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R/V SHINSEI MARU Cruise Report
KS-20-E01C

2019FY “Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region”

Ryukyu Arc

Jan. 25, 2020 – Jan.31, 2020

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

●**Contents**

1. Cruise Information

● Cruise ID
KS-20-E01C

● Name of vessel
R/V SHINSEI MARU

● Title of project:
Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region

● Title of cruise
2019FY “Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region”

● Chief Scientist [Affiliation]
Tsutomu Takahashi [JAMSTEC]

● Cruise period
Jan. 25, 2020 – Jan. 31, 2020

● Ports of departure / call / arrival
Departure: Kagoshima port / Arrival: Wakayama port

● Research area
Ryukyu arc

● Research map

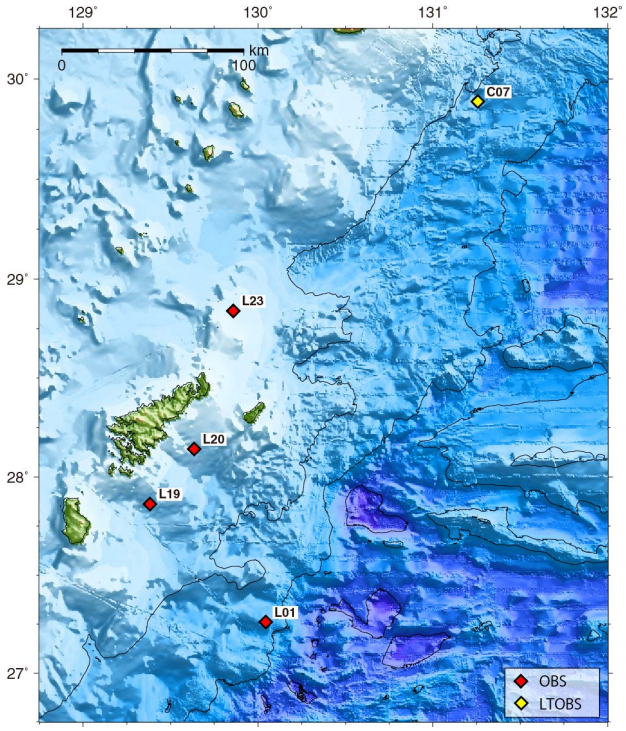

Fig. 1. Positions of short-period OBSs (red) and long-term OBSs (LTOBSs).

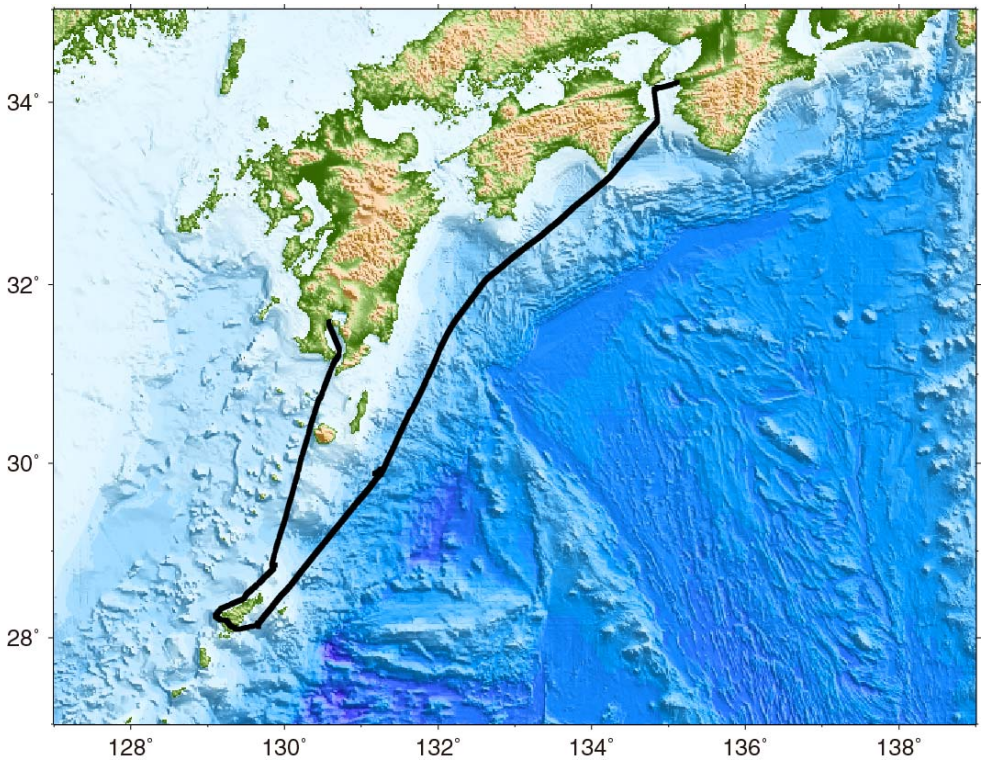

Fig.2. Ship track during KS-20-E01C cruise

2. Research Proposal and Science Party

● Title of proposal

Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region

● Representative of Science Party [Affiliation]

Shuichi Kodaira [JAMSTEC]

● Science Party (List) [Affiliation]

Shuichi Kodaira [JAMSTEC]
Yoshiyuki Kaneda [Kagawa Univ./JAMSTEC]
Daisuke Suetsugu [JAMSTEC]
Masanao Shinohara [The University of Tokyo]
Seiichi Miura [JAMSTEC]
Yasushi Ishihara [JAMSTEC]
Tsutomu Takahashi [JAMSTEC]
Yojiro Yamamoto [JAMSTEC]
Aki Ito [JAMSTEC]
Hiroko Sugioka [Kobe University]
Shinichi Tanaka [The University of Tokyo]
Yusuke Yamashita [Kyoto University]
Koichiro Obana [JAMSTEC]
Takashi Tonegawa [JAMSTEC]
Yasuyuki Nakamura [JAMSTEC]
Gou Fujie [JAMSTEC]
Ayako Nakanishi [JAMSTEC]
Ryuta Arai [JAMSTEC]
Yuka Kaiho [JAMSTEC]
Tetsuo No [JAMSTEC]

3. Research/Development Activities

3.1 Background and objectives

Permanent seismic observatories at Ryukyu subduction zone are deployed only on islands, and therefore island distribution causes a significant restriction of estimations of seismicity and underground structures. To elucidate details of seismicity, slow-earthquake activity, lithospheric structures, and plate geometry of this subduction zone, we conduct a series of passive and active seismic surveys around Ryukyu arc, as a part of research project “Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region” funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan.

From 2018FY to 2019FY, we conducted two passive seismic observations. One is a broadband seismic observation at northern Ryukyu arc, and another is a seismic observation with short-period OBSs around Amami islands. The northern Ryukyu area is one of high activity areas of slow-earthquakes such as low frequency tremors (e.g., Yamashita et al. 2015). We had deployed 5 broadband OBSs (BBOBSs) and 5 long-term OBSs (LTOBSs) off east coast of Tanega-shima during YK18-13C cruise for a near-field observation of them. Short-period OBSs around Amami islands were deployed during KR19-02C cruise for a precise investigation of seismic structures and seismicity. Most of these OBSs were successfully retrieved during KH-19-J02C cruise, but some of them were not recovered due to problems on acoustic communication or release device. In this KS-20-E01C cruise, we conducted OBS recoveries by the hyper dolphin (HPD) to investigate the causes of these problems.

3.2 OBS recovery

Two HPD dives (#2108 and # 2019) were conducted on 26 and 28 Jan. 2020, respectively. At L23, we recovered a short-period OBSs (TOBS-24N, Tokyo-Sokushin Co.) and its sinker by the HPD dive #2108. During the KH-19-J02C cruise, this OBS had not been released from seafloor regardless of stable acoustic responses from the OBS. We found that it was on sandy seafloor, and was not buried by any sediments. According to quick inspection of this OBS after the recovery, deposition of white material on the release device probably caused a mechanical problem of this device.

At L20, we conducted the HPD dive #2109, and found that OBS had been already released from seafloor. We retrieved only a sinker of this OBS. We inspected the metal band that combines the OBS and sinker, and found that OBS was probably released by incorrect actions of transponder.

At C07, HPD dive on 29 Jan. 2020 was canceled due to bad sea condition and fishing activity. We reconfirmed no acoustic response from the LTOBS at this site.

Fig 2. Recovery of OBS at L23 (HPD #2108 dive)

Fig 3. Recovery of a sinker at L20 (HPD dive #2109).

Site	North Latitude		East Longitude		Depth (m)	Instrument / Remarks
	deg	min	deg	min		
L01	27	15.6393	130	2.6733	3296	OBS (short period) / not recovered
L19	27	51.7608	129	22.9834	883	OBS (short period) / not recovered
L20	28	8.4796	129	38.1693	568	OBS (short period) / Only Sinker was recovered by HPD dive #2109
L23	28	50.3031	129	51.5671	199	OBS (short period) / Recovered by HPD dive #2108
C07	29	53.2480	131	15.4841	3001	LTOBS+TDR10K / not recovered

Table 1. Position list of OBS, BBOBS, and LTOBS.

• 4. Cruise Log

2020/1/25 (Sat)	Departure from Kagoshima Port Transit to the survey area
2020/1/26 (Sun)	HPD dive #2108 at L23 for OBS recovery
2020/1/27 (Mon)	Standby near Amami islands due to bad sea condition
2020/1/28 (Tue)	Standby near Amami islands due to bad sea condition HPD dive #2109 at L20 for OBS recovery
2020/1/29 (Wed)	Cancel of a HPD dive at C07 due to bad sea condition and fishing activity Transit to Wakayama port
2020/1/30 (Thu)	Transit to Wakayama port
2020/1/31 (Fri)	Arrival at Wakayama port

Table 2. Cruise log of KS-20-E01C

● 5. Notice on Using

This cruise report is a preliminary documentation as of the end of cruise.
This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If you are going to use or refer the data on this report, it is recommended to ask the Chief Scientist for latest status.
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E-mail: submit-rv-cruise@jamstec.go.jp

Acknowledgement

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