

SCG059-P04

Room:Convention Hall

Time:May 27 10:30-13:00

Microseismicity around the Chile Triple Junction revealed by Long-Term OBSs

Masanao Shinohara^{1*}, Tomoaki Yamada¹, Hiroko Sugioka², Aki Ito², Matthew Miller³, Takehi Isse¹, Klaus Bataille³, Hikaru Iwamori⁴

¹ERI, Univ. Tokyo, ²JAMSTEC, ³Univ. Concepcion, ⁴Tokyo Institute of Technology

The Chile Triple Junction (CJT) is positioned on the Chile trench. At the CJT, spreading ridges of the Chile ridge system between the Nazca plate in the north and Antarctic plate in the south subduct beneath the South American plate. Because the southern edge of the source region of the 1960 Chile earthquake is close to the CJT, to obtain coupling between the plates is useful to consider expanse of the 1960 earthquake source region. We carried out an earthquake observation in the CJT region using Long Term Ocean Bottom Seismometers (LT-OBSs). Objectives of the observation are to obtain precise seismic activity and seismic structure around the CJT. Furthermore, to reveal deep structure is one of aims of the observation by using tomography and receiver function analysis. Long term seismic monitoring using the LT-OBSs increases reliability of results because many events can be observed.

The LTOBS was developed at the Earthquake Research Institute (ERI) of the University of Tokyo. A three-component 1-Hz seismometer is installed and seismic signals are sampled at 100 Hz using a 20-bit A/D and record the digitized data continuously on the hard disks for one year. All the components are contained in a 50-cm diameter sphere that is made of titanium alloy. The acoustic transponder for LTOBS has the functions of communication, interrogation and anchor release. An observation area is off Taitao peninsula, Chile where the ridge is subducting. The deployment of the LT-OBSs was performed on 1 March 2009 during the RV Mirai MR08-06 cruise. Due to complex seafloor topography, the topography survey using multi-narrow beam acoustic sounder was carried out to determine deploy positions. Since there was no sea floor observation in the study area, spatial intervals of five LT-OBSs were set to be approximately 30km. After the deployment of the LT-OBSs, small airgun was shot along profiles which connect deployed positions of the LT-OBSs. Simultaneously, a hydrophone streamer was towed to collect reflection data. In March 2010, all the LT-OBSs were recovered by the rescue-salvage ship of the Chilean Navy. After the recovery of the LT-OBSs, reproduction of the data were performed on processing system. Many microearthquakes were recorded and arrival times and P- and S-waves were picked up. From preliminary hypocenter location, 167 events are located within the observation network. Typical seismicity in spreading center is seen in seaward side of the trench. This indicates that the oceanic plates are subducting with spreading of two oceanic plates.