Cruise Summary

1. Cruise Information

Cruise ID: KY13-17 Name of vessel: KAIYO Title of the cruise: Nankai Trough regional earthquake disaster prevention research project, and Survey and deployment for Dense Ocean-floor Network System for Earthquakes and Tsunamis Chief scientist [Affiliation]: Toshiya Kanamatsu [IFREE-JAMSTEC] *Research project 1*: Lead proponent [Affiliation] : Yoshiyuki Kaneda [DONET-JAMSTEC] Title of proposal: Nankai Trough regional Earthquake disaster Prevention research project *Research project 2*: Lead proponent [Affiliation] : Yoshiyuki Kaneda [DONET-JAMSTEC] Title of proposal: Survey and deployment for Dense Ocean-floor Network System for Earthquakes and Tsunamis (DONET) Cruise period: Nov. 8th-Nov. 17th, 2013 Ports of call: Wakayama and JAMSTEC, Yokosuka Research area: Kii-suido, Kumano nada

Map of research area: Fig.1

2. Background and purpose

KY13-17 cruise was planed to conduct two missions, one is for paleoseismological study using marine sediment, the other is for construction of real-time seafloor observatory network "DONET2" in Kii-suido and Kumanonada areas. Both projects are aiming to understand Nankai earthquake, and contribute the disaster prevention and mitigation caused from Nankai earthquake. Brief overviews of backgrounds and purposes of the projects are described below.

Research project 1: Sediment sampling by piston coring to understand earthquake recurrence off Muroto (1946 Nankai earthquake focal region) was conducted as a part of "Nankai Trough regional Earthquake disaster prevention research project".

Research project 2: As the other mission, installation of the bottom caisson for DONET2 construction was conducted. The bottom caisson is a platform of the bottom seismometer to deploy under the ocean bottom. The bottom caisson installation is carried out by using the similar system as the piston corer since the DONET1 construction. The corer contains the releaser, tilt-meter, and landing detector, which can be communicated between in-situ and the onboard in terms of acoustic signal. Additionally, accelerometer and tilt-meter are attached with the corer. These accelerometer and tilt-meter have been replaced just before the present cruise in order to be used in the deeper depth. This is why the total weight has changed

and the relevant balance would be adjusted. The first trial is to confirm the applicability of renewed the corer and to tune in necessary. If the tuning has been completed, the bottom caisson would be installed at some DONET observatories.

3. Overview of the Observation

Research project 1: 11 core samples were collected from three research area: Muroto basin, Tosabae trough, and slope off Muroto areas. Identification of event deposits induced by past earthquake, and estimate repeating recurrence cycle of earthquake will be studied using those samples. Onboard core description and measurements of magnetic susceptibility and color reflectance were conducted to characterized lithology. Off shore study will be conducted to identify event deposits induced by earthquake.

Research project 2: Five trials of the renewed installation system were conducted in the working area. Each penetration of the system into seafloor was monitored with accelerometer and tilt-meter equipped to the system. The system was recovered without installation of bottom caisson in order to make fine tuning of the weight balance based on detail analysis of tilt and acceleration during penetration.



Bathymetric map for Nankai Trough, DONET2 [KY13-17]

Fig. 1. Research area for KY13-17