

ABSTRACT

WAVEFIELD INTERPOLATION AND REGULARIZATION IN IMAGING OF MULTIPLE REFLECTION ENERGY

Methods and systems of generating seismic images from primaries and multiples are described. Methods separate pressure data into up-going pressure data and down-going pressure data from pressure data and vertical velocity data. Irregularly spaced receiver coordinates of the down-going and up-going pressure data are regularized to grid points of a migration grid and interpolation is used to fill in down-going and up-going pressure data at grid points of the migration grid. A seismic image is calculated at grid points of the migration grid based on the interpolated and regularized down-going pressure data and the interpolated and regularized up-going pressure data. The seismic images are high-resolution, have lower signal-to-noise ratio than seismic images generated by other methods, and have reduced acquisition artifacts and crosstalk effects.

FIG. 15