

Uncertainty of vertical positioning of seafloor geodetic observation

*Tadashi Ishikawa¹, Shun-ichi Watanabe¹, Yusuke Yokota¹, Toshiharu Tashiro¹

1. Hydrographic and Oceanographic Department, Japan Coast Guard

The Hydrographic and Oceanographic Department of Japan Coast Guard has been developing a system for precise seafloor geodetic positioning with the GPS-Acoustic combination technique and deploying seafloor observation sites on the landward slope of the major trenches around Japan, such as the Japan Trench and the Nankai Trough.

For the precise GPS-Acoustic seafloor positioning, we are developing analysis software, which combines a kinematic GPS result and an observed acoustic travel time to get a precise position of an array of seafloor stations. In this analysis, vertical coordinates of seafloor stations and the sound velocity are not completely independent. Therefore vertical coordinates are influenced by the error of sound velocity and in consequence their accuracy is more deteriorated than that of horizontal coordinates.

In this presentation, we present a new analysis strategy for precision improvement.

Keywords: Seafloor geodetic observation, GPS-Acoustic combination technique