

## Crustal structure around the Kushiro Canyon, the southern Kuril Trench, obtained by a refraction/reflection seismic survey

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The seismogenic zone in the southern Kuril Trench can be separated by the Kushiro Canyon into two segments of Tokachi-oki and Nemuro Peninsula-oki. It is suggested that large interplate earthquakes ( $\sim M8$ ) occur recurrently with an approximate interval of 50 years at those segments. The 1952 and the 2003 Tokachi-oki earthquakes are thought as recurrent events occurred in the Tokachi-oki segment. The coseismic rupture zones obtained by a seismic waveform analysis and the spatial distributions of aftershocks of those events indicate that the rupture area of the Tokachi-oki segment did not reach the Kushiro Canyon. There also indicate that there is a gap, unruptured area, with about 70 km width between those segments. However the result of the tsunami wave form analysis suggested that the coseismic slip zone of the 1952 event extend by that gap, while the 2003 event did not slip at that gap. There is some possibility that this inconsistency is caused by the characteristic of slip behavior of segmentation zone, and if so, it is expected that there are some crustal features corresponding that inconsistency.

We carried out a refraction/reflection seismic survey using ocean bottom seismometers and a multi-channel hydrophone streamer. The profile was located between the focal areas of the 2003 Tokachi-oki and the 1973 Nemuro-oki earthquakes, along the southern Kuril Trench. This is the first challenge of the trench-parallel refraction survey using OBSs in the Kuril Trench. In this study, we analyzed a P wave velocity structure and also focused the spatial variation of reflection amplitude from the plate boundary.

The result indicates that the island arc crust around the middle of profile is thicker than both ends of profile, near the focal areas of 2003 Tokachi-oki and 1973 Nemuro Peninsula-oki earthquakes. The similar thickness variation of the island arc crust is also observed at the boundary between the Tonankai and Nankai segments. It is also ascertained that there is the spatial variation of reflection strength from the plate boundary. The reflection is strong at the aftershock area of the 2003 Tokachi-oki earthquake. On the other hand, the weak reflection locates around the segmentation zone, eastward of aftershock area, and aftershocks hardly occurred near the plate boundary in this area. However, the reflection strength in the segmentation zone is heterogeneous and there partly exists a weak reflection. This weak part indicates the existence of asperity located within a stable slip area with strong reflection. Thus, that weak part possibly correspond with the eastern slip of the 1952 event.