



R/V Kairei Cruise Report

KR08-09

Seismic study at the Izu-Ogasawara region

Jul. 27, 2008 – Aug. 12, 2008

Japan Agency for Marine-Earth Science and Technology

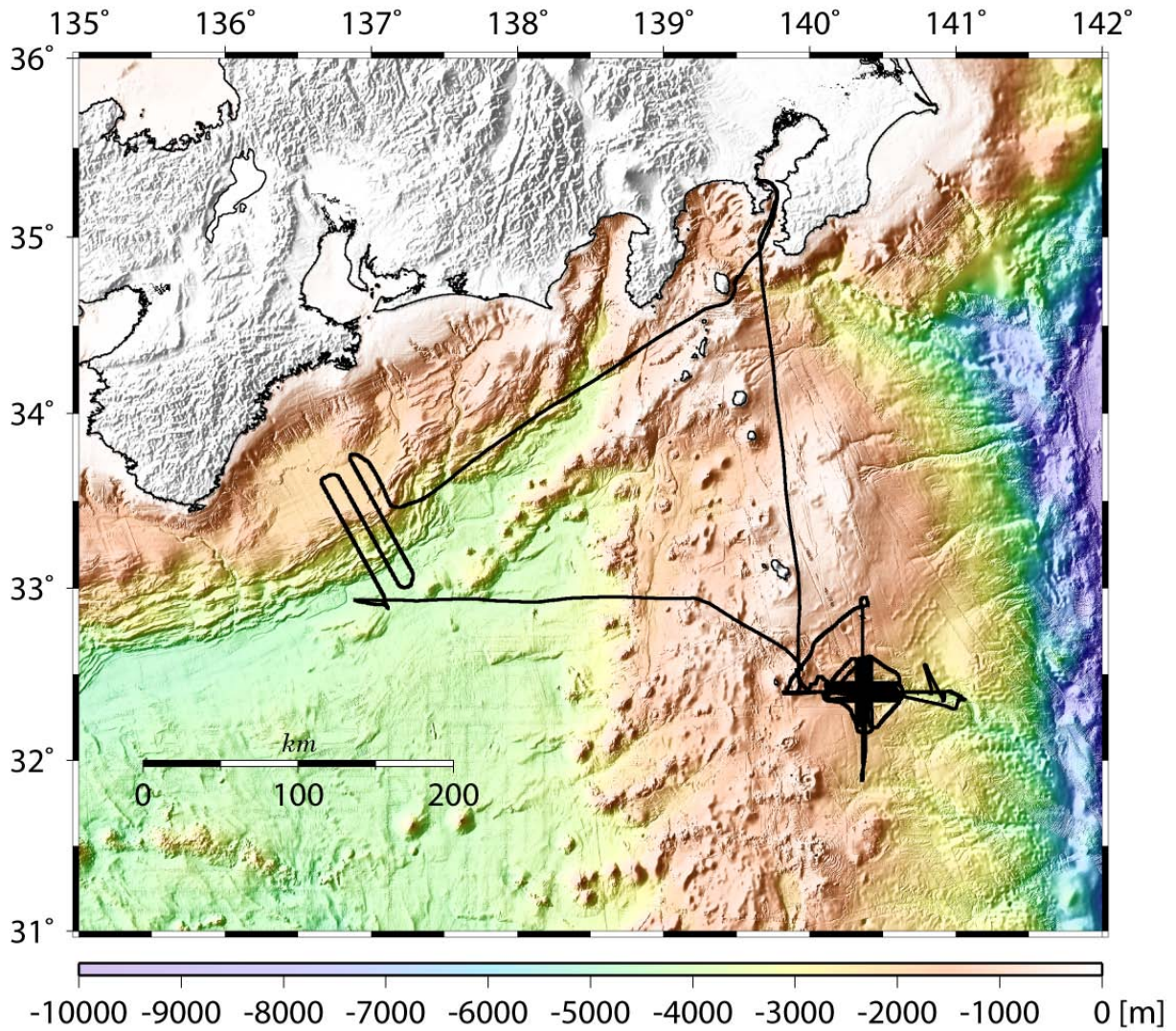
(JAMSTEC)

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1. Cruise Information :

- (1) Cruise number, Ship name: KR08-09, R/V Kairei
- (2) Title of the cruise: 2008FY “Seismic study at the Izu-Ogasawara region”
- (3) Title of proposal:
 - 1) High resolution seismic imaging in the Izu-Bonin intra-oceanic arc
- (4) Cruise period, Port call: 2008/7/28-8/12, JAMSTEC - JAMSTEC
- (5) Research Area: Izu-Ogasawara, Kumano basin
- (6) Research Map:



Ship track of KR08-09 cruise

2. Researchers

(1) Chief Scientist [Affiliation]: Shuichi KODAIRA [JAMSTEC]

(2) Representative of Science Party [Affiliation]:

1) Shuichi KODAIRA [JAMSTEC],

(3) Science part list:

1) Tetsuo NO [JAMSTEC],

Sigenobu URAKI [JAMSTEC],

3. Overview of Observation :

(1) Objectives :

IFREE have intensively conducted seismic surveys in the Izu-Ogasawara area to understand crustal evolution process in an intra-oceanic arcs since 2004. An intra-oceanic arc such as the IBM arc provides an excellent opportunity to examine the process of evolution of new crust, because an intra-oceanic island arc is less affected by pre-existing continental crust than one at the edge of a continent. Previous petrological studies have proposed that post-Archean growth of andesitic continental crust was mainly accomplished by accretion of island arc crust onto continental crust (the andesitic model). Understanding the processes of generation of new island arc crust is, therefore, fundamental to the examination of the processes by which continental crust develops on the present-day Earth. A main objectives of this cruise are to obtain high resolution seismic images around a proposed drill site of the IODP Project IBM by seismic refraction and reflection data. Moreover, we also acquired additional MCS for the IODP NantroSIZE in the Kumano basin.

(2) List of observation instruments :

1) Multi-channel seismic (MCS) reflection system

MCS survey have been conducted off-Boso and Izu-Ogasawara areas using a tuned airgun array of 7800 cu. in. and a 444-ch hydrophone streamer with 12.5-m group interval. The MCS system has been installed in 2007FY to acquire the high-resolution data and conducted sea trials at first of the cruise.

2) Ocean bottom seismometer (OBS)

In order to obtain high resolution seismic velocity image, an ocean bottom seismometer (OBS) has been deployed with 1 km interval at the proposed IODP site.

3) Bathymetry, magnetic and gravity observation

During the cruise, bathymetry, magnetic and gravity data have been recorded continuously by SEABEAM2112.004, three component magnetometer and gravity meter, respectively.

4) XBT

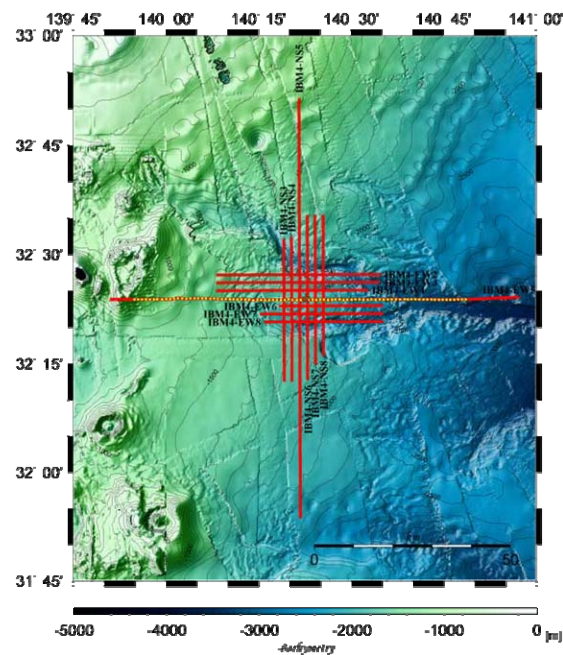
We have conducted two XBT to correct the sonic speed for the bathymetry survey.

(3) Cruise log:

Date	Remarks
2008/7/28	Departure from JAMSTEC, transit to Izu survey area, deploy OBSs
2008/7/29	deploy OBSs, refraction survey
2008/7/31	MCS survey
2008/8/01	MCS survey
2008/8/02	MCS survey
2008/8/03	MCS survey
2008/8/04	MCS survey
2008/8/05	MCS survey
2008/8/06	MCS survey
2008/8/07	MCS survey
2008/8/08	MCS survey, transit to the Kumano basin survey area
2008/8/09	MCS survey
2008/8/10	MCS survey
2008/8/11	MCS survey, transit to JAMSTEC
2008/8/12	Arrival JAMSTEC

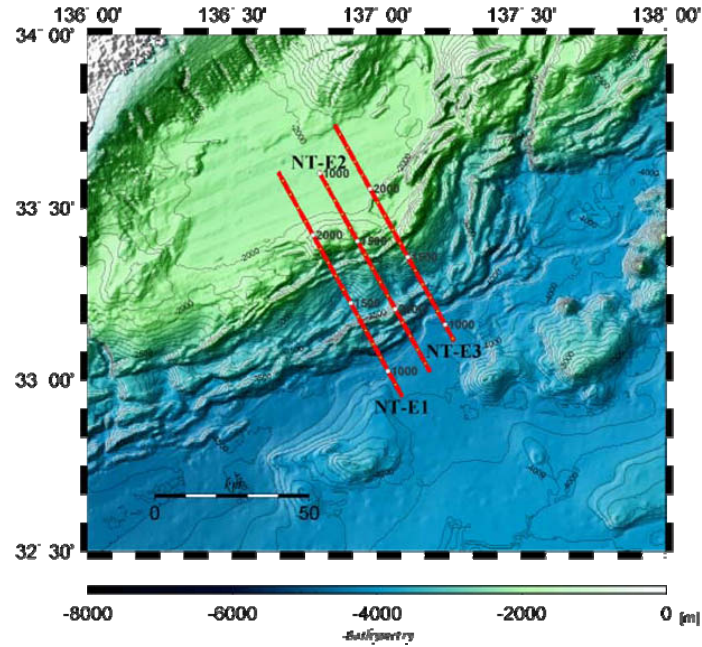
(4) Seismic lines

1) Izu area



Red lines and yellow dots indicate seismic profiles and OBSs, respectively.

2) Kumano area



Red lines indicate the seismic profiles.

(5) MCS line list

IBM4-EW5mcs	Time (UTC)		Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/7/31	13:33	32_24.16889°N	140_57.25613°E	3105	886
First good shot	2008/7/31	14:58	32_24.02402°N	140_53.59172°E	3094	1001
Last good shot	2008/8/1	14:54	32_23.81315°N	139_50.99977°E	862	2966
Last shot	2008/8/1	14:54	32_23.81315°N	139_50.99977°E	862	2966

IBM4-NS5	Time (UTC)		Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/2	3:38	32_54.12979°N	140_21.25317°E	987	881
First good shot	2008/8/2	4:15	32_51.42488°N	140_21.64984°E	1099	981
Last good shot	2008/8/2	18:21	31_53.67347°N	140_21.85047°E	2173	3115
Last shot	2008/8/2	18:21	31_53.67347°N	140_21.85047°E	2173	3115

IBM4-NS6	Time (UTC)		Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/2	23:41	32_12.70081°N	140_23.03583°E	1834	881
First good shot	2008/8/2	23:42	32_12.72792°N	140_23.03454°E	1835	882
Last good shot	2008/8/3	7:13	32_35.43333°N	140_22.95796°E	1594	1721

Last shot	2008/8/3	7:13	32_35.43333'N	140_22.95796'E	1594	1721
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IBM4-NS4	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/3	7:56	32_34.91618'N	140_20.23419'E	1595	893
First good shot	2008/8/3	8:27	32_32.45404'N	140_20.41553'E	1856	984
Last good shot	2008/8/3	12:44	32_12.50896'N	140_20.48768'E	1755	1721
Last shot	2008/8/3	12:44	32_12.50896'N	140_20.48768'E	1755	1721

IBM4-EW6	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/3	20:51	32_23.12617'N	140_13.49312'E	1708	1040
First good shot	2008/8/3	21:34	32_22.91265'N	140_18.40580'E	1838	1194
Last good shot	2008/8/4	0:13	32_22.93974'N	140_35.27717'E	2451	1723
Last shot	2008/8/4	0:13	32_22.93974'N	140_35.27717'E	2451	1723

IBM4-EW4	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/4	1:23	32_25.09357'N	140_34.76912'E	2851	890
First good shot	2008/8/4	1:55	32_25.10097'N	140_32.85466'E	2605	950
Last good shot	2008/8/4	11:21	32_25.02110'N	140_08.19234'E	1467	1723
Last shot	2008/8/4	11:21	32_25.02110'N	140_08.19234'E	1467	1723

IBM4-NS3	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/4	15:14	32_32.55808'N	140_19.13266'E	1832	980
First good shot	2008/8/4	15:19	32_32.15217'N	140_19.12920'E	1966	995
Last good shot	2008/8/4	21:13	32_12.50484'N	140_19.20774'E	1723	1721
Last shot	2008/8/4	21:13	32_12.50484'N	140_19.20774'E	1723	1721

IBM4-NS7	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/4	23:47	32_12.70515'N	140_24.60918'E	1880	881
First good shot	2008/8/5	0:31	32_14.84232'N	140_24.31391'E	1850	960
Last good shot	2008/8/5	6:11	32_35.43685'N	140_24.23207'E	1659	1721
Last shot	2008/8/5	6:11	32_35.43685'N	140_24.23207'E	1659	1721

IBM4-EW3	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP	
First shot	2008/8/5	9:54	32_26.17629'N	140_35.05420'E	2663	881
First good shot	2008/8/5	10:01	32_26.17831'N	140_34.73505'E	2698	891
Last good shot	2008/8/5	20:32	32_26.09607'N	140_08.18483'E	1395	1723
Last shot	2008/8/5	20:32	32_26.09607'N	140_08.18483'E	1395	1723

IBM4-EW7	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/5 23:10	32_21.57491'N	140_08.43255'E	1506	881
First good shot	2008/8/6 0:08	32_21.81542'N	140_15.28631'E	1862	1096
Last good shot	2008/8/6 2:45	32_21.86752'N	140_35.27928'E	2668	1723
Last shot	2008/8/6 2:45	32_21.86752'N	140_35.27928'E	2668	1723

IBM4-NS8	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/6 11:12	32_12.75757'N	140_25.61471'E	1913	881
First good shot	2008/8/6 11:53	32_16.00515'N	140_25.59199'E	1908	1001
Last good shot	2008/8/6 15:27	32_35.46304'N	140_25.50218'E	1677	1720
Last shot	2008/8/6 15:27	32_35.46304'N	140_25.50218'E	1677	1720

IBM4-EW8	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/7 4:20	32_20.72657'N	140_11.27546'E	1577	970
First good shot	2008/8/7 5:00	32_20.74244'N	140_16.05727'E	1794	1120
Last good shot	2008/8/7 7:36	32_20.78865'N	140_35.28089'E	2817	1723
Last shot	2008/8/7 7:36	32_20.78865'N	140_35.28089'E	2817	1723

IBM4-EW2	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/7 9:49	32_27.25685'N	140_34.98847'E	2311	881
First good shot	2008/8/7 9:50	32_27.25685'N	140_34.98847'E	2302	883
Last good shot	2008/8/7 16:54	32_27.18195'N	140_08.17774'E	1414	1723
Last shot	2008/8/7 16:54	32_27.18195'N	140_08.17774'E	1414	1723

NT-E1	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/9 3:56	32_57.03013'N	137_05.28906'E	4236	810
First good shot	2008/8/9 3:57	32_57.08214'N	137_05.26805'E	4237	812
Last good shot	2008/8/9 19:01	32_36.20242'N	136_39.62205'E	2074	2463
Last shot	2008/8/9 19:01	32_36.20242'N	136_39.62205'E	2074	2463

NT-E2	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/9 21:00	33_37.20639'N	136_47.44461'E	2050	950
First good shot	2008/8/9 21:12	33_36.25713'N	136_48.06511'E	2052	990
Last good shot	2008/8/10 4:24	33_01.47479'N	137_11.07683'E	4232	2461
Last shot	2008/8/10 4:24	33_01.47479'N	137_11.07683'E	4232	2461

NT-E3	Time (UTC)	Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/8/10 6:58	33_06.81854'N	137_16.11011'E	4220	881

First good shot	2008/8/10	6:59	33_06.86587'N	137_16.07895'E	4223	883
Last good shot	2008/8/10	17:04	33_44.36798'N	136_51.37553'E	1980	2467
Last shot	2008/8/10	17:04	33_44.36798'N	136_51.37553'E	1980	2467

(6) OBS line list

IBM4-EW5obs_0	Time (UTC)		Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/7/29	12:11	32_24.04814'N	140_54.20471'E	3279	996
First good shot	2008/7/29	12:13	32_24.03599'N	140_54.07761'E	3273	997
Last good shot	2008/7/30	3:22	32_23.83270'N	140_19.78943'E	1754	1266
Last shot	2008/7/30	3:29	32_23.78864'N	140_19.40969'E	1752	1269

IBM4-EW5obs_1	Time (UTC)		Latitude (N)	Longitude (E)	Depth (m)	SP
First shot	2008/7/30	9:01	32_23.83443'N	140_19.78872'E	1754	1266
First good shot	2008/7/30	9:01	32_23.83443'N	140_19.78872'E	1754	1266
Last good shot	2008/7/30	20:44	32_23.82717'N	139_48.96614'E	1002	1508
Last shot	2008/7/30	20:44	32_23.82717'N	139_48.96614'E	1002	1508

(7) OBS list

Site	OBS Calibration position						Remarks
	Lat(N)	Lon(E)	Depth	x	y	z	
1	32_23.8238	139_54.9356	745.8	-79.3	85.3	-36.8	
2	32_23.8244	139_55.5356	867.7	-86.0	24.0	-20.7	
3	32_23.8328	139_56.1644	951.7	-78.0	8.0	-5.7	
4	32_23.8207	139_56.8035	997.7	-108.0	8.0	4.3	
5	32_23.8485	139_57.4502	1001.6	-64.0	20.0	21.4	
6	32_23.8406	139_58.1135	1052.9	-86.0	58.0	2.1	
7	32_23.8758	139_58.6275	1099.2	-28.0	-138.0	5.8	
8	32_23.8397	139_59.4133	1152.3	-102.0	92.0	-16.3	
9	32_23.8965	140_00.0931	1148.0	-4.0	156.0	9.0	
10	32_23.8883	140_00.7092	1128.9	-26.0	120.0	37.1	
11	32_23.9127	140_01.3878	1173.2	12.0	182.0	24.8	
12	32_24.0029	140_01.9784	1181.3	172.0	106.0	17.7	
13	32_23.9567	140_02.7003	1249.5	80.0	236.0	-18.5	
14	32_23.9386	140_03.3675	1307.3	40.0	280.0	20.7	
15	32_23.9485	140_04.0269	1320.9	52.0	312.0	7.1	

16	32_23.9466	140_04.6724	1327.3	42.0	322.0	-2.3	
17	32_23.9499	140_05.2974	1334.5	42.0	300.0	-0.5	
18	32_23.9522	140_05.9428	1447.8	40.0	310.0	-61.8	
19	32_23.9511	140_06.5615	1405.4	32.0	278.0	38.6	
20	32_23.9371	140_07.2477	1422.4	0.0	352.0	-5.4	
21	32_23.9467	140_07.8664	1467.7	12.0	320.0	-13.7	
22	32_23.9238	140_08.4596	1517.3	-36.0	248.0	-49.3	
23	32_23.9085	140_09.1317	1547.0	-70.0	300.0	-35.0	
24	32_23.8931	140_09.7670	1556.9	-104.0	294.0	14.1	
25	32_23.8646	140_10.4341	1567.7	-162.0	338.0	-7.7	
26	32_23.8675	140_11.0056	1589.1	-162.0	232.0	-1.1	
27	32_23.8488	140_11.6472	1628.5	-202.0	236.0	28.5	
28	32_23.8299	140_12.2735	1626.7	-242.0	216.0	8.3	
29	32_23.8337	140_12.9343	1774.1	-240.0	250.0	-50.1	
30	32_23.8094	140_13.5453	1680.6	-290.0	206.0	-2.6	
31	32_23.6929	140_14.2188	1771.7	-510.0	260.0	-92.7	
32	32_23.7874	140_14.8731	1757.8	-340.0	284.0	-2.8	
33	32_23.7716	140_15.4842	1759.1	-374.0	240.0	-22.1	
34	32_23.7708	140_16.1219	1803.8	-380.0	238.0	-39.8	
35	32_23.7679	140_16.7840	1779.9	-390.0	274.0	-2.9	
36	32_23.7788	140_17.4231	1777.8	-374.0	274.0	-18.8	
37	32_23.7714	140_18.0430	1758.0	-392.0	244.0	-8.0	
38	32_23.7802	140_18.6795	1762.4	-380.0	240.0	-21.4	
39	32_23.7725	140_19.3109	1754.3	-398.0	228.0	-11.3	
40	32_23.8624	140_19.9130	1752.2	-236.0	170.0	-3.2	
41	32_23.7790	140_20.5662	1761.9	-394.0	192.0	-3.9	
42	32_23.7691	140_21.2587	1773.7	-416.0	276.0	-11.7	
43	32_23.7678	140_21.8991	1777.8	-422.0	278.0	-1.8	
44	32_23.7892	140_22.5573	1802.2	-386.0	308.0	-11.2	
45	32_23.7695	140_23.1760	1823.1	-426.0	276.0	-19.1	
46	32_23.7908	140_23.8354	1832.3	-390.0	308.0	-15.3	
47	32_23.7763	140_24.4427	1846.9	-420.0	258.0	-15.9	
48	32_23.8040	140_25.0779	1871.3	-372.0	252.0	-14.3	
49	32_23.8100	140_25.6826	1886.2	-364.0	198.0	-8.2	
50	32_23.7781	140_26.3394	1919.6	-426.0	226.0	-12.6	
51	32_23.7980	140_26.9734	1954.9	-392.0	218.0	-13.9	
52	32_23.8309	140_27.5079	1986.2	-334.0	54.0	-7.2	
53	32_23.8194	140_28.2108	2030.7	-358.0	154.0	-12.7	

54	32_23.7764	140_28.8613	2062.7	-440.0	172.0	-0.7	
55	32_23.7950	140_29.4685	2130.0	-408.0	122.0	-28.0	
56	32_23.7897	140_30.1714	2174.0	-420.0	222.0	-28.0	
57	32_23.8235	140_30.7633	2206.5	-360.0	148.0	-23.5	
58	32_23.8268	140_31.4265	2223.6	-356.0	186.0	-13.6	
59	32_23.8117	140_32.0657	1989.7	-386.0	186.0	277.3	(*1)
60	32_23.8048	140_32.7574	2154.1	-401.0	268.6	173.9	(*1)
61	32_23.8290	140_33.3744	2136.3	-358.0	234.0	206.7	(*1)
62	32_23.8136	140_34.0544	1894.9	-388.0	298.0	437.1	(*1)
63	32_23.8286	140_34.7164	1976.2	-362.0	334.0	393.8	(*1)
64	32_23.8144	140_35.3414	1873.3	-390.0	312.0	516.7	(*1)
65	32_23.8487	140_36.0188	2028.7	-328.0	372.0	409.3	(*1)
66	32_23.8332	140_36.6655	1999.0	-358.0	384.0	551.0	(*1)
67	32_23.8436	140_37.3174	2007.9	-340.0	404.0	670.1	(*1)
68	32_23.8476	140_37.9858	1921.5	-334.0	450.0	844.5	(*1)
69	32_23.8525	140_38.7529	1972.5	-326.0	494.0	1083.5	(*1)
70	32_23.8453	140_39.2615	3094.0	-340.0	446.0	-19.0	
71	32_23.8566	140_39.8890	1913.6	-320.0	428.0	1162.4	(*1)
72	32_23.8495	140_40.5179	2038.5	-334.0	412.0	1052.5	(*1)
73	32_23.8391	140_41.1315	1929.9	-354.0	372.0	1146.1	(*1)
74	32_23.8405	140_41.8025	2113.6	-352.0	422.0	983.4	(*1)
75	32_23.8310	140_42.4108	1946.7	-370.0	374.0	1181.3	(*1)
76	32_23.8453	140_43.0755	1874.3	-344.0	414.0	1264.7	(*1)
77	32_23.8032	140_43.6572	1824.6	-422.0	324.0	1338.4	(*1)
78	32_23.8012	140_44.3154	1898.6	-426.0	354.0	1273.4	(*1)
79	32_23.8055	140_44.9073	2142.8	-418.0	280.0	1056.2	(*1)
80	32_23.8077	140_45.5425	1989.5	-414.0	274.0	1228.5	(*1)
81	32_23.7978	140_46.1587	2074.5	-432.0	238.0	1154.5	(*1)
82	32_23.8065	140_46.7862	2080.9	-416.0	220.0	1064.1	(*1)
83	32_23.8323	140_47.4304	1930.9	-368.0	228.0	1224.1	(*1)
84	32_23.8450	140_48.0504	2027.0	-344.0	198.0	1194.0	(*1)
85	32_23.8230	140_48.6678	2172.6	-384.0	164.0	1031.4	(*1)

(*1)OBS Calibration position ... position 25 min after deployment

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.