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KAIREI Cruise Report

KR08-06

Research Dive by KAIKO-7000II

Philippine Sea

June, 17 – 23, 2008

Japan Agency for Marine-Earth Science and Technology
(JAMSTEC)

Content

1. Cruise Information

1.1. Cruise Number

KR08-06

1.2. Ship Name

KAIREI

1.3. Title of the Cruise

Research dive by KAIKO7000II

1.4. Title of Proposal

Study for mobile ocean bottom broadband seismic observation of the next generation

1.5. Cruise Period

June, 17 – 23, 2008

1.6. Port Call

Jamstec, Yokosuka – Futami, Chichi-jima

1.7. Research Area

Philippine Sea (south western part of Shikoku Basin)

1.8. Research Map

Refer Figure 1

2. Researchers

2.1. Chief Scientist

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2.2. Representative of Science Party

Hajime Shiobara [ERI, Univ. Tokyo]

2.3. Science Party

Hajime Shiobara [ERI, Univ. Tokyo, chief]

Toshihiko Kanazawa [ERI, Univ. Tokyo, land support]

Masanao Shinohara [ERI, Univ. Tokyo, land support]

Hiroko Sugioka [IFREE, JAMSTEC, support]

Aki Itoh [IFREE, JAMSTEC, support]

Takehi Isse [ERI, Univ. Tokyo, co-chief]

3. Observation

3.1. Observation

3.1.1. Purpose and Background

We have already developed the mobile broadband ocean bottom seismometer (BBOBS), and many practical observations and the result have been achieved since 1990. But, through the evaluation of the broadband seismic data, the noise level of horizontal components those are important in data analyses, is rather high in average and its variation in time is also large. The reason of this high noise level is assumed as the small tilt variation of the large housing sphere due to a tidal bottom current. To clear this problem, one idea of observation without tilt variation due to the bottom current is the use of small and low profile broadband sensor that enables to intrude into the sediment. Now, we are on the way to develop this new generation BBOBS (BBOBS-NX) under support of Grant-in-Aid for Scientific Research (B) during 2007–2010. Its final goal is the free fall deployment and self pop-up recovery system as same as the BBOBS in present.

3.1.2. Observations

During this cruise, we start practical test to know achievement of the noise reduction with the idea above under support of the ROV. It is impossible to do this kind of test on the land, because there is almost no low noise station similar to the deep sea floor and the condition of solid-liquid interface and existence of the bottom current. The site position of this observation is already visited to conduct three years long BBOBS observation since 2005 for the stagnant slab project (Grant-in-Aid for Scientific Research on Priority Areas, 2004–2009), that makes us easy to compare the data with the BBOBS in present. Especially, we can evaluate the difference of noise level by methods to deploy if they are put nearby and collect the data at same time. We also put an ocean bottom doppler current meter (OBDC) nearby to know relation of the noise level and strength of the bottom current. We will recover these instruments several months later to get enough length of data to evaluate correctly.

3.1.3. Method and Instruments

The prototype of BBOBS-NX is loaded on the ROV, and deployed nearby the BBOBS that has already deployed in 2007. Its sensor unit is separated from the recording unit, and the sensor is pushed into the sediment. The OBDC has been deployed before the dive of the ROV, and is moved to nearby of the BBOBS and BBOBS-NX.

3.1.4. Research Result

As we planned, BBOBS-NX and OBDC are deployed closely to the BBOBS. To stabilize the recording unit of the BBOBS-NX, we use the anchor of the OBDC. The distance to the BBOBS is about 10 m.

3.2. Cruise Log

2008/06/17

Weather: overcast/ Wind direction: SSW/ Wind force: 2/ Wave: 2 m/ Swell: 1 m/ Visibility: 6 nautical mile (12:00 JST)

08:00	Onboard
09:00	Departure from JAMSTEC
10:00-10:35	Briefing about ship's life and safety

2008/06/18

Weather: cloudy/ Wind direction: East/ Wind force: 4/ Wave: 2 m/ Swell: 1 m/ Visibility: 8 nautical mile (12:00 JST)

Transit to dive area

2008/06/19

Weather: fine but cloudy/ Wind direction: ENE/ Wind force: 4/ Wave: 3 m/ Swell: 1 m/ Visibility: 8 nautical mile (12:00 JST)

05:25-	Ranging BBOBS
05:59	XBT
06:21	Deploy a current meter (OBDC)
08:06-08:48	Calibrate location of the OBDC

09:08	Launching KAIKO (7K#416 dive) with BBOBS-NX
11:12	Bottom was in sight
11:45	KAIKO landing (4,907m)
14:00	Reset timer of the BBOBS-NX
16:50-17:15	Measure the tilt angle of the BBOBS-NX sensor and restart
17:09	KAIKO leave the bottom (49,07m)
18:47	KAIKO come up to surface

2008/06/20

Weather: cloudy/ Wind direction: NE/ Wind force: 3/ Wave: 2 m/ Swell: 1 m/ Visibility: 8 nautical mile (12:00 JST)

08:01-08:26	Ranging and data transmit of BBOBS, BBOBS-NX and OBDC
	Transit to Chichi-jima Island

2008/06/21

Weather: fine but cloudy/ Wind direction: WSW/ Wind force: 3/ Wave: 1m/ Swell: 1m/ Visibility: 8nautical mile (12:00 JST)

08:40	arrived at Futami, Chichijima Island and mooring to the buoy

2008/06/22

Weather: fine/ Wind direction: WSW/ Wind force: 3/ Wave: 1m/ Swell: 1m/ Visibility: 8nautical mile (12:00 JST)

mooring to the buoy

2008/06/23

09:15	Got off from R/V KAIREI

3.3. Dive Information

3.3.1. Dive Number

416

3.3.2. Payload

BBOBS-NX (Photo 1)

4. Acknowledgements

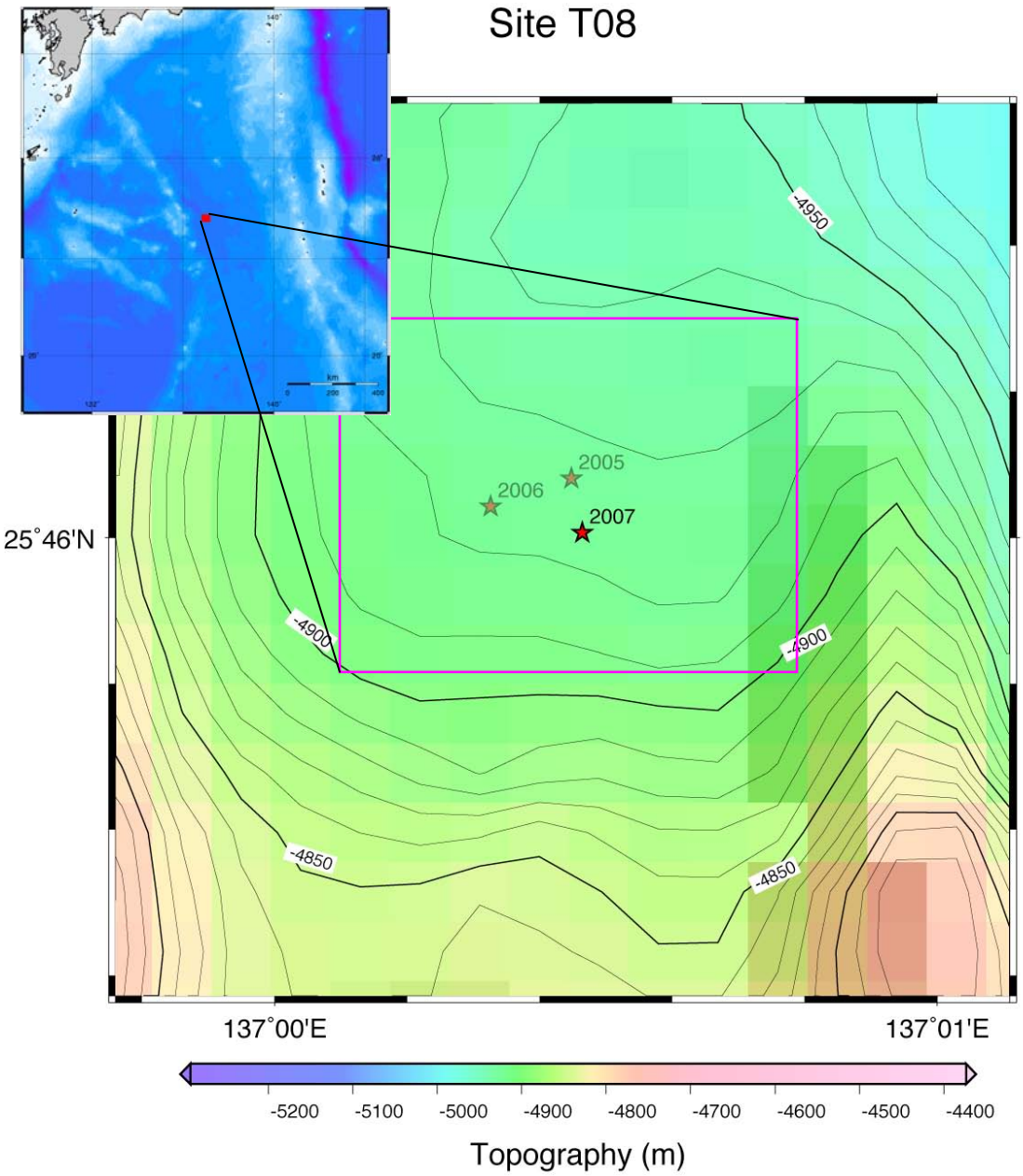
We thank for the captain and crew of R.V. KAIREI, the KAIKO team and scientific support staffs of NME in their correct work and warm support during this cruise. This study is supported by KAKENHI (19340121). The cover photo was taken by Ms. Aoki.

5. Notice on using

This cruise report is a preliminary documentation as of the end of the cruise. It may not be corrected even if changes on content (i.e. taxonomic classifications) are found after publication. It may also be changed without notice. Data on the cruise report may be raw or not processed. Please ask the Chief Scientist for the latest information before using.

Users of data or results of this cruise are requested to submit their results to Data Integration and Analysis Group (DIAG), JAMSTEC.

Figure 1



The star with 2007 indicates the position of the BBOBS already deployed in 2007. The BBOBS-NX and the OBDC are put nearby it. Starts shaded with 2005 and 2006 are positions, BBOBS were deployed and recovered before.

Photo 1

The BBOBS-NX is on the payload stage of the KAIKO-7000II.