



R/V Kaiyo Cruise Report

KY09-10

Intra-oceanic arc volcanoes and growth of continental crust:
mantle imaging in Izu-Bonin arc

December 16–28, 2009

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

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1. Cruise Information :

(1) Cruise number, Ship name: KY09-10, R/V Kaiyo

(2) Title of the cruise: FY2009 Deep sea research (R/V Kaiyo)

(3) Title of proposal:

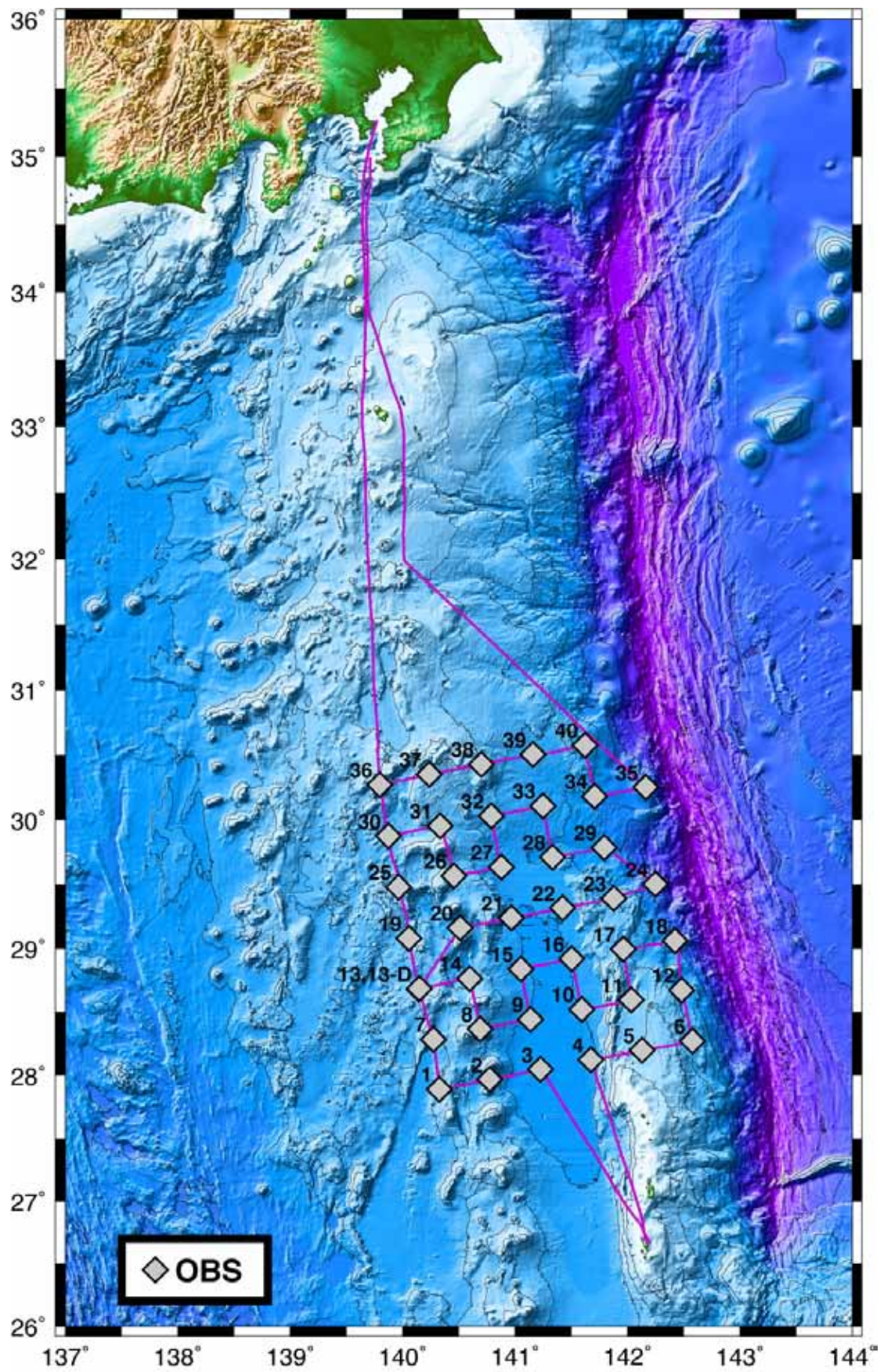
S09-20: Intra-oceanic arc volcanoes and growth of continental crust: mantle imaging
in Izu-Bonin arc

(4) Cruise period, Port call:

2009/12/16-12/28, from JAMSTEC (Yokosuka) to Yokohama

(5) Research Area: Southern Izu-Bonin arc

(6) Research Area Map:



2. Researchers

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

(2) Representative of Science Party [Affiliation]: Shuichi Kodaira [JAMSTEC]

(3) Science party list:

Shuichi Kodaira [JAMSTEC]

Narumi Takahashi [JAMSTEC]

Tsutomu Takahashi [JAMSTEC] (on-board)

Yoshihiko Tamura [JAMSTEC]

Koichiro Obana [JAMSTEC] (on-board)

Yoshio Fukao [JAMSTEC]

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3. Overview of Observation:

(1) Objectives:

Recent active seismic surveys have revealed several new seismological constraints on crustal evolution of Izu-Bonin intra-oceanic island arc. One of the important findings is a difference in crustal thickness between northern and southern parts of the Izu-Bonin arc. The Izu-Bonin arc has thicker mature crust in north of the Sofu-gan Tectonic Line (STL) than that in south of STL. Mantle wedge structure is a key to understand whether the variation in crustal thickness is caused by difference in quantity of material supply from the mantle wedge or difference in arc evolution history. The objective of this study is to compare the mantle wedge structure in southern Izu-Bonin arc and that in northern Izu-Bonin arc obtained by the OBS experiments in 2006. During the cruise, we deployed ocean bottom seismographs (OBS) in southern Izu-Bonin arc to obtain the mantle wedge structure by a seismic tomography using natural earthquakes.

(2) Observations:

1) Ocean bottom seismograph (OBS) recovery

Forty short-period OBSs (site 1-40) and one OBS with differential pressure gauge (site 13-D), which were deployed in southern Izu-Bonin arc by R/V Kaiyo in September 2009, have been recovered.

2) Others

Bathymetry data have been recorded during the OBS deployment.

(3) Cruise log:

Date		Remarks
2009/12/16	Wed	Departure from Yokosuka (JAMSTEC) Transit to survey area
2009/12/17	Thu	OBS recovery (site 13, 19, 25)
2009/12/18	Fri	OBS recovery (site 1, 2, 3, 7) Transit to Haha-jima to escape from bad sea condition
2009/12/19	Sat	Stay at Haha-jima
2009/12/20	Sun	Stay at Haha-jima
2009/12/21	Mon	Stay at Haha-jima
2009/12/22	Tue	Transit to survey area OBS recovery (site 4–6)
2009/12/23	Wed	OBS recovery (site 10–12, 15–18)
2009/12/24	Thu	OBS recovery (site 8, 9, 13-D, 14, 20–22)
2009/12/25	Fri	OBS recovery (site 23, 24, 26–29, 32, 33)
2009/12/26	Sat	OBS recovery (site 30, 31, 34, 36–40)

2009/12/27	Sun	OBS recovery (site 35) Transit to Yokohama
2009/12/28	Mon	Arrival at Yokohama

(3) OBS list:

Site	Latitude (N)		Longitude (E)		Depth (m)	Remarks
1	27°	53.301'	140°	19.663'	3056.6	
2	27°	57.983'	140°	46.537'	3293.9	
3	28°	2.727'	141°	13.510'	4148.1	
4	28°	7.319'	141°	40.567'	4071.7	
5	28°	11.781'	142°	7.722'	2012.6	
6	28°	16.187'	142°	34.800'	2838.0	
7	28°	16.947'	140°	16.532'	3282.8	
8	28°	21.903'	140°	41.252'	2420.5	
9	28°	26.500'	141°	8.328'	4062.4	
10	28°	31.091'	141°	35.586'	4024.6	
11	28°	35.561'	142°	2.060'	2605.5	
12	28°	40.196'	142°	29.059'	4005.2	
13	28°	40.794'	140°	8.760'	2570.7	
13-D	28°	40.911'	140°	8.825'	2552.0	OBS with DPG, vessel position at deployment
14	28°	45.714'	140°	35.700'	3765.4	
15	28°	50.231'	141°	3.162'	3906.7	
16	28°	54.973'	141°	30.384'	3988.0	
17	28°	59.443'	141°	57.714'	2500.0	
18	29°	3.525'	142°	25.439'	4950.5	
19	29°	4.676'	140°	3.442'	2519.5	
20	29°	9.462'	140°	30.790'	3288.0	
21	29°	14.098'	140°	58.160'	4002.3	
22	29°	18.760'	141°	25.317'	3970.7	
23	29°	23.258'	141°	52.700'	3226.9	
24	29°	29.874'	142°	15.004'	5483.6	
25	29°	28.540'	139°	57.880'	2383.9	
26	29°	33.879'	140°	27.448'	2738.5	
27	29°	37.985'	140°	52.710'	3727.4	
28	29°	42.511'	141°	20.087'	3994.9	

29	29°	47.000'	141°	47.528'	4608.6	
30	29°	52.401'	139°	52.424'	2719.7	
31	29°	57.164'	140°	19.906'	2282.1	
32	30°	1.799'	140°	47.308'	3187.3	
33	30°	6.405'	141°	14.905'	3623.5	
34	30°	10.869'	141°	42.569'	4168.1	
35	30°	14.990'	142°	9.824'	4408.5	
36	30°	16.265'	139°	47.907'	1944.9	
37	30°	20.958'	140°	14.367'	1489.6	
38	30°	25.674'	140°	41.988'	1615.8	
39	30°	30.217'	141°	9.645'	3253.8	
40	30°	34.479'	141°	37.458'	3444.1	

All OBS positions except for site 13-D were determined by the SSBL on R/V Kaiyo during KY09-08 cruise in September 2009.

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.