Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

SCG67-16 Room:418 Time:May 2 10:15-10:30

Sea trial of tsunami and crustal movement observation buoy system in real-time under environment with high speed sea cur

TAKAHASHI, Narumi[1*] ; ISHIHARA, Yasuhisa[1] ; FUKUDA, Tatsuya[1] ; OCHI, Hiroshi[1] ; TAHARA, Jun'ichiro[1] ; MORI, Takahito[1] ; KIDO, Motoyuki[2] ; OHTA, Yusaku[2] ; HINO, Ryota[2] ; MUTOH, Katsuhiko[2] ; HASHIMOTO, Gosei[3] ; MOTOHASHI, Osamu[3] ; KANEDA, Yoshiyuki[1]

[1]Japan Agency for for Marine-Earth Science and Technology, [2]Tohoku University, [3]Japan Aerospace Exploration Agency

Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Tohoku University and Japan Aerospace Exploration Agency (JAXA) have developed real-time observation system for tsunami and crustal movement using a buoy since 2011. Although observation interval of crustal movement is generally sparse, because the timing depends on availability of observation ship, we aim to construct to observe tsunami in real-time and crustal movement when it is necessary. Because Japan is surrounded by seismogenic zones with large earthquakes and such large event brought huge damages on coastal region people, early detection is needed to reduce the severe damage. Although online cable system is best for it, the cost for the construction and implementation is huge. Therefore, we point use of the buoy as the removable temporal early detection system. The system is composed of a pressure seafloor unit with pressure sensor and acoustic transmission unit, six seafloor transponders and buoy station incorporating some loggers, transducers to communicate with seafloor systems and data transmission system to land. The seismogenic zones, however, are under the environment of high speed sea current like the Kuroshio. Therefore, we use the slack mooring on our system, but the some technical development is needed for adoption of the mooring. For example, low consumption electricity due to high power acoustic signals for the data transmission and We tried sea trial for three months in last year, and confirmed to fully resistance for high speed sea current over 5.3 knots. On the other hand, the issued to be resolved are clarified, which are on acoustic transmission between the pressure seafloor unit and the buoy, the resistance for the fishery activities and so on. We took measures for above issues and deploy the revised system at off the Kumano Basin. The observation period of the second sea trial is six months. In addition to the measures, we implement tsunami mode. In normal case, we obtain tsunami data with an interval of 15 minutes, but, it is switched to be 15 seconds in tsunami mode. The tsunami mode is triggered when a ratio of average for short period of time (STA) and that of long one (LTA) exceed the threshold level. And, we move the timing of the STA and LTA and try to detect the first arrivals of tsunami. Now, we obtain real-time tsunami and crustal movement data via iridium transmission and introduce it in this presentation.