津波・地殻変動観測ブイシステムを用いた海底圧力連続観測
Continuous bottom pressure observation by real-time buoy system for tsunami and crustal displacement

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We have developed real-time observation buoy system for tsunami and crustal displacements and carried out one-year continuous observation around eastern Nankai Trough area. Already we reported a part of the records, for example, tsunami signals brought by Off Southeastern Mie prefecture at 1st April 2016. In general, seafloor pressure observation includes many types of signals, which are crustal displacement, long-term seismic signals, tsunamis, density variation brought by sea current, ocean tide, atmospheric pressure and so on. Therefore, we attached many sensors on the buoy system. Atmospheric sensors to measure pressure, wind speed, wind direction were attached on the buoy, and their data was collected with a sampling of 10 minutes. Precise point positioning, a navigation system using four antennas, and gyro compass were also set on the buoy, and we collected navigation data including buoy position with 2 Hz sampling. Sea floor pressure data using low pass filtered of 0.023 Hz was collected with a sampling of 15 seconds and they were sent to the buoy via the wire end station using acoustic data transmission (Takahashi et al., 2015). The crustal displacement data was also collected, and the buoy has a transducer to communicate with seafloor transponders (Imano et al., 2017; Kido et al., 2018). Many types of observation were succeeded, and next step of our actions is to distinguish these signals. We applied bandpass filter changing the frequencies to the seafloor pressure data. As the results, we found that various signals with relative low frequency were recorded. Although these amplitudes were approximately 0.5 hPa, there were cases with signals with a low frequency of a few minutes, or that from approximately one hour to two hours and with relative short duration. It is possible that slow slip events with various frequencies distribute around off Enshu-nada. In addition, much disturbance was recorded on the pressure sensor during low atmospheric pressure. Such phenomena were recorded by Dense Oceanfloor Network system for Earthquakes and Tsunamis (DONET; Kaneda et al., 2015; Kawaguchi et al., 2015), it is possible that micro tsunami produced by sea surface fluctuation due to variation of atmospheric pressure. In order to clarify the cause of such phenomena, it is essential to observe from seafloor to sea surface. We have successfully observed various physical data both seafloor and sea level in this observatory system. In this presentation, we will introduce various signals recorded by many types of sensors on the real-time buoy system.

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