Pre-Stack Pro is the first “Big Data” software for processing and interpreting 3D seismic gather datasets. Use the new Azimuthal module to process, analyse, and interpret 100% of the gather data you collect from wide and full-azimuth surveys. Get your data out of the archive and on to your desk.

- **Input to Fracture and Stress Prediction**
- **Improved Imaging in Complex Structures**
- **Powerful and Easy to Use**
Smart Software for a Full Azimuthal Workflow

LOAD | VIEW | CLEAN | SECTOR | STACK | ANALYSE

**Feature Highlights**

- Load HUGE volumes (TBs) of 5D data and retain gathers throughout the analysis.
- View multi-dimensional gathers anywhere with a single mouse click, for easy interactive data review.
- Stack data interactively - any azimuth, any incident angle.
- Condition 5D gathers in Cartesian or polar domains – and retain full resolution for azimuthal analysis.
- Track horizons in 5D – for fast and accurate analysis of anisotropy on specific events.
- Estimate velocity and amplitude anisotropy on horizons or full volumes

**Flexible, Interactive Workflows**

- Use all available data
- Flexible options to suit your problem
- Modify conditioning parameters and quickly update all analytical results
- Drill down to the source data to increase confidence in the results

**Pre-Stack Pro gives you time to do more**

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*p*Common-Offset, Common-Azimuth (COCA), Common Offset Vectors (COV)*
**Common-Offset, Common-Azimuth (COCA) Sectoring**

- Create sectored gathers on-the-fly, with full control over density of azimuth and offset bins.
- Optional 5D trace interpolation can be switched on and off to fill all sector bins and give a more complete understanding.
- Intuitive data density plots to guide choice of parameters and show population of COV traces for any sector selection.

**Multi Dimensional Gather Views**

- Display options include COCA or CICA gathers showing all traces sorted by offset, incidence angle, or azimuth.
- Select locations from any stack or map location, and display cartesian or sectored gathers along inlines, crosslines, or arbitrary paths.

- Easily display any COV or COCA volume in stack or gather viewers.
- Display all azimuths, offsets, or angles for a single CDP location in a single plot.
Gather Conditioning

- All gather conditioning algorithms have been extended for COCA gathers, to reduce noise, sharpen images, and improve quantitative interpretation results.
- Many processing routines, including gather flattening, can also be applied directly to COV gathers. This ensures accurate 5D interpolation when sectoring.
- Improvements to the longer offset data will carry into the azimuthal analysis and increase confidence in the amplitude-versus-azimuth and velocity-versus-azimuth results.

COCA - NO Conditioning

COCA - Pre-Sected Conditioning

Azimuthal Velocity Estimation

- The RMO (residual moveout) analysis tool now automatically loops over all azimuths and outputs a velocity ellipse containing $V_{fast}$, $V_{slow}$, and direction of $V_{fast}$.
- Results can be fed directly to the velocity-versus-azimuth (VVAZ) analysis modules.
**Interactive Stacking**

- Interactively stack COV/COCA/CICA Gathers by selecting any set of gather traces.
- Default is equal weighting of all stacked traces.
- Customize weighted stacks, and compare to weighting factors applied by seismic contractors.

**5D Horizon Tracking**

- Autotrack 3D horizons on any partial stack, and quickly extend picks to the 5D gathers.
- Use the results to characterize travel time and amplitude variations with offset, angle, and azimuth.
- Display any choice of offset, angle, and azimuth in the map viewers.
ANISOTROPY & 3D FRACTURE ANALYSIS

Formations with natural fractures often exhibit both amplitude (AVAZ) and velocity (VVAZ) anisotropy. New analysis modules calculate these properties directly from the 5D gathers.

Typical workflow

- Gather conditioning, including event flattening
- Map offsets (COCA) to angles (CICA) using “isotropic” velocity
- Extract 5D amplitudes and fit using AVAZ model
- Map directions and magnitudes of amplitude anisotropy
- QC and assess confidence with misfit analysis

Amplitude vs Azimuth (AVAZ)

- Extract amplitudes at all angles and azimuths,
- Compute azimuthally-dependent and azimuthally-averaged AVO attributes,
- Display maps of intercept, averaged gradient, azimuth gradient, and anisotropic direction,
- Interrogate and assess confidence with misfit analysis.

Velocity vs Azimuth (VVAZ)

- Determine azimuthal RMS velocity ellipse parameters from horizon travel times or azimuthal RMO,
- Invert to Vint between two layers using anisotropic Dix method,
- Results reported as Vfast and Vfast direction
- Display maps showing magnitude and direction of Vfast and Vslow.

The Azimuthal module is available now as an add-on option in Pre-Stack Pro
Contact sales (sales@sharpreflections.com) for licensing details.
We kindly thank Dr Heloise Lynn from Lynn Inc. for providing the 5D seismic data and advice.