



R/V Kaiyo Cruise Report

KY08-06

Seismicity study off Kii peninsula, Nankai trough

July 24 – 31, 2008

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

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1. Cruise Information :

(1) Cruise number, Ship name: KY08-06, R/V Kaiyo

(2) Title of the cruise: 2008FY “Seismicity study off Kii peninsula, Nankai trough”

(3) Chief Scientist [Affiliation]: Koichiro Obana [JAMSTEC]

(4) Representative of Science Party [Affiliation]: Koichiro Obana [JAMSTEC],

(5) Title of proposal:

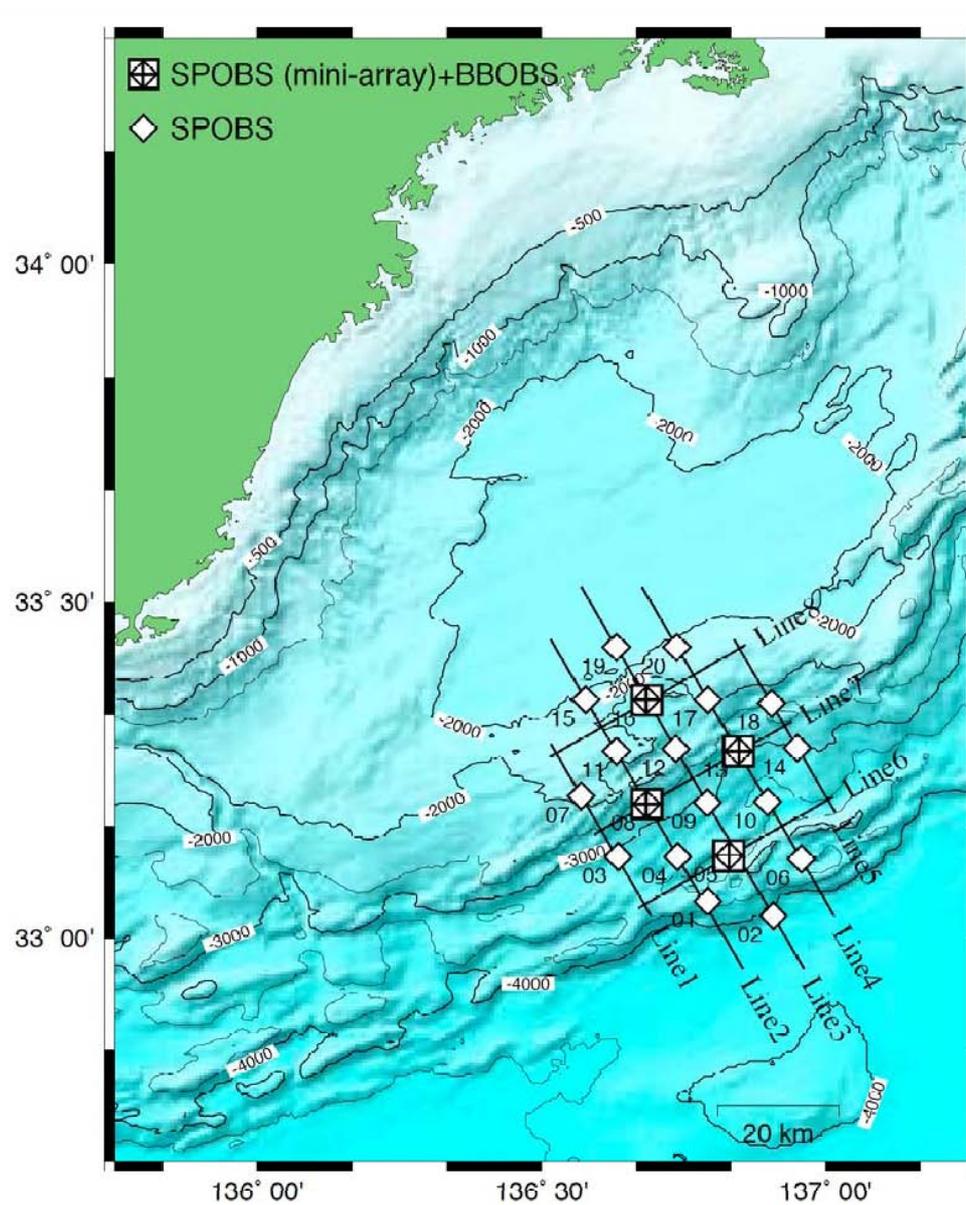
Great earthquakes in the Nankai trough

- a study for mechanisms of low-frequency events in the accretionary prism along the Nankai trough-

(6) Cruise period, Port call: 2008/7/24-7/31, from JAMSTEC (Yokosuka) to Yokosuka-Shinko

(7) Research Area: Off Kii Peninsula, Nankai trough

(8) Research Area Map:



2. Researchers

(1) Chief Scientist [Affiliation]: Koichiro Obana [JAMSTEC]

(2) Representative of Science Party [Affiliation]: Koichiro Obana [JAMSTEC],

(3) Science party list:

Hiroko Sugioka [JAMSTEC] **(on board)**

Shuichi Kodaira [JAMSTEC]

Daisuke Suetsugu [JAMSTEC]

Masataka Kinoshita [JAMSTEC]

Yasushi Ishihara [JAMSTEC]

Aki Ito [JAMSTEC]

Eiichiro Araki [JAMSTEC]

Yoshiyuki KANEDA [JAMSTEC],

Yoshio FUKAO [JAMSTEC],

3. Overview of Observation:

(1) Objectives:

This research cruise was conducted as a part of the study of “A research program concerning interaction between the Tokai, Tonankai, and Nankai Earthquakes” funded by the Ministry of Education, Culture, Sports, Science, and Technology of Japan. The objectives of this cruise are to reveal seismic activity including low frequency events in the accretionary prism along the Nankai trough and their mechanisms.

During the cruise, 36 short-period and 4 broad-band ocean bottom seismographs (OBS) were deployed off Kii peninsula in the Nankai trough. After the OBS deployment, single channel seismic (SCS) surveys were conducted to determine the location of the OBSs precisely and image the shallow structure below the OBSs.

(2) List of observation instruments:

1) Short-period ocean bottom seismometer (SPOBS)

During the cruise, 36 SPOBS were deployed at 20 sites with a horizontal spacing of about 10 km. At 4 of these 20 sites, a mini-array composed of 5 SPOBSs was deployed.

2) Broad-band ocean bottom seismograph (BBOBS)

During the cruise, 4 BBOBS were deployed near the mini-arrays of SPOBS.

3) Single-channel seismic survey (SCS)

SCS survey has been conducted along 8 lines using a GI-gun of 250 cubic inch generator and 105 cubic inch injector.

4) Others

During the cruise, bathymetry data have been recorded continuously. Water temperature profile was observed by XBT to correct sound-speed.

(3) Cruise log:

Date		Remarks
2008/7/24	Thu	Departure from JAMSTEC (Yokosuka). Transit to survey area
2008/7/25	Fri	OBS deployment
2008/7/26	Sat	OBS deployment
2008/7/27	Sun	SCS survey.
2008/7/28	Mon	SCS survey.
2008/7/29	Tue	SCS survey.
2008/7/30	Wed	SCS survey. Transit to Yokosuka
2008/7/31	Thu	Arrive at Yokosuka-Shinko

(4) Research Information:

1) OBS Deployment

During the cruise, 36 SPOBSs and 4 BBOBSs were deployed from R/V Kaiyo. The OBS positions on the seafloor were determined by acoustic ranging between R/V Kaiyo and each OBS.

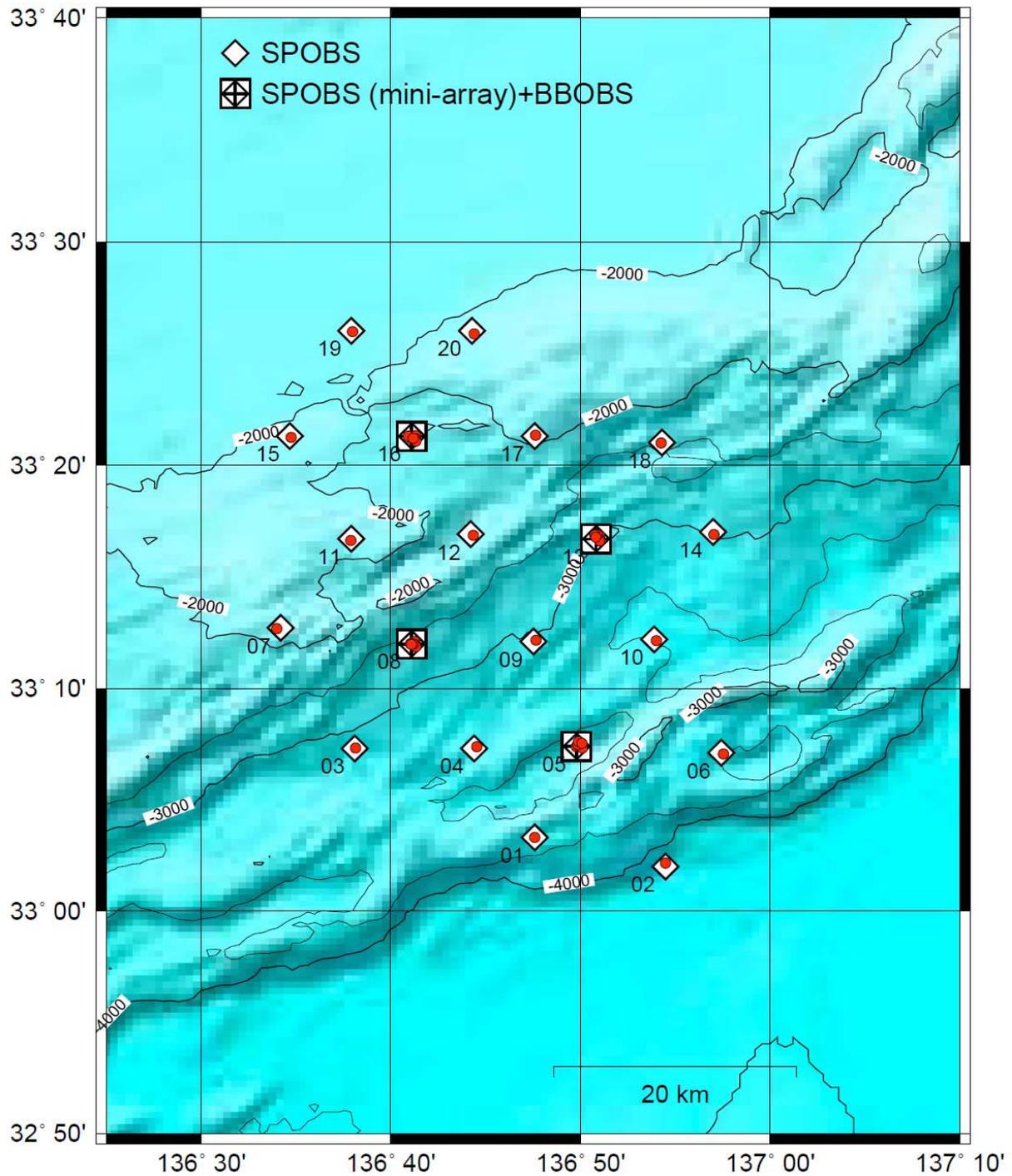


Fig.1 Map of the OBSs. Red circles are OBS locations determined by acoustic ranging.

Table 1. OBS positions.

Site	Lat. (N)	Lon. (E)	Depth (m)	Remarks
1	33.05520	136.79325	3418.1	
2	33.03599	136.90782	4376.8	
3	33.12208	136.63575	3249.9	
4	33.12324	136.74229	3311.1	
5_1	33.12306	136.82981	3838.1	
5_2	33.12341	136.83244	3838.5	
5_3	33.12207	136.83514	3829.9	
5_4	33.12460	136.83082	3834.6	
5_5	33.12692	136.83159	3832.9	
5_B	33.12566	136.83460	3835.0	BBOBS
6	33.11770	136.95909	3521.7	
7	33.21122	136.56631	1919.5	
8_1	33.20191	136.68766	2608.4	
8_2	33.19923	136.68833	2627.4	
8_3	33.19804	136.68841	2639.9	
8_4	33.19998	136.68640	2712.9	
8_5	33.20031	136.68404	2639.1	
8_B	33.19961	136.68483	2648.0	BBOBS
9	33.20286	136.79433	3058.3	
10	33.20227	136.89986	3466.1	
11	33.27705	136.63167	1986.6	
12	33.28087	136.73909	2266.1	
13_1	33.28061	136.85023	2983.7	
13_2	33.27837	136.84978	3001.3	
13_3	33.27691	136.85025	3006.8	
13_4	33.28160	136.84781	2980.6	
13_5	33.28142	136.84620	2980.7	
13_B	33.27964	136.84667	2985.0	BBOBS
14	33.28177	136.95069	3003.3	
15	33.35408	136.57924	1974.1	
16_1	33.35531	136.68868	2030.7	
16_2	33.35318	136.68820	2044.6	
16_3	33.35116	136.68846	2036.1	
16_4	33.35332	136.68470	2028.9	

16_5	33.35504	136.68199	2039.8	
16_B	33.35347	136.68646	2034.0	BBOBS
17	33.35583	136.79383	2020.2	
18	33.34995	136.90406	2538.0	
19	33.43305	136.63311	2019.9	
20	33.43139	136.73980	1920.4	

2) SCS survey

The single channel seismic survey equipment and specification is as follows.

Streamer

Manufacturer	S.I.G
Active section length	47m
Hydrophone Interval	1m
Type of Hydrophone	S.I.G.16
Hydrophone output	-90 dB, re 1V/ μ bar, \pm 1dB
Frequency flat from	10Hz to 1000Hz
Depth sensor	Yes
Preamplifier gain	39
Lead in cable	135m
Receiver depth	12m

Source

Manufacturer	Sercel
Type of airgun	GI-GUN
Volume	355cu.in[250(G)+105(I)]
Air pressure	2000 psi (140kg/cm ²)
Source depth	10m
Depth sensor	No
Gun Controller	HOT SHOT

Air Compressor

Manufacturer	Hamworthy KSE
Type of machine	Type4 TH565W100-425E x 2
Air supply Capacity	8.0 m ³ /min.

Recording System 1 (Line1,2,3,3_R,4,5,6,7,8)

Manufacturer	GEOMETRICS
Type of system	Stratavisor NX Marine Recording System
Recording format	SEG-D 8058 Rev1 4byte Floating Point
Recording length	8,000msec
Water Delay	None
Sample rate	1msec
High cut filter	None
Low cut filter	None
Recording media	HD

Recording System 2 (Line5_2)

Manufacturer	TRITON ELICS
Type of system	Delph Seismic
Recording format	SEG-Y Int.
Recording length	8,000msec
Water Delay	None
Sample rate	1msec
High cut filter	None
Low cut filter	None
Recording media	HD

GPS System

Manufacturer	Fugro
Type of system	STAR FIX 4100 LRS
DGPS Reference Station	ALL

Navigation System

Manufacturer	MARIMEX JAPAN
Type of system	NAVLOG

Shot Point Geometry

Time mode shooting	9sec
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Geodetic Parameter

Spheroid	WGS84
Semi-major Axis	6,378,137m
Inverse Flattening	298.26
Projection	U.T.M 53

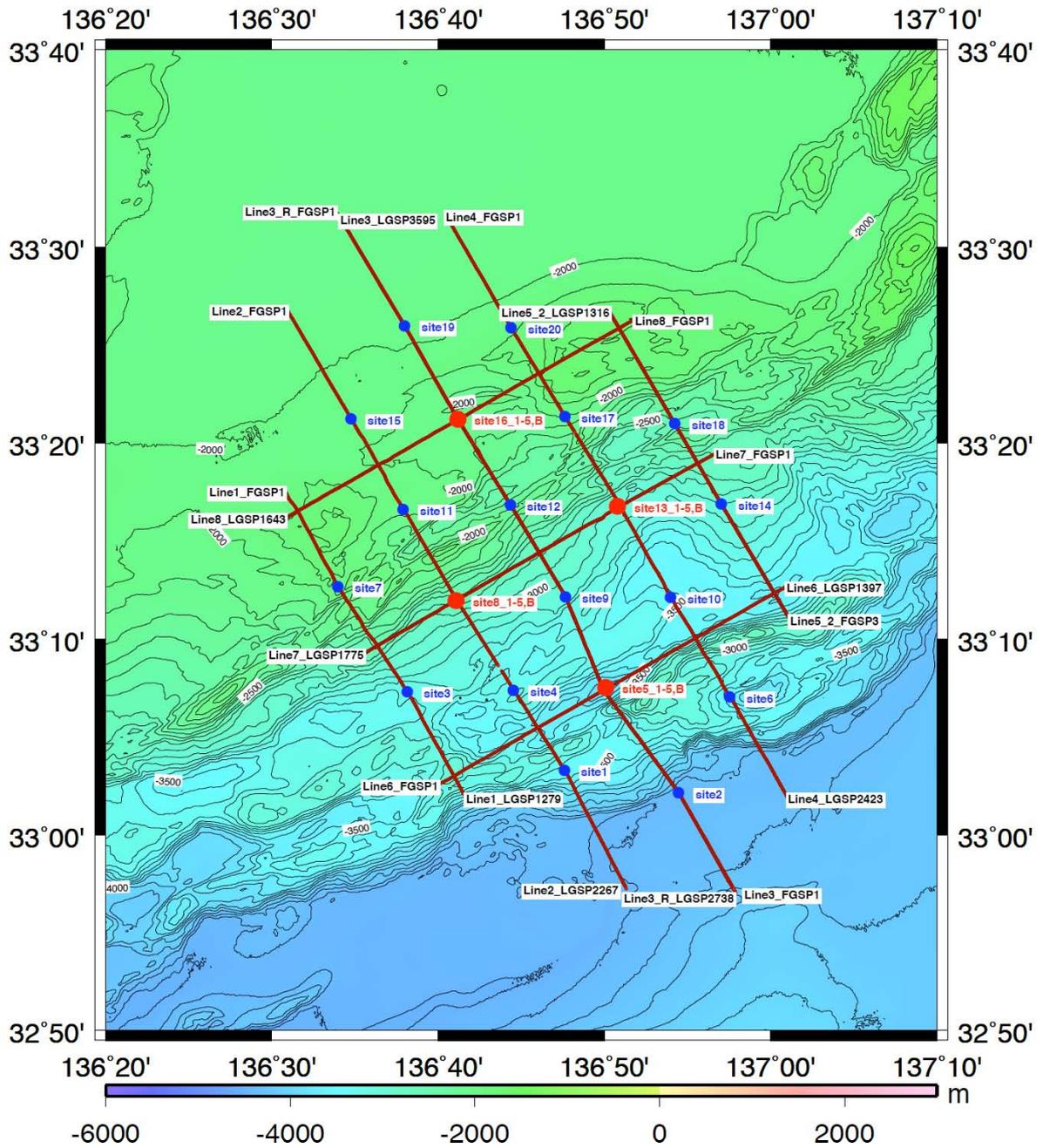


Fig.2. Single channel seismic survey lines.

Table.2 SCS line list

Line No.	Date (UTC)	Time (UTC)	Passing Point	Shot No.	Vessel Position	
					Latitude (N)	Longitude (E)
Line1	08.7.28	13:30:27	F.G.S.P	1	33-17.5140	136-30.8001
	08.7.28	16:42:55	L.G.S.P	1279	33-01.8557	136-41.6857
Line2	08.7.27	01:01:36	F.G.S.P	1	33-26.7269	136-30.9576
	08.7.27	06:45:27	L.G.S.P	2267	32-57.1671	136-51.3610
Line3	08.7.27	08:05:27	F.G.S.P	1	32-57.0904	136-57.8585
	08.7.27	17:07:40	L.G.S.P	3595	33-31.4957	136-34.0823
Line3_R	08.7.29	05:46:36	F.G.S.P	1	33-31.7994	136-33.8562
	08.7.29	12:43:11	L.G.S.P	2737	32-57.1701	136-57.7999
Line4	08.7.27	20:12:54	F.G.S.P	1	33-31.5367	136-40.4992
	08.7.28	02:18:06	L.G.S.P	2423	33-01.8431	137-01.0446
Line5	08.7.28	04:46:45	F.G.S.P	1	33-11.0863	137-01.1169
	08.7.28	08:05:40	L.G.S.P	1322	33-26.7913	136-50.2441
Line5_2	08.7.29	15:15:36	F.G.S.P	3	33-11.0646	137-01.1380
	08.7.29	18:33:38	L.G.S.P	1316	33-26.7828	136-50.2642
Line6	08.7.28	17:17:54	F.G.S.P	1	33-02.6092	136-40.0680
	08.7.28	20:48:08	L.G.S.P	1397	33-12.7471	137-01.0226
Line7	08.7.28	22:10:12	F.G.S.P	1	33-19.4474	136-56.6235
	08.7.29	02:37:23	L.G.S.P	1775	33-09.2340	136-35.4602
Line8	08.7.28	08:51:36	F.G.S.P	1	33-26.3026	136-51.7831
	08.7.28	12:58:53	L.G.S.P	1643	33-16.1622	136-30.7736

4. 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 PI(s) 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.