absolute IMAGING

Depth Imaging

global expertise and personalized service

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Absolute Imaging has extensive expertise to provide 2D and 3D Depth Imaging in onshore and offshore environments. Absolute Imaging's Depth expertise includes ray and wave equation-based migrators, isotropic and anisotropic analysis, and model building for accurate simulation of wave propagation in complex subsurface areas. Model refinement includes methods of travel time error estimation, constrained velocity inversion, and grid and/or horizon-based tomography. Well information can also be used in the initial model creation or for model-updating workflows. A variety of analysis tools provide for model validation and seismic/ray/model overlay visualization. Depth Imaging helps reduce drilling risk in subsurface geological structures like thrust faults, fault shadows, reefs, subsalt, sub-basalt, salt flanks, gas plumes, and those with subtle lateral velocity variations. Our Advanced Imaging group has experience working in some of the most complex geological environments from around the world.
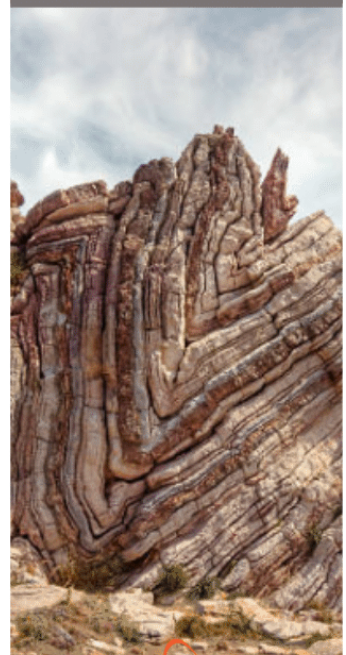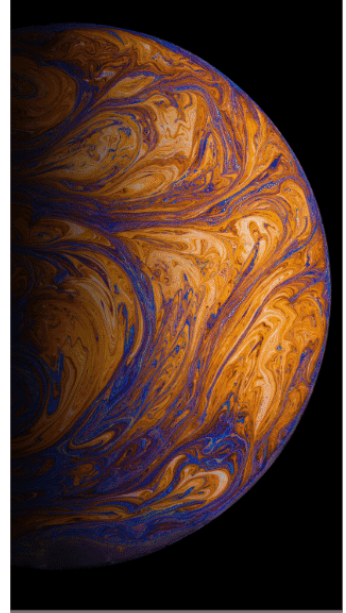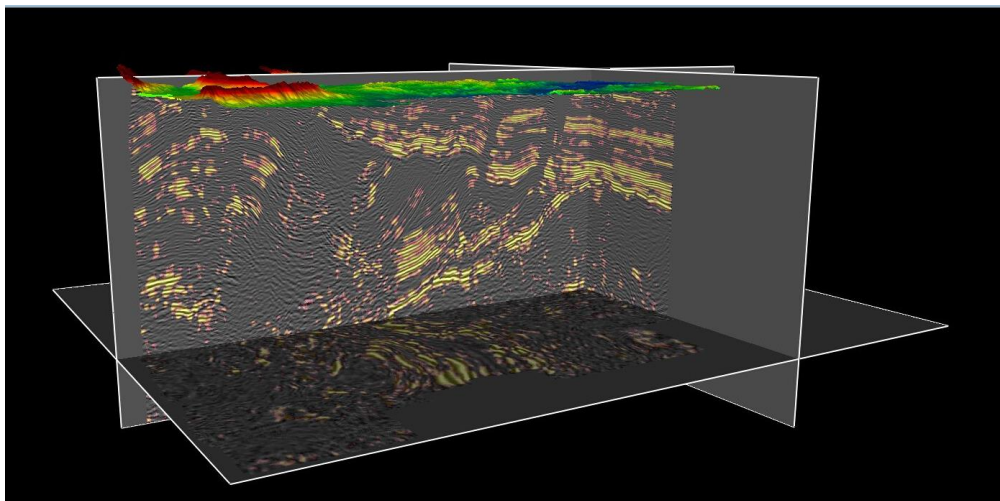
Initial Model Building

The initial velocity model is constructed via Geostatistical Volume Creation (GVC), using available velocity information from the time processing (PSTM velocity), well measurements, interpretation, near surface modeling, and geostatistics.

RMO Estimation

At Absolute Imaging a variety of RMO estimation methods are available. Depending upon the data complexity and S/N ratio, the following strategies can be implemented to improve the quality of the residual move-out values:
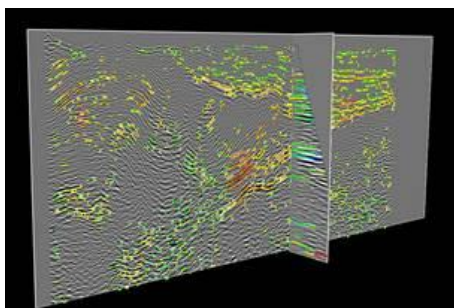
- High Resolution Automatic residual move-out using FastVel

- Layer or Horizon based automatic RMO using Velocity Navigator

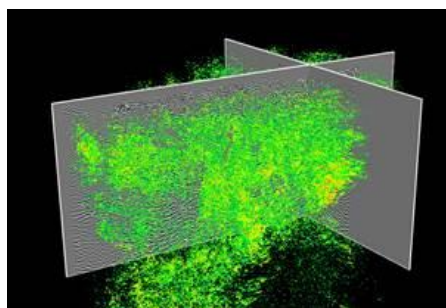- Layer or Horizon based manual RMO picking using Velocity Navigator
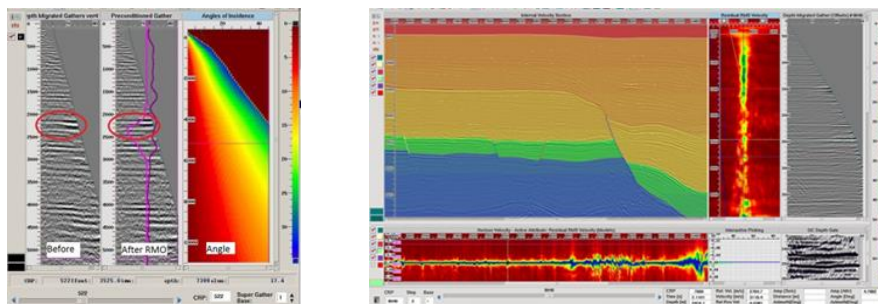
FastVel and Velocity Navigator for RMO Analysis

RMO QC and Editing

- Control over input to Tomography by editing points of noisy unreliable data

- Global visualisation of RMO autopicker results



Stack and CDP Gather with RMO in 3D space (Left)

Residual Moveout (RMO) QC in 3D space (Right)

Velocity Refinement using High Resolution Tomography

Based on the geological complexity and goals of the project, the following strategies can be used in order to update Vp, Vs, Epsilon, Delta, Dip, and Azimuth (TTI). Methodologies can be combined together in order to achieve the highest quality & faster convergence.
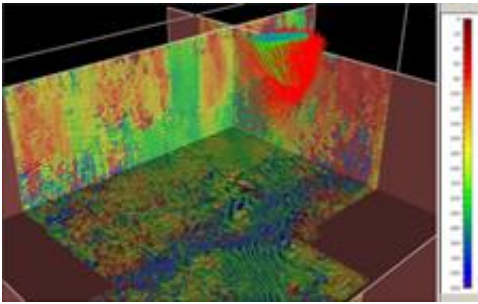
Seismic overlaid with Azimuth
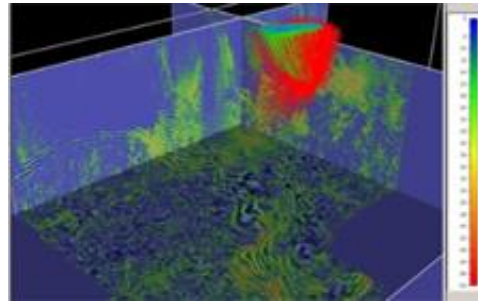
Seismic overlaid with Continuity

Grid Based Tomography

- Updates velocity volumes (Vpz, Vsz), as well as Epsilon and Delta, simultaneously on a regular grid

Joint Reflection-Refraction Tomography

- Joint Reflection-Refraction (JRR) is a data mode within the 3D Grid Tomography application, and is a combination of the reflection mode and the refraction mode.

Layer Based Tomography

- Geologically constrained solutions
- Updates velocity volumes (Vpz, Vsz), as well as Epsilon and Delta, simultaneously along the depth model horizons

Well Tie Tomography

- Well or horizon mistie maps are used as constraints to update velocity volumes (Vpz, Vsz) as well as Epsilon and Delta
- Preserves gather flatness

Pre-stack Depth Migration—PSDM

A key component of successful Depth Imaging is the selection of appropriate migrators. Absolute

Imaging has a variety of migration algorithms appropriate for differing geological settings:

- Full TTI Kirchhoff Migration

- Full TTI Common Reflection Angle Migration (CRAM) - Advanced Beam Migration

- Full TTI Wave Equation Migration (WEM)

- Full TTI RTM Reverse Time Migration (RTM)
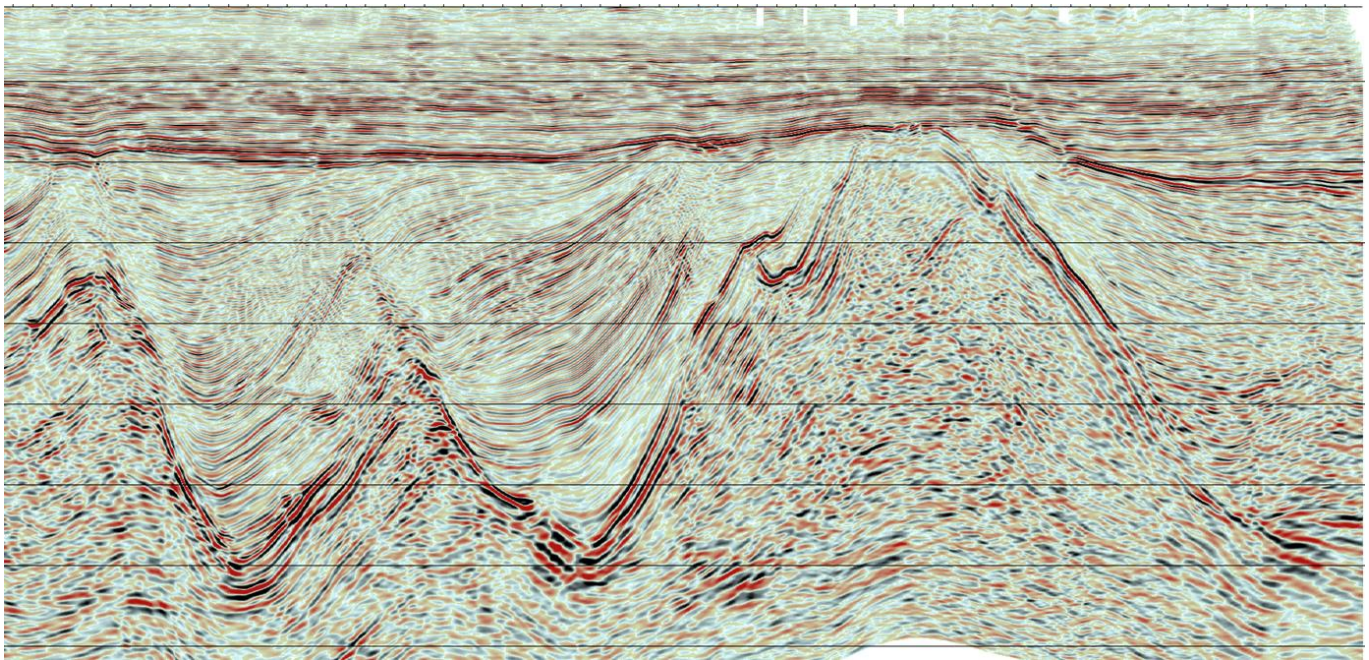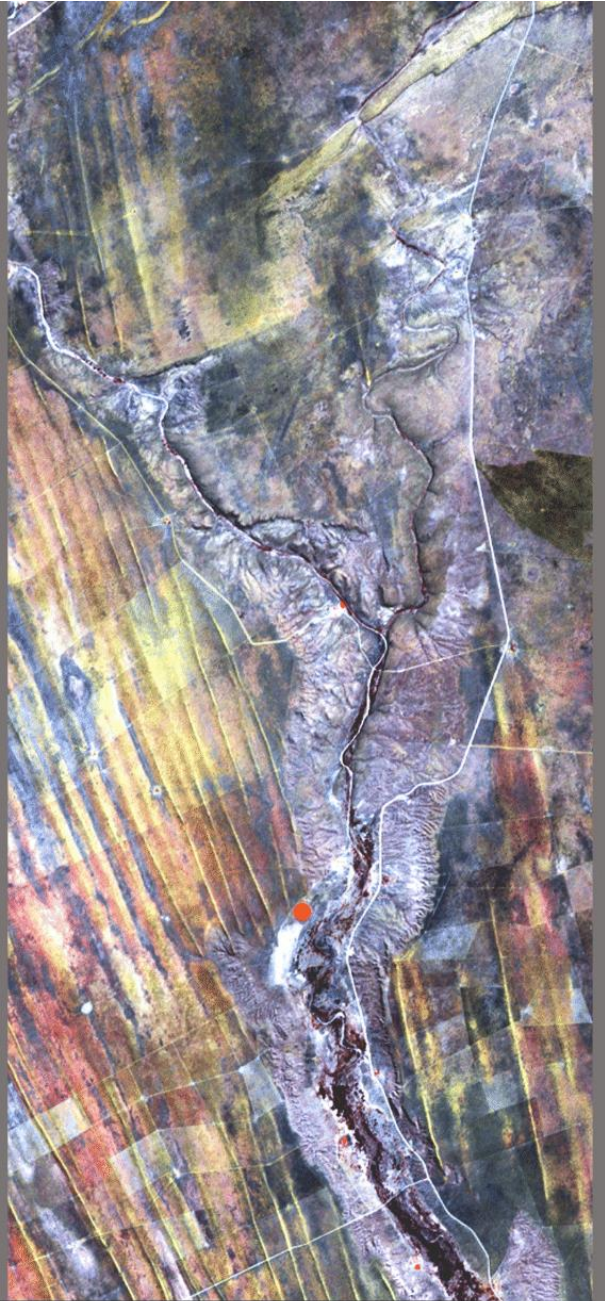
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