



R/V Kaiyo Cruise Report

KY08-E03

Seismic imaging in the Izu-Bonin intra-oceanic arc

Nov. 06, 2008 – Nov. 21, 2008

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

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1. Cruise Information :

(1) Cruise number, Ship name: KY08-E03, R/V Kaiyo

(2) Title of the cruise: “Seismic imaging in the Izu-Bonin intra-oceanic arc”

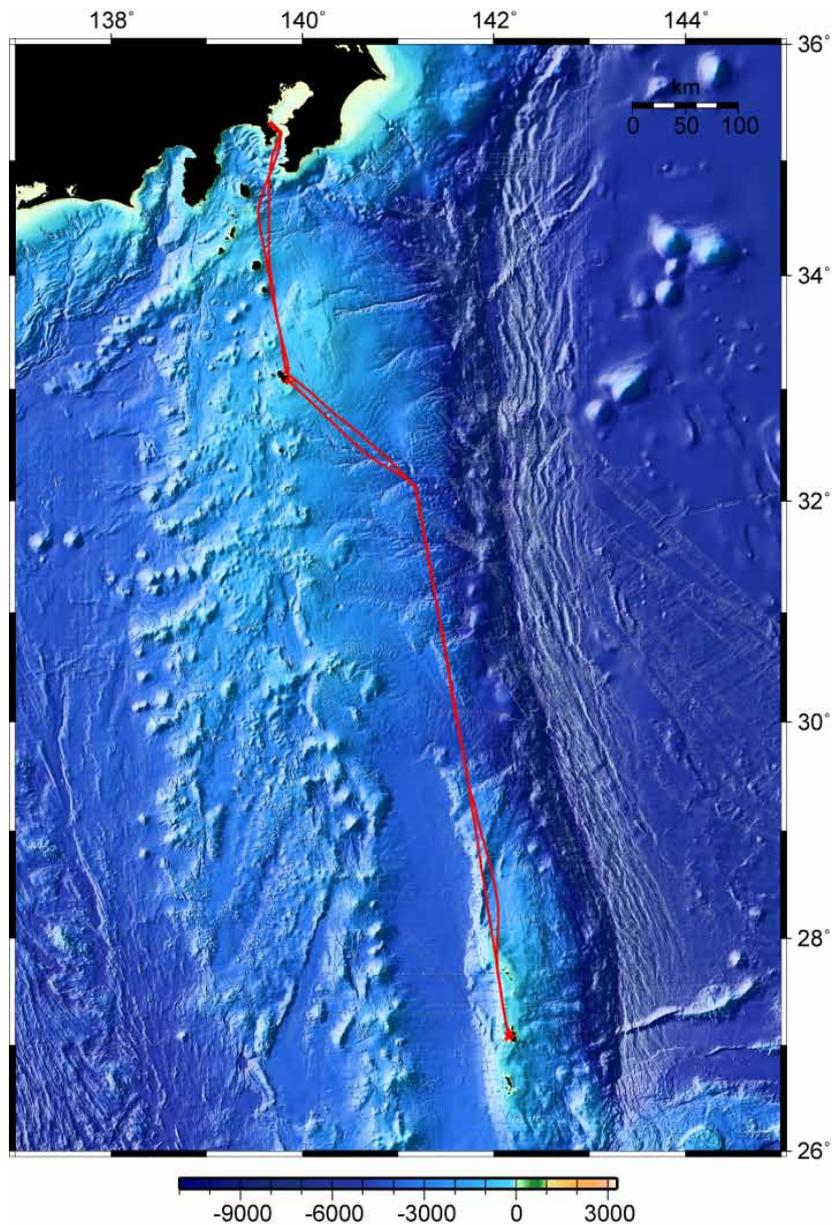
(3) Title of proposal:

Crustal growth of the Izu-Ogasawara oceanic island arc –Seismic study for IODP
Project IBM-,

(4) Cruise period, Port call: 2008/11/6-11/21, JAMSTEC - JAMSTEC

(5) Research Area: Izu-Ogasawara

(6) Research Map:



Ship track of KY08-E03 cruise

2. Researchers

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

(2) Representative of Science Party [Affiliation]:

1) Yoshio FUKAO [JAMSTEC]

(3) Science part list:

1) Kaoru TAKIZAWA [JAMSTEC]

2) Katsuo KATSUMATA [JAMSTEC]

3. Overview of Observation :

(1) Objectives :

IFREE have conducted seismic surveys in the Izu-Ogasawara area to understand crustal evolution process in intra-oceanic arcs since 2004. An intra-oceanic arc such as the IBM arc provides an excellent place 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. 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. 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. In addition to the seismic survey, we attempt to examine possible relationships between the fine seismic reflection image of sea water, which simultaneously obtained by MCS survey for sub-seafloor, and the velocity fine structures obtained by XCP and XCTD observations.

(2) List of observation instruments :

1) Refraction seismic survey

A Refraction seismic survey was conducted in the southeast off Tori-shima (KT04 line), the Izu-Ogasawara area, using the airgun array of R/V Kairei (KR08-E03 cruise) and ocean bottom seismographs (OBSs).

2) Deployment and recovery of ocean bottom seismographs (OBSs)

We deployed and recovered OBSs on the KT04 line.

3) Current and conductivity observations

We have conducted expendable current profiler (XCP) and expendable conductivity depth profiler (XCTD) on the KT04 line.

4) Bathymetry observation

During this cruise, bathymetry data have been recorded continuously by SEABEAM2112.

5) Sea current observation

During this cruise, sea current data have been recorded continuously by Acoustic Doppler Current Profiler (ADCP).

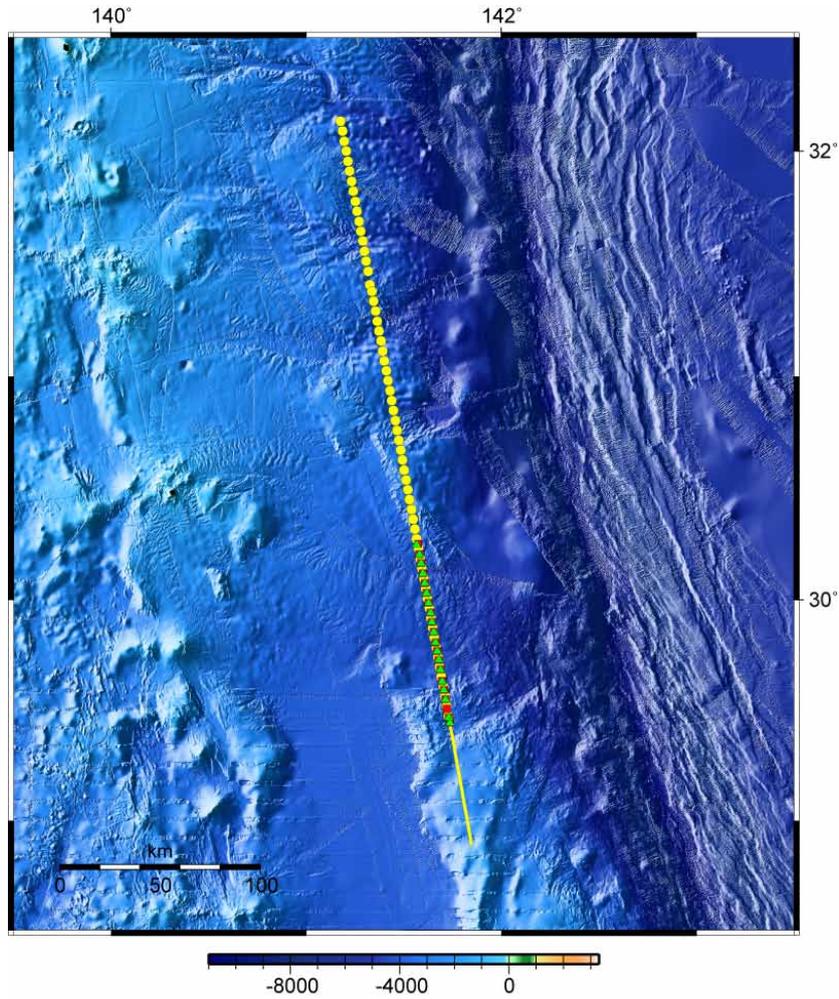
6) Temperature and Conductivity observation for the correction of sonic speed

We have conducted two expendable bathy thermograph (XBT) and expendable conductivity temperature depth (XCTD) to correct the sonic speed for the bathymetry survey.

(3) Cruise log:

Date	Remarks
2008/11/06	Departure from JAMSTEC, transit to Hachijo-jima to escape from bad sea condition
2008/11/07	Standby, transit to Izu survey area
2008/11/08	Deployment of OBSs
2008/11/09	Deployment of OBSs, observation of XCP and XCTD
2008/11/10	Transit to Chichi-jima to escape from bad sea condition
2008/11/11	Standby
2008/11/12	Standby
2008/11/13	Standby
2008/11/14	Standby
2008/11/15	Transit to Izu survey area
2008/11/16	Recovery of OBSs
2008/11/17	Recovery of OBSs
2008/11/18	Recovery of OBSs, transit to Hachijo-jima to escape from bad sea condition
2008/11/19	Standby
2008/11/20	Transit to JAMSTEC
2008/11/21	Arrival at JAMSTEC

(4) Survey line



Yellow line and dots indicate seismic profiles and OBSs, respectively.

Red squares and green triangles show observation points of XCP and XCTD.

(5) OBS line list

KT04	Time (UTC)		Latitude (N)	Longitude (E)	SP
First shot	2008/11/08	05:18	28_53.5377'N	141_50.8470'E	681
First good shot	2008/11/08	05:18	28_53.5911'N	141_50.8365'E	683
Last good shot	2008/11/09	07:10	30_57.9292'N	141_25.4104'E	5348
Last shot	2008/11/09	07:10	30_57.9292'N	141_25.4104'E	5348

(6) OBS list

Site	Cast			Remarks
	Lat(N)	Lon(E)	Depth	

10	32_07.9102	141_10.5754	3595.0	
11	32_05.2744	141_11.1634	3539.0	
12	32_02.5963	141_11.7343	3620.0	
13	31_59.9566	141_12.3035	3280.0	
14	31_57.3031	141_12.8729	3375.0	
15	31_54.6586	141_13.4322	3203.0	
16	31_51.9982	141_14.0085	3195.0	
17	31_49.3444	141_14.5696	3473.0	
18	31_46.6763	141_15.1427	3627.0	
19	31_44.0461	141_15.6966	3685.0	
20	31_41.3823	141_16.2590	3744.0	
21	31_38.7224	141_16.8249	4002.0	
22	31_36.0790	141_17.3863	4364.0	
23	31_33.4088	141_17.9611	3795.0	
24	31_30.7635	141_18.5125	3636.0	
25	31_28.1109	141_19.0770	3626.0	Not recovery
26	31_24.4500	141_19.6463	3507.0	
27	31_22.7786	141_20.1931	3312.0	
28	31_20.1176	141_20.7379	3329.0	Not recovery
29	31_17.4930	141_21.3191	3695.0	
30	31_14.8242	141_21.8561	4025.0	
31	31_12.1624	141_22.4095	4024.0	
32	31_09.5068	141_22.9974	3876.0	
33	31_06.8598	141_23.5192	3592.0	
34	31_04.2005	141_24.0974	3437.0	
35	31_01.5392	141_24.6698	3326.0	
36	30_58.8859	141_25.1987	3333.0	
37	30_56.2305	141_25.7624	3404.0	
38	30_53.5716	141_26.3147	3631.0	
39	30_50.9087	141_26.8467	3763.0	
40	30_48.2522	141_27.4187	3564.0	
41	30_45.6109	141_27.9706	3288.0	
42	30_42.9462	141_28.5275	3201.0	
43	30_40.2909	141_29.0744	2955.0	
44	30_37.6215	141_29.6198	2957.0	
45	30_34.9712	141_30.1676	2966.0	
46	30_32.3316	141_30.7309	2858.0	

47	30_29.6769	141_31.2796	3040.0	
48	30_27.0229	141_31.8312	3257.0	
49	30_24.3632	141_32.3739	3331.0	
50	30_21.7056	141_32.9146	3292.0	
51	30_19.0503	141_33.4640	3670.0	
52	30_16.3927	141_34.0152	3820.0	
53	30_13.7416	141_34.5679	3995.0	
54	30_11.0828	141_35.1067	4077.0	
55	30_08.4281	141_35.6633	4251.0	
56	30_05.7702	141_36.2006	4176.0	
57	30_03.1148	141_36.7461	4143.0	
58	30_00.4616	141_37.2897	4197.0	
59	29_57.8098	141_37.8473	4227.0	
60	29_55.1420	141_38.3898	4256.0	(*1)
61	29_52.4869	141_38.9308	4331.0	(*2)
62	29_49.8349	141_39.4718	4347.0	(*2)
63	29_47.1584	141_40.0057	4411.0	(*2)
64	29_44.5176	141_40.5488	4409.0	(*2)
65	29_41.8551	141_41.0961	4348.0	(*2)
66	29_39.1988	141_41.6247	4137.0	(*2)
67	29_36.5327	141_42.1746	4096.0	(*2)
68	29_33.8755	141_42.7030	3772.0	(*2)
69	29_31.2091	141_43.2567	3697.0	(*2)
70	29_28.5611	141_43.7721	3697.0	(*2)

(*1) Land after last shooting.

(*2) Cast after last shooting.

(7) XCP and XCTD list

	Date	Time	Latitude	Longitude	Comment
XCP 01	2008/11/9	8:26:08	30-15.126N	141-34.497E	
XCTD 01	2008/11/9	8:47:30	30-14.819N	141-33.961E	XCTD data are not usable as taken under an excessive boat speed.
XCP 02	2008/11/9	9:29:30	30-12.323N	141-34.826E	
XCTD 02	2008/11/9	9:37:30	30-12.147N	141-34.842E	XCTD data are not usable as taken under an excessive boat speed.
XCP 03	2008/11/9	10:19:05	30-09.868N	141-35.342E	

XCTD 03	2008/11/9	10:21:00	30-09.822N	141-35.326E	
XCP 04	2008/11/9	11:12:30	30-07.126N	141-35.900E	
XCTD 04	2008/11/9	11:13:49	30-07.094N	141-35.889E	
XCP 05	2008/11/9	12:07:29	30-04.465N	141-36.412E	
XCTD 05	2008/11/9	12:08:59	30-04.450N	141-36.411E	
XCP 06	2008/11/9	13:04:30	30-01.823N	141-36.980E	
XCTD 06	2008/11/9	13:06:11	30-01.809N	141-36.978E	
XCP 07	2008/11/9	13:59:17	29-59.165N	141-37.634E	
XCTD 07	2008/11/9	14:00:55	29-59.148N	141-37.622E	XCTD's depth increased unusually slowly below 1850 m.
XCP 08	2008/11/9	15:01:14	29-56.530N	141-38.199E	
XCTD 08	2008/11/9	15:02:58	29-56.515N	141-38.193E	
XCP 09	2008/11/9	15:51:52	29-54.006N	141-38.644E	
XCTD 09	2008/11/9	15:53:36	29-53.977N	141-38.655E	
XCP 10	2008/11/9	16:49:02	29-51.288N	141-39.204E	
XCTD 10	2008/11/9	16:50:40	29-51.264N	141-39.214E	
XCP 11	2008/11/9	17:45:04	29-48.445N	141-39.746E	
XCTD 11	2008/11/9	17:46:40	29-48.417N	141-39.749E	
XCP 12	2008/11/9	18:36:31	29-46.137N	141-40.219E	
XCTD 12	2008/11/9	18:38:00	29-46.095N	141-40.229E	
XCP 13	2008/11/9	19:24:08	29-43.751N	141-40.721E	
XCTD 13	2008/11/9	19:25:35	29-43.710N	141-40.727E	
XCP 14	2008/11/9	20:18:02	29-41.114N	141-41.287E	
XCTD 14	2008/11/9	20:19:36	29-41.076N	141-41.296E	
XCP 15	2008/11/9	21:12:42	29-38.012N	141-41.826E	
XCTD 15	2008/11/9	21:15:22	29-37.914N	141-41.826E	
XCP 16	2008/11/9	21:57:36	29-35.627N	141-42.259E	
XCTD 16	2008/11/9	21:59:21	29-35.576N	141-42.286E	
XCP 17	2008/11/9	22:44:40	29-33.035N	141-42.827E	
XCTD 17	2008/11/9	22:46:55	29-32.965N	141-42.841E	
XCP 18	2008/11/9	23:30:00	29-30.502N	141-43.200E	Bad XCP data, no XCTD s
XCP 19	2008/11/10	0:11:25	29-28.191N	141-43.826E	
XCTD 18	2008/11/10	0:13:18	29-28.119N	141-43.834E	
XCP 20	2008/11/10	0:37:23	29-26.726N	141-44.158E	
XCTD 19	2008/11/10	0:39:26	29-26.656N	141-44.175E	

4 . Notice on using:

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