

MULTI-OFFSET MIGRATION FOR ANGLE-DEPENDENT REFLECTIVITY (C-46)

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Most present-day seismic migration techniques aim at resolving only the zero-offset reflection coefficient for each grid point (depth point) in the subsurface. We intend to go one step further by extracting the angle-dependent reflection curve for each subsurface depth point of interest. Apart from structural information, angle-dependent reflectivity results can also reveal detailed velocity and density information in a subsequent elastic stratigraphic inversion step. Angle-dependent reflectivity can be obtained from seismic data by means of prestack migration (multi-source, multi-offset). After downward extrapolation of source and reflected wavefields to a specific depth level, the reflected wavefields are spatially deconvolved for the related illuminating source wavefields at each grid point of that depth level. This process is carried out in the space-frequency domain. Next, imaging is carried out by adding at each grid point all frequency contributions along lines of constant angle of incidence, yielding the desired angle-dependent reflection coefficients. The proposed method provides a rigorous alternative to conventional AVO methods. Even post-critical reflection information can be retrieved. As the technique is based on shot record migration, any subsurface geometry can be handled. Both acoustic and elastic examples will be shown during the presentation.

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