In different areas, seismic may show different type of amplitude anomalies. These anomalies are caused by local changes in rock properties. The investigation of what causes these anomalies is important because it can prove hydrocarbon source, reservoir presence, and trap. However, similar-looking anomalies can also be caused not only by the presence of hydrocarbon, but also by changes in lithology or thickness. We build Taylor-made QI workflows to solve specific problems. Our workflows may include:

- Well-log conditioning for rock physics analysis and seismic inversion
- Estimation of Shear wave velocity and density from P-wave velocity based on lithology and rock microstructures.
- Upscaling of well-log data to seismic data
- Depth trends analysis
- Seismic Rock Physics to parameterize acoustic and simultaneous elastic inversion
- Extended Elastic Impedance analysis
- Wedge modeling using horizontal and slanted layers
- Full waveform synthetic seismograms for isotropic and anisotropic media
- AVO analysis for probable geologic scenarios in the well and away from the well

**Rock Physics Modeling Prediction away from wells**

- What reservoir properties can be discovered using measured seismic amplitudes?
- How can we estimate rock properties from seismic amplitudes and travel times?

The following is a list of possible geological features that affect rock elastic properties significantly.

- Fractures
- Mineralogy and TOC
- Porosity
- Rock Microstructure
- Textural features: Sorting, cementation, grain, and pore size and shape
- Fluid type
- Fluid volumes
- Fluid distribution in pore space
- Fluid properties
- Salinity
- Brittleness
- Stresses
- Pore Pressure
- Temperature

**Seismic Rock Physics, LLC.**

**COURSES**

These courses are uniquely designed comprehensive state-of-the-art instructions in rock physics and seismic petrophysics. These courses will equip you with the necessary tools to start applying rock physics. They are intended for Geologists, Geophysicists, Petrophysicists, and Engineers to provide grounding in understanding relationships between geophysical measurements and rock properties, with emphasis on the integrated interpretation of seismic, well logs, and laboratory data. They are not exclusively a theoretical courses, but orientation on the necessary theories will be provided.

- Rock Physics Fundamentals
- Fluid Substitution
- Seismic Petrophysics
- Static/Dynamic Mechanical Properties
- Pore Pressure and Fracture Gradient
Seismic Derived Mechanical Properties for Geomechanic Studies

Laboratory Data
Dynamic and static Young’s moduli, Poisson’s ratio, and mechanical properties at in situ fluids, pore pressure, stresses, and temperature.

Well Data
Well-log derived Dynamic and static Young’s modulus and Poisson’s ratio, and strength at well-log scale, using lab correlations. Stresses and Pressure estimated as a function of depth.

Simultaneous Elastic Inversion
Seismic derived dynamic and static Young’s modulus, Poisson’s ratio, and strength at seismic scale, calibrated with well-logs and using laboratory correlations.

3D-models of mechanical Properties
3D models of mechanical properties derived from seismic. Extracted mini-cubes can be used for, e.g. hydraulic fracturing.

Seismic Rock Physics, LLC.
CONSULTING
We offer consultancy services in rock physics. A seismic rock physics study includes different tasks depending on the goal of the project. Usually, it comprises the integration of laboratory-, well-, and seismic-data. The purpose of seismic rock physics is to better understand, in terms of rock properties, the seismic response of target reservoirs and of the overlying and underlying formations. Based on a rock physics feasibility study, in one or several wells, we should be able to define which seismic attribute or inversion method are optimal for: the characterization of target formations and the overlying and underlying formations. The rock physics feasibility study also allows to select better parameters for gather conditioning, seismic inversion, and find better ways to transfer well information to seismic.

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Seismic Rock Physics, LLC.
Research, Consulting, and Courses
SERVICES
Seismic Rock Physics LLC is an oil-service company based in Texas, USA. Rock Physics helps E&P companies to de-risk prospects and analyze uncertainties in resource estimation during seismic interpretation. The understanding of the relationships between rock properties and seismic signature help to define if the discrimination of reservoir properties can be achieved using only amplitude with offset analysis or also a specific kind of seismic inversion technique.

- Seismic Rock Physics
- Regional Rock Physics Studies
- 1D-3D Static Mechanical Properties
- Rock Physics Based Seismic Quantitative Interpretation Products
- Pore Pressure and Fracture Gradient Studies
- Time and Depth Seismic Processing
- Seismic Survey Design and QC
- Rock Physics Courses
- Research in Rock Physics
- Consulting