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Postseismic seafloor movements following the 2011 Tohoku-oki earthquake detected by GPS/acoustic positioning

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The Hydrographic and Oceanographic Department, Japan Coast Guard, have been developing precise seafloor positioning systems using the GPS/acoustic combination technique and carrying out campaign observations along the major trenches in the Pacific Ocean, such as the Japan Trench and the Nankai Trough. For example, after the 2011 Tohoku-oki earthquake (Mw = 9.0), we detected a huge coseismic displacement of 24 m toward ESE at MYGI which is located above the epicenter. We have been continued the geodetic observations along the Japan Trench in order to detect postseismic deformation.

The results of the observations show that the displacements vary with the sites even in the directions. MYGI and KAMS had moved toward west-northwest at constant rate. MYGW had moved toward south-southeast. KAMN had moved toward northwest. FUKU and CHOS had moved toward east-southeast. In addition, the displacements at FUKU and CHOS decay with time. For vertical component, significant subsidence was detected at all sites except CHOS where no vertical displacement was detected within the accuracy range.

In this presentation, we will report and discuss the latest results of the seafloor geodetic observation along the Japan Trench.

Keywords: seafloor geodetic observation, the 2011 Tohoku Earthquake