

New approaches for efficient seafloor geodetic observation

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We have been developing a system for precise seafloor geodetic observation with the GPS/Acoustic combination technique and deploying 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.

By the past observations, we detected intraplate crustal movements at seafloor reference points installed off Miyagi Pref., Sagami Bay and off Tokai region, with the accuracy of a few centimeters. The estimated velocities are generally consistent with those of on-land GPS observation.

However, we can't necessarily say that we have been getting enough data. Because of using the survey vessel, there is a limit to observation time and we can't observe in bad weather. So the efficiency of the observation is one of our problems.

In this presentation, we introduce our new approaches for efficient observation.

1. Start of nighttime observation

To obtain more data, we started nighttime observations on a trial basis from last June. We carried out the observation for 16 hours per day. As a result, we could shorten the observation days per one area from 4-5 days to 2 days. We'd like to conduct the observation for 24 hours in the future.

2. Setting up the acoustic transducer on the bottom of the survey vessel

To reduce the time for raising/lowering the acoustic transducer and moving to the next observation point, the acoustic transducer was set up on the bottom of the survey vessel. It is expected that the observation efficiency is improved greatly because this enables us to conduct the observation without the deck work while sailing at a slow speed.