

## Receiver function analysis of airgun-OBS survey data for imaging PS converted wave

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In marine seismic survey with airguns and multicomponent ocean bottom seismographs (OBS), P-to-S converted waves are frequently observed in common receiver records. S-wave properties in sedimentary basins could be obtained from information such as traveltimes difference between P and S waves. The receiver function (RF) analysis is generally applied to passive seismic records of natural earthquakes for imaging the receiver-side structures. In this study, we attempt to apply the RF analysis to airgun-OBS survey data to extract the PS converted waves, and then image structures of the conversion boundaries.

The RF records are synthesized by deconvolution of multicomponent seismic records. After azimuth correction of the OBS orientation for two horizontal components, nine RF records can be obtained from all combinations of three components. In this study, only two RF records from vertical and radial components are analyzed. Final receiver function records are obtained by stacking over the deconvolved traces and summing the R/Z record and the time reversed Z/R record. Because the OBSs are deployed sparsely in general airgun-OBS surveys, it is difficult to synthesize the continuous seismic section as the multichannel seismic survey. We can just plot the RFs at receiver locations as the receiver-side structures.

We applied the RF analysis to the airgun-OBS survey data acquired by JAMSTEC. In the case in the northwest Pacific, the interval of OBS deployment is 6km and the airgun shot line is 237 km-long. In this area, there is wide and relatively simple sedimentary layers and the change of seafloor surface is very gentle. The final RF section shows clear PS conversion boundary that indicates the basin bottom. That is horizontally traceable and correspondent to the PP reflection boundary on the seismic section by the multi-channel seismic survey. Our result shows applicability of the RF analysis to the airgun-OBS survey data to extract the PS conversion waves and image receiver-side structures. Further analyses are applicable to the RF records to obtain detailed information related to S waves.

Keywords: receiver function, airgun-OBS survey, PS converted wave