Submission date 2013/11/18

Cruise Summary

1. Cruise Information

● Cruise ID: KY13-08

● Name of vessel: Kaiyo

● Title of the cruise: 1. A pre-survey and the construction of the seafloor network for earthquake and tsunamis.

2. An improvement of sensor system for the bottom casing installation system.

3. A development of the installation system for a platform of a seismometer.

● Chief scientist [Affiliation]: Shuhei Nishida [JAMSTEC]

● Representative of the Science Party and Title of proposal:

Yoshiyuki KANEDA [JAMSTEC], The preliminary survey and the construction of the seafloor network for earthquake and tsunamis.

Shuhei NISHIDA [JAMSTEC], An improvement of sensor system for the bottom casing installation system.

Hiroyuki Matsumoto [JAMSTEC], A Development of the installation system for a platform of a seismometer.

● Cruise period: 20th, May, 2013 ~ 24th, June, 2013.

● Ports of departure, call and arrival:

JAMSTEC Yokosuka ~ Wakayama port ~ Sumitomo Heavy Industries, Ltd. Yokosuka Works.

● Research area: off Kumanonada and off Kii-suido

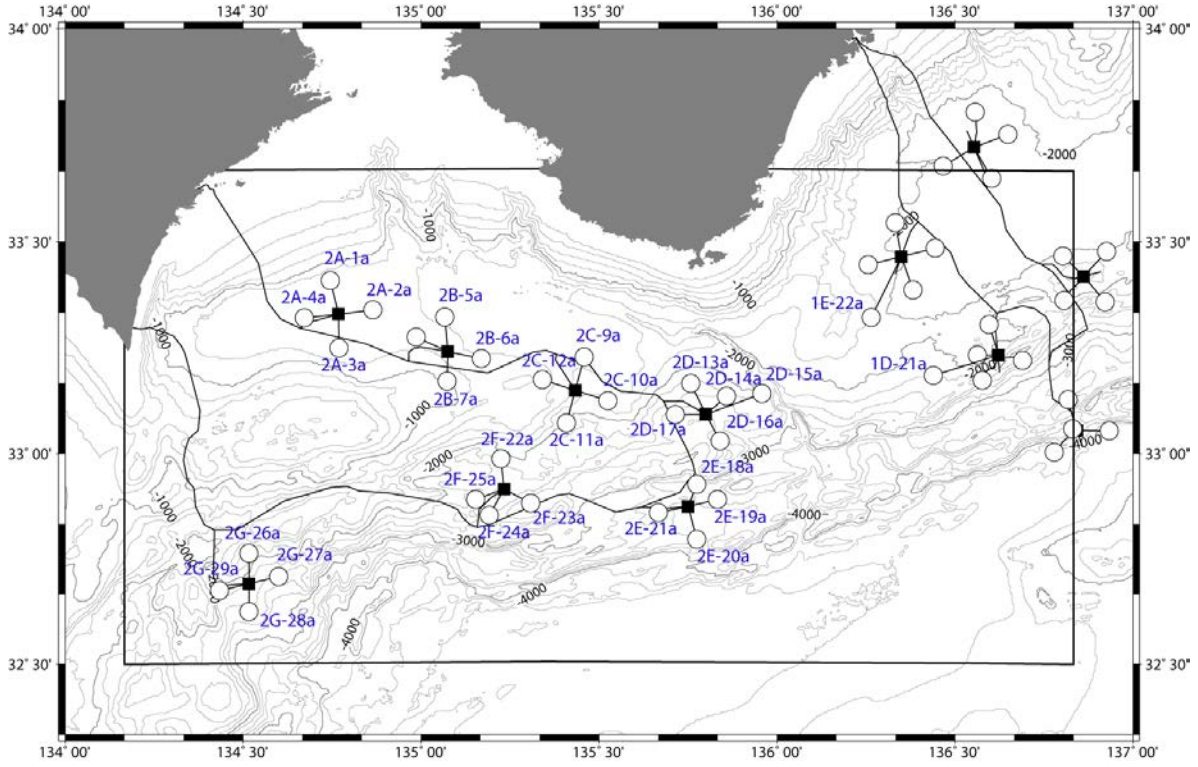

Fig.1 the Research Area of KY13-08

2. Overview of the Observation

In this cruise KY13-08, the bottom sampling using a piston corer (PC), the installation of a bottom casing, the camera survey of the cable route by 6000m-class deep-tow (DT) were carried out. And, as an improvement of a bottom casing installation system for bury installation of a seismometer, the development of the intrusion length meter and new installation system consists of a casing section and a launcher section called "Deep Mogera". The intrusion length meter and Deep Mogera were performed the evaluation in the actual sea.

(1) The Bottom Sampling using Piston Corer.

The bottom sampling using PC to evaluate that a bottom casing can be buried at the candidate point for the observation of DONET1 and DONET2. And we measured the shear stress by a hand vane about each 0.1 [m]. In this cruise, the samplings and the measurement of the shear stress were carried out 15 times in 10 candidates of the observatory. As the result, all candidates of observatory which can be installed in bottom casing were selected.

(2) Camera Survey of the cable route of DONET2 by 6000m-class Deep Tow

The bottom survey and route clearance were carried out about seven survey lines (nine dives) using Deep Tow Camera in this cruise. Six lines were suitable to the cable route. The routes of “1C-21a” and “C0010” should be rerouted and surveyed again, because these routes have rough terrain.

(3) Bottom Casing Installation

Three bottom casings were deployed for DONET1’s additional observatory “1E-22b” as BM01, BM02 and BM03. The statuses of bottom casings installation for BM01 and BM03 were good by means of acoustic signals. The casing BM02 was tilted more than 10 degrees, so it recovered from seafloor. In this cruise, new touchdown sensor was tried. This sensor can measure outcrop length of a bottom casing when the corer system touches the seafloor.

(4) Deep Mogera Deployment

Three trials were performed in the KY13-08 cruise at 1E-22 of DONET1 area. For all trials, total weight of Deep Mogera was set to be 586 kg in water (689 kg in air). Free fall height was shifted to be 3 meters higher than the first two trials.

The first trial DM01 was done in the stormy weather. Deep Mogera was hung up from the cart, and it was tied up at the end of the ship. Then, Deep Mogera was connected to the Deep Tow. Deep Tow was hung-up so that Deep Mogera was croaked under Deep Tow. Finally the Deep Mogera was sink down under the sea. All of procedure to the sea was safely done.

In the operation, we could monitor on the ship by using Deep Tow camera, and the Deep Tow (Deep Mogera) position is known by ANS of R/V Kaiyo. After checking statement of ocean bottom suitable for Deep Mogera deployment, we waited for a moment to stabilize Deep Tow. Finally, we could release Deep Mogera by sending the release commander via Deep Tow system.

The recovery procedure of Deep Mogera is easier than that of installing, because the launcher alone is hung under Deep Tow. First Deep Tow was contained to the deck. Then the launcher is contained into the cart.