

Relationship between seismicity off Awashima inferred from Ocean Bottom Cabled Seismometers and 1964 Niigata earthquake

Takashi Shinbo^{1*}, Yuya Machida¹, Masanao Shinohara¹, Tomoaki Yamada¹, Kimihiro Mochizuki¹, Toshihiko Kanazawa²

¹ERI, ²NIED

The Niigata-Kobe Tectonic Zone (NKTZ) (Sagiya et al., 2000) is placed in the eastern margin of the Japan Sea, many large earthquakes occurred within NKTZ (e.g. 1964 Niigata earthquake, 2004 Chuetsu earthquake, and 2007 Chuetsu-oki earthquake). To understand the generation mechanism of these earthquakes and a formation of the NKTZ, it is important to obtain detailed hypocenter distribution around the NKTZ. It is difficult to locate hypocenters in offshore regions only land seismic stations and we cannot understand seismicity around NKTZ precisely.

We have been monitoring seismic activity by using Ocean Bottom Cabled Seismometers (OBCSs) from August 2010 off Awashima which the epicenter of the 1964 event is located. A seismic survey using airgun and these OBCSs was conducted to obtain seismic velocity structures around deployment of OBCSs. The data of the OBCSs enable us a precise location of hypocenters. In this study, we determine hypocenters occurred around Awashima and discuss relationship between these events and a mainshock fault plane of 1964 Niigata earthquake.

We determined 23 hypocenters using data from OBCSs. Most of these hypocenters occurred at depths ranging from 5km to 20km. These focal depths were shallower than focal depths determined by Japan Meteorological Agency. The hypocenter by OBCS form a plane dipping to the west and the dip of plane is estimated at 34 degree. The dip angle is smaller than one of the mainshock fault plane of 1964 event. We interpret that these events do not occur on the mainshock fault plane of 1964 Niigata earthquake. We need to accumulate data from OBCSs to reveal the relationship between seismic activity around Awashima recently and the fault plane of 1964 Niigata Earthquake.