

Changes of seafloor electromagnetic fields in Sagami Bay during the 2006 seismic activities east off Izu Peninsula

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Recently, water in the crust has become of major interest for generation of earthquakes and magma. Electromagnetic (EM) fields are generally sensitive to the distribution, movement and state of the water. Therefore, measurements of the EM fields should provide key information to understand seismic and volcanic activities. Sagami Bay south of Tokyo is one of the most convenient regions to clarify the above idea because it is tectonically active and easy of access. In that region, the Philippine Sea plate is subducting beneath the North American plate along the Sagami Trough and the Izu Peninsula is colliding with the Honshu Arc. From this point of view, we installed an ocean bottom electromagnetometer (OBEM) on the seafloor off Hatsushima Island in Sagami Bay in January, 2005. The purposes of the observation are to investigate changes of the EM fields related to the seismic and volcanic activities and also to monitor the deep-sea environment. The OBEM was connected with the Real-Time Deep Sea Floor Observatory at the distance, 13m, from that one. The observatory was established at a depth of 1174 m by JAMSTEC in 1993, and has been linked the land station on Hatsushima Island by optical fiber cable. The OBEM has measured two horizontal components of electric field and three components of magnetic field with a sampling rate of 8 Hz for more than two years. Those observed data are transmitted through the observatory to a data logger in the land station. Furthermore, the data are transmitted to the data center of Yokohama Institute for Earth Sciences, JAMSTEC, via the internet. The magnetic field data clearly show daily variations of the geomagnetic field and geomagnetic storms. Some variations of the electric field suggest changes of bottom current. Spectra of the EM fields also indicate tidal components such as S2 and M2. Additionally, changes of the EM fields due to seismic waves have been observed when some earthquakes occurred in the eastern part of Japan. In this paper, we will mainly report on changes of the EM fields related to the 2006 seismic activities east off Izu Peninsula.