

Current status and future prospect of GPS/acoustic seafloor geodetic observation by Japan Coast Guard

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We have been developing a system for precise seafloor geodetic positioning with the GPS/acoustic combination technique and deploying seafloor reference points on the landward slope of the major trenches around Japan, such as the Japan Trench and the Nankai Trough.

In March, 2008, we permanently installed an acoustic transducer on the hull of the middle-sized survey vessel "Meiyo" and started sailing observations. This improvement enabled us to obtain more stable observation results. In addition, we have started the replacement of seafloor stations since 2009 to ensure the long-term observation.

For the 2011 Tohoku-oki earthquake, we have succeeded in detecting a huge co-seismic displacement of about 24 m toward ESE and about 3 m upward at the seafloor reference point just above the hypocenter. After that, we have been carrying out observations to monitor crustal movements above the focal region.

Furthermore, to monitor seafloor movement spatially in the focal regions of Tokai, Tonankai and Nankai earthquake, we deployed nine new seafloor reference points on the landward slope of the Nankai Trough in addition to the existing six points from off-Omaezaki to off-Muroto in January 2012. We have so far carried out campaign observations about three times at each site.

In the hardware aspect, subsequent to the S/V "Meiyo" in March 2008, the S/V "Takuyo" in December 2010 and the S/V "Kaiyo" in February 2012, we installed observation equipment to the large-sized S/V "Shoyo" in December 2012.

We plan to conduct campaign observations at the seafloor reference points along the Japan Trench to monitor the crustal movement after the 2011 event. In addition, we are also going to carry out campaign observations about three times at each new seafloor reference point along the Nankai Trough.

In this presentation, we report the current status and the future prospect of GPS/acoustic seafloor geodetic observation by Japan Coast Guard.

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