for the Petroleum Industry

ASC has pioneered the application of microseismic technologies to petroleum field development through its InSite Seismic Processor and Enhanced Microseismics Program.



We provide a broad spectrum of microseismic processing services, including: real-time data analysis; quality assurance of pre-processed data sets; full post-processing, and enhanced microseismic analysis.

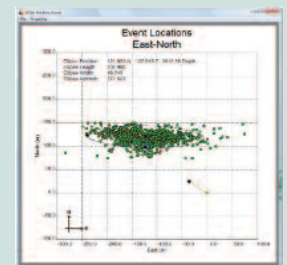
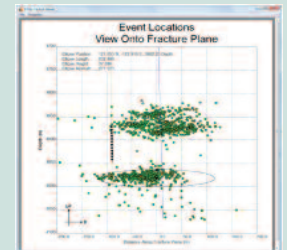
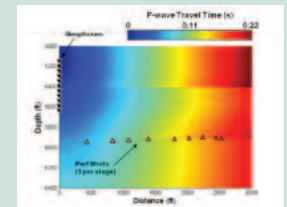
ASC provides the industry's leading hardware-independent microseismic software package, InSite, that includes standard tools as well as advanced analysis options for do-it-yourself processing.

Our full integrated microseismic processing service can provide array design, through real-time processing, results interpretation and correlation of the data with dynamic numerical models of the fracture network and mechanics.

Software and Data Acquisition

InSite is a software solution for hydrofracture and field monitoring providing a fully three-dimensional microseismic source analysis.

- Our software is fully automatic, can be run in real time and provides advanced data management, processing and visualisation features.
- The InSite software is independent of any hardware product or vendor. It can be interfaced to data streams from geophone strings to provide real-time data capture, or used off-line for advanced post-processing analysis.
- InSite's Frac Manager provides an integrated studio for management of microseismic data sets with advanced processing and visualisation techniques for hydrofracture data.
- We provide fully-featured microseismic training courses focussed on the principles behind the technology, processing algorithms and hands-on experience of using the software.



Microseismic software for the petroleum industry at:
www.appliedseismology.com/petroleum/software.aspx

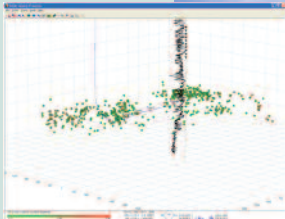
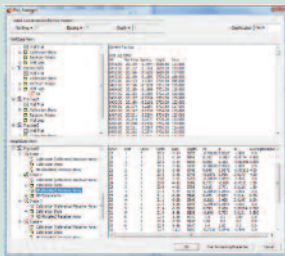
Experience and Innovation

ASC is at the leading edge of providing technologies for commercial microseismic applications.

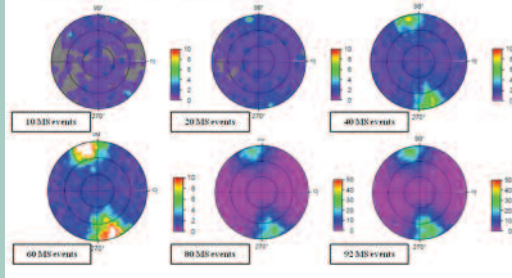
We continue to develop unique algorithms for managing and processing microseismic data from hydrofracture treatments and whole-field monitoring. Our software release and support system provides these latest technologies through our website client-login area.

Our InSiteDB database technologies are networking remote microseismic geophysicists and clients to real-time and post-processed data sets and results.

Our Enhanced Microseismics program provides an integrated interpretation of the rock's hydrodynamic response through correlation of fracture network structures with Synthetic Rock Mass (SRM) geomechanical models.



Evolution of fracture orientation:



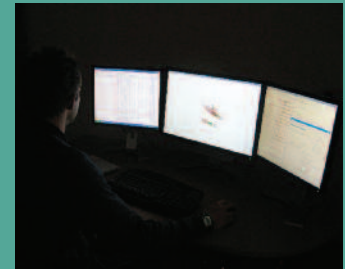
Applied Seismology Consultants

ASC specialises in providing commercial microseismic monitoring, processing and advanced analyses in a range of sectors including mining, radwaste storage, petroleum, geothermal, carbon sequestration, engineering, and laboratory testing. From May 2009 ASC is an Itasca International company.

Services are targeted at supplying an integrated work package along the full data path through sensor array design, data acquisition, processing and interpretation.

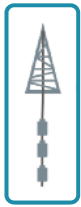
ASC's leading software, InSite, developed for over 10 years as a complete solution for ASC's consulting operations, is now used by many international organisations for in-house processing and management of seismic data.

ASC has a Quality Management System certified in accordance with the standard BS EN ISO 9001:2000.



Case Studies and Publications:

<http://www.appliedseismology.com/petroleum/pubs.aspx>



Geophone data streams from monitoring array



Acquisition PC



Processing PC-InSite

Leach interface and waveform processing



InSiteDB Remote Database



Microseismics Stakeholders

Data visualisation, further processing and data QA

Full range of services at:
www.appliedseismology.com

Applying Seismology to the Engineered Environment



We specialise in commercial application of microseismic technologies.

Broad spectrum of microseismic processing services.

Cutting-edge development of microseismic technologies along entire data path.

Leading independent microseismic processing software package InSite.

Standard and advanced software tools for do-it-yourself processing.

Software release and support system providing latest technology developments.

Fully-featured microseismic training courses.

Advanced database technologies for networking remote microseismic stakeholders.

Geophysics team for provision of complete processing service solution.

Microseismic project management, array design, data hosting and integrated processing systems.

Real-time capture of microseismic events from geophone string data streams.

Processing and feedback of real-time results.

Full post-processing options and Enhanced Microseismics program.

Quality assurance of third party microseismic processing results.



A range of projects and data sets are available to demonstrate the capabilities of InSite for applications across different industries.

Download the InSite demo at:
www.appliedseismology.com/demo.aspx



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