

Seafloor geodetic observation along the major trenches around Japan - results and future plan -

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We have been developing a system for precise seafloor geodetic observation with the GPS/Acoustic combination technique and deploying about fifteen seafloor reference points on the land-ward slope of the major trenches around Japan, such as Japan Trench and Nankai Trough. The primary purpose of our observation is to detect and monitor the crustal deformation caused by the subduction of the oceanic plate near the plate boundary. At each point, we carry out campaign observations with several days each using a survey vessel and revisit it once or twice a year. In this presentation, we summarize the results so far obtained including the error estimations and future plan.

Error estimation of the positioning result for a single campaign epoch is carried out based on the repeatability of subset data results from multiple observation days. Many cases in our campaigns show the repeatability less than 10 centimeters for the horizontal components of obtained positions. Examinations for the inter-epoch repeatability suggest that the repeatability less than 10 centimeters in the inner-epoch subset comparison implies that the final positioning result reaches accuracy of less than 5 centimeters.

In our previous presentations, we have reported time series of positioning results obtained at the Off-Miyagi seafloor reference point. They showed inter-epoch repeatability of several centimeters and represented a reasonable velocity vector in this area though the number of campaign epochs is still not enough. We will report some new results at Off-Miyagi as well as at the other area.

In 2004, we deployed a new seafloor reference point at the Off-Miyagi area. The new one is located landward from the old one in the direction perpendicular to the trench axis with the water depth of 1100m. We plan to make intensive observations at these two reference points at Off-Miyagi for the meantime and expect to detect the strain rate distribution in this direction.