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Z-Terra launches 3D Kirchhoff depth & time migration

HOUSTON, Texas – Z-Terra Inc., a provider of depth imaging software and services for oil and gas exploration, has launched ZTK version 2.0, the company's breakthrough implementation of the three-dimensional Kirchhoff depth and time migration for seismic imaging.

ZTK images seismic data by solving the wave equation with a boundary integral method. The acoustic reflectivity at every point of the Earth's interior is computed by summing the recorded data on multidimensional surfaces; the shape of the summation surfaces and the summation weights are computed from the Green's functions of the single scattering wave propagation experiment.

“We want to have the best Kirchhoff Prestack Time and Depth Migration product in the industry in terms of features, speed and accuracy of results. And the price is very reasonable. Our Kirchhoff scales up to tens of thousands of CPUs and is very stable. It can generate migrated stacked volumes, grid targets with offset gathers, offset gathers on a sparse grid or on a completely populated image grid” said Dr. Alexander Mihai Popovici, Chairman and CEO. “The input data requirements for this application are fully preprocessed time traces in any order and a velocity model. The bottom line is enhanced accuracy and greater speed of processing the data.”

Some Kirchhoff migration features included in this release:

- Data Geometry, image geometry, travel-time geometry, velocity model geometry.
- SEG Y Viewer for QC input data, header and trace investigation.
- Data Viewer for 2D/3D velocity, travel-times, image.
- Base Map Viewer for data and grid definition.
- Travel-times generation: Huygens Wavefront Construction most Energetic Arrivals.
- Input data indexing.
- Output: Offset Gathers.
- Anti-aliasing: triangles.
- Amplitude corrections.



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- Aperture design, depth varying aperture.
- Variable step with depth.
- Data pre-processing, t_{pow} – spherical divergence correction.
- Topography.
- Variable image output.
- Job monitoring, add nodes, subtract nodes, job stop/restart checkpoint.
- PSDM and PSTM.
- Travel-times generation.
 - Huygens Wavefront Travel-times.
 - Eikonal Finite Difference Solution.
- Traveltimes QC tools, rays, wave-fronts.
- PSTM with straight rays and curved rays.
- Input data indexing.
- Anti-aliasing: triangles, boxcar, m-bandpass.
- Amplitude corrections.
- Aperture design.
- Variable step with depth.
- Data pre-processing.
- Topography.
- Offset compensation, fold balance weighting.
- Histogram representation for offset and azimuth distribution.
- Add and subtract nodes during runtime.
- Job monitoring.
- Image mask.
- Grid of targets, sparse target lines.
- Travel-times dynamic grid.
- Anisotropic Curved Rays for PSTM.
- Anisotropic VTI travel-times for PSDM.
- Anisotropic TTI travel-times for PSDM.
- Offset compensation, weighting.
- Converted waves, OBC.
- Adaptive run-time configuration.
- Optimization of data distribution.



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- VSP geometry.
- Targets, grid of targets, sparse target lines.
- Output Wide and Narrow Azimuth Gathers.
- Gamma migration scans.
- Diffraction Imaging.

Z-Terra is a provider of software solutions for the upstream oil and gas industry. The company has developed a suite of interactive depth imaging and velocity model-building software products designed to be the fastest and most accurate depth imaging solutions in the industry.

Popovici is the founder and former CEO of 3DGeo Inc. The company was sold in 2008. 3DGeo grew from two employees in Palo Alto, California, to an international corporation with offices in Houston, California, Buenos Aires and Rio de Janeiro, with representation in Beijing and The Hague. In 2001, 3DGeo was recognized as one of the Top 100 Innovative Companies by InfoWorld. The company won the Hart E&P Meritorious Award for Engineering Innovation in 2007 and the IEEE Spectrum Technology award in 2008.

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