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R/V Kaiyo Cruise Report

KY09-08 Leg1

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

September 17–28, 2009

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

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１． Cruise Information：

（1）Cruise number, Ship name: KY09-08 Leg1, R/V Kaiyo

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

（3）Title of proposal:

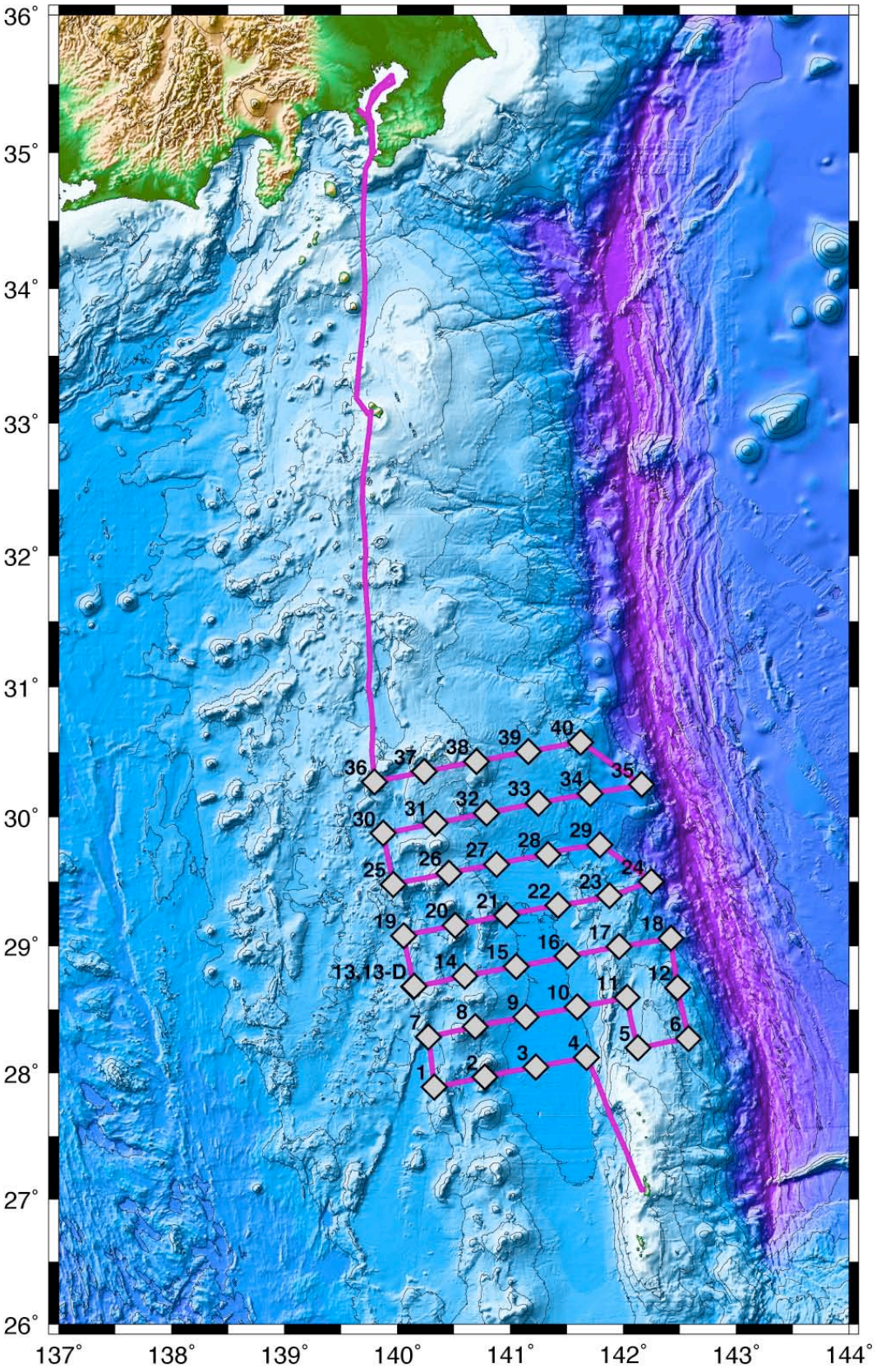
S09-20: Intra-oceanic arc volcanoes and growth of continental crust: mantle imaging in Izu-Bonin arc

（4）Cruise period, Port call:

2009/9/17-9/28, from JAMSTEC (Yokosuka) to Futami, Chichi-jima

（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]
Zhi Wang [JAMSTEC]

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) deployement

Forty short-period OBSs (site 1–40) and one OBS with differential pressure gauge (DPG) (site 13-D) have been deployed in southern Izu-Bonin arc.

2) Others

Bathymetry data have been recorded during the OBS deployment.

(3) Cruise log:

Date		Remarks
2009/9/17	Thu	Departure from Yokosuka (JAMSTEC) Transit to Tateyama Bay to escape from typhoon
2009/9/18	Fri	Transit to Tokyo Bay to escape from typhoon
2009/9/19	Sat	Stay in Tokyo Bay to escape from typhoon
2009/9/20	Sun	Transit to Tateyama Bay
2009/9/21	Mon	Transit to survey area
2009/9/22	Tue	OBS deployment (site 35–40)
2009/9/23	Wed	OBS deployment (site 25, 26, 30–34)
2009/9/24	Thu	OBS deployment (site 22–24, 27–29)
2009/9/25	Fri	OBS deployment (site 13-D, 13–16, 19–21)
2009/9/26	Sat	OBS deployment (site5, 6, 10–12, 17, 18)
2009/9/27	Sun	OBS deployment（site 1–4, 7–9) Transit to Chichi-jima
2009/9/28	Mon	Arrival at Futami, Chichi-jima

(4) 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.

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.