



## Source parameters of Ulsan, Korea offshore earthquake sequence in 2012

Eun Hee Park, Sun-Cheon Park, Young Soo Jeon, Eui-Hong Hwang, Chang Wook Lee, and Young-Jean Choi  
National Institute of Meteorological Research, Seoul, 156-720, Korea, Republic Of (ungc1225@korea.kr)

Seismicity in Korea is known to be relatively low compared to China and Japan. But the seismicity seems to be relatively active historically, according to historical documents on earthquake. The magnitudes of historical earthquakes were estimated mostly to be about 4 - 6 and there were some events with magnitude over 6. Instrumental earthquakes recorded in 1978 - 2012 seem to be smaller than historical earthquakes, according to the report by the Korea Meteorological Administration (KMA). Their magnitudes are smaller than 4 in general.

Although epicenters of instrumental earthquakes seem to be randomly distributed on the entire Korean Peninsula, Some earthquakes occur intensively in several specific areas in the East Sea and the eastern region of Jeju Island. Among these areas, we studied earthquake cluster zones in the East Sea. We installed portable seismographs (8 stations) in the eastern coast and ocean bottom seismometers (4 stations) in the East Sea to study micro-earthquake activity and geotectonics. Observation was carried out from October, 2011 to April, 2012. We detected about 60 micro-earthquakes occurred around the temporal stations during the observation period. Among the seismicity observed in the period, we analyzed 6 earthquakes sequentially occurred in the Ulsan offshore on February 19 - March 27, 2012.

For analysis of Ulsan offshore earthquake sequence, we used various data sets, including permanent stations of KMA, temporary stations, and Broadband Seismograph Network (F-net) of the National Research Institute for Earth Science and Disaster Prevention (NIED). For the hypocenter determination, 1D velocity structure (Chang and Baag, 2006) and HYPOELLIPSE (Lahr, 1980) were used. The equation of Tsuboi (1954) was used for determination of magnitude. The epicenters of the earthquakes were distributed within 3 km and the focal depths were in the range of 13 - 17 km, meaning shallow events. Magnitudes were 2.0 - 3.2. The largest earthquake was M3.2 event occurred at 00:05 (UTC) on February 24, 2012. According to analysis of focal mechanism, this earthquake was oblique strike-slip fault event. Prior to the sequence, no earthquake occurred in this area, and the seismicity pattern of this sequence showed the characteristics of swarm behavior without obvious mainshock. To understand the characteristics of seismic activity in earthquake cluster zones in the East Sea, researches on swarm behavior may be needed.