Geophysical Research Abstracts
Vol. 17, EGU2015-120-1, 2015
EGU General Assembly 2015

Optimization of imaging the marine seismic data including CCS expected area: A case study from offshore Korea

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Since most of marine seismic data have intrinsically multiples, it's hard to image the subsurface without removing multiples. The choice of the right multiple suppression method, when working with marine data, depends on the type of multiples and sometimes is trial and error. The major amount of multiple energy in the seismic data are related to the large reflectivity of the surface. Surface-related multiple elimination (SRME) method is effective to suppress free-surface-related multiples. Though SRME has the same limitations to apply, it is widely used because it requires no assumptions about subsurface velocities and positions and reflection coefficients of the multiple causing reflectors. Common Reflector Surface (CRS) stacking technique is based on reflector that is CRS instead of Common Mid Point (CMP). It stacks more data than conventional stacking method and increases signal to noise ratio. The purpose of this study is to address a process issue for multiple suppression with SRME and Radon transform and increasing signal to noise ratio with CRS stack on seismic data from the eastern continental margin of Korea. To remove free surface multiple, SRME is applied and Radon transform for attenuating interbed multiples. Results on the synthetic data and field data show that the combination of SRME and Radon filtering is effective for suppressing free-surface multiples and peg-leg multiples. Applying CRS stack to seismic data that multiple is eliminated increases signal to noise ratio for Carbon-dioxide Capture and Storage (CCS) expected area.