Ocean bottom seismographic observation for interplate seismicity around the source area of the 1978 off-Miyagi Earthquake

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Interplate large earthquakes of M-7 class are recurring with an interval of around 40 years in the off-Miyagi region, the central part of the Japan Trench subduction zone. 25 years has already passed since the occurrence of the recent 1978 Miyagi-Oki earthquake (M7.4) and the off-Miyagi region is one of the important targets of intensive seismological researches. However, studies on the microseismicity in this area using ocean bottom seismographs (OBS) have not been made, except for the aftershock observation made by Yamada (1980), and spatial distribution pattern of the interplate seismicity have not been clarified not enough in detail. In summer of 2002, we made an OBS observation as a pilot study of a long-term repetitive OBS observation, which has been started by MEXT. Four pop-up type OBSs deployed around the rupture area of the 1978 earthquake and its northward extension. Deployments and retrievals of the instruments were made by R/V Wakataka-maru in June and by Torishima in August, respectively. Unfortunately, we lost one OBS, but the rest provided us 16bit 128Hz continuous seismographs for 74 days (Jun. 15 to Aug. 27). By adding the arrival time data picked from the OBS records to the land seismic network data by Tohoku University (TU), we relocate over 500 earthquakes whose hypocenters were located in and around this area by TU. Many events in this region form a landward dipping plane, the interface between the subducting Pacific plate and the NE Japan arc. The location of the plate boundary has been estimated from the airgun seismic survey by Ito et al. (2002) and the presently relocated hypocenters align with it.