

An Offshore Experiment of Tsunami Monitoring System using GPS Buoy

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In the process of development of a GPS tsunami meter, the basic experiment in the Sagami bay, the utilization experiment off Ofunato, and the actual proof experiment off Muroto have been conducted. Five tsunamis were observed by a series of experiments. These observation results proved that the measurement accuracy of tsunami height was an order of cm. The Ministry of Land, Infrastructure, Transport and Tourism utilized the development result of the GPS tsunami meter, and started national deployment of the GPS buoy. The system has been adopted as a part of the nationwide ocean wave information system for port and harbors (NOWPHAS). The real-time tsunami records of 11th March 2011 Tohoku-Oki earthquake tsunami observed by GPS buoy of NOWPHAS. Over 6m tsunami height is observed at the Off South Iwate (Kamaishi). The Japan Meteorological Agency which observed this data updated the level of the tsunami warning to the greatest value.

Currently, the GPS buoy system uses a RTK-GPS which requires a land base for precise positioning of the buoy. This limits the distance of the buoy from the coast to, at most, 20km. In order to overcome this problem, introducing a new algorithm of precise point positioning with ambiguity resolution (PPP-AR) method and point precise variance detection (PVD) method are planned for 100km offshore observation. Also, an open source program package (RTKLIB) for super-long baseline is applicable for this purpose. So, the new experiment at off Muroto is started just now using these GPS positioning methods. The positioning results will be exhibited in real time on the internet (<http://www.tsunamigps.com/>) after tuning the system. In this experiment, the fish float buoy named Kuroshibokujou borrows for the GPS buoy under the cooperation of Kochi Prefecture.

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