2.5D REVERSE TIME MIGRATION

Costa, Jesse Carvalho[1,3], Silva Neto, Francisco Assis[1], Schleicher, Joerg[2,3], Novais, Amelia[2,3]

[1]Faculty of Geophysics, Federal University of Para, Belem, Para, Brazil
[2]Applied Mathematics, Campinas State University, Campinas, Sao Paulo, Brazil
[3]National Institute of Petrobleum Geophysics (INCT-GP)

Reverse Time Migration (RTM) in 2.5D offers an alternative to improve resolution and amplitude when imaging 2D seismic data. Wave propagation in 2.5D assumes translational invariance of the velocity model. Under this assumption and using velocity-pressure for the acoustic wavefield we implemented a finite difference modeling algorithm in the mixed time-space/wavenumber domain. The algorithm is trulyparallel, which allows an efficient implementation in mutiprocessor computer platforms. Computing time and mainly storage requirements are reduced compared to full 3D finite difference simulation of wave propagation. These features make 2.5D RTM much more efficient than 3D RTM. Reverse time in 2.5D correctly models the geometrical spreading and the phase of seismic waveforms. This brings the possibility to recover amplitudes proportional to the earth's reflectivity using an imaging condition that compensates for uneven illumination and obliquity factor. Numerical experiments using synthetic data demonstrate the better resolution and amplitude recovery of 2.5D RTM relative to 2D reverse time migration.