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Multi-azimuth 3D Seismic Exploration and Processing in the Jeju Basin, the Northern East China Sea

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Multi-azimuth(MAZ) 3D seismic exploration is one of the most advanced seismic survey methods to improve illumination and multiple attenuation for better image of the subsurface structures. 3D multi-channel seismic data were collected in two phases during 2012, 2013, and 2014 in Jeju Basin, the northern part of the East China Sea Basin where several oil and gas fields were discovered. Phase 1 data were acquired at 135° and 315° azimuths in 2012 and 2013 comprised a full 3D marine seismic coverage of 160 km2. In 2014, phase 2 data were acquired at the azimuths 45° and 225°, perpendicular to those of phase 1. These two datasets were processed through the same processing workflow prior to velocity analysis and merged to one MAZ dataset.
We performed velocity analysis on the MAZ dataset as well as two phases data individually and then stacked these three datasets separately. We were able to pick more accurate velocities in the MAZ dataset compare to phase 1 and 2 data while velocity picking. Consequently, the MAZ seismic volume provide us better resolution and improved images since different shooting directions illuminate different parts of the structures and stratigraphic features.