RTM 3D Gathers

Bringing the clarity of RTM to prestack data

CGGVeritas continues to pioneer Reverse Time Migration (RTM) technologies for superior imaging in areas of complex structure. The clarity of TTI RTM is now available prestack, on 3D angle-domain common-image gathers (ADCIGs) that retain the rich azimuth and reflection angle information inherent in wide-azimuth (WAZ) data, while honoring anisotropy.

A significant industry-first for CGGVeritas allows us to harness the accuracy of RTM for tomography, velocity modeling, anisotropy inversion and true-amplitude reservoir attribute analysis. It also helps evaluate subsurface illumination and stack optimization for wide-azimuth data.

RTM gathers are equally applicable to land and marine. They can improve azimuthal AVA analysis, often applied for onshore fractured reservoirs. Complex thrust belt and foothills data share in these benefits. RTM gathers can also be generated for ocean-bottom and VSP scenarios.

RTM gathers are free of migration artefacts typical of ray-based algorithms, due to multi-pathing issues in the vicinity of complex structures. Using RTM for the entire model building process results in a more accurate velocity model and hence better final images. It signals the end of the inconsistent methodology of using ray (or beam) methods for model building and RTM for the migration stage only.

FEATURES:
• Implemented for VTI/TTI anisotropy
• Suitable for streamer, ocean bottom, land and VSP acquisition geometries
• Ideal for azimuthal AVA and anisotropic analysis

BENEFITS:
• Preserve full-azimuth information
• Improved tomography resolution for wide-azimuth data
• Absolute best quality throughout the modeling and imaging process

VTI RTM data from CGGVeritas Garden Banks WAZ data. Stack data (left) with yellow line annotating the location of an RTM 3D gather (right), displayed in six azimuthal sectors.

Safer, Clearer, Better
IMPROVED TOMOGRAPHY

Preserving the full-azimuth information in RTM 3D gathers allows subsalt tomography to properly distribute velocity updates, resulting in:

• Stable solutions
• Improved resolution
• Accurate velocity models
• Clearer images

Until now, angle-domain common-image gathers (ADCIGs) have been calculated based on a 2D approach. In practice, 2D ADCIGs include reflection angles only along the inline direction, which is neither correct for complex geology such as subsalt nor suitable for wide-azimuth (WAZ) data. Our new 3D approach resolves these issues to optimize accuracy and quality.