YK13-01 YOKOSUKA Cruise Summary

1. Cruise Information

Cruise ID: YK13-01
Name of vessel: YOKOSUKA
Title of the cruise: Seafloor spreading dynamics near the Rodriguez Triple Junction: from mantle to hydrothermal activity, part 1
Cruise period: Jan.16 - Feb.4, 2013
Ports of call: Singapore - Port Louis
Research area: Rodriguez Triple Junction, Indian Ocean
Participants:

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Kyoko Okino[6], Toshinori Sato[5], Masanao Shinohara[2], Yoshifumi Nogi[3], Kimihiro Mochizuki[2], Takeshi Tsuji[7] (Scientists on land)
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2. Overview of the Observation

We successfully deployed sixteen OBEMs (Ocean Bottom Electro-Magnetometer), eighteen OBSs (Ocean Bottom Seismometer), one OBSP (Ocean Bottom Seismometer with Pressure gauge), and two OBSMs (Ocean Bottom Seismometers with Magnetometer) across the central and southeast Indian Ridges near the Rodriguez Triple Junction and near the "Kairei" hydrothermal vent site in the first segment of the central Indian Ridge (Table 1 and Figure 1). We started our observation at the ocean bottom; the measurement of magnetic and electric field variations by the OBEMs and OBSMs and seismic observation by the OBSs including the OBSP and OBSMs. The observation continues up to the recovery of these instruments during another Yokosuka cruise in this March. We also conducted active seismic surveys to investigate seismic velocity structure using the OBSs, an air-gun, and a single channel hydrophone streamer (Figure 2). Further, we conducted surface geophysical survey to collect multi-narrow beam bathymetry, magnetic field, and gravity field data mainly during night and transit times, which cover total 360 miles in the research area (Figure 3). The observed data will be analyzed to derive upper mantle structure, crustal structure, hypocenter distribution, and tectonic history, which will provide important constraint on geodynamics of this seafloor-spreading system together with hydrothermal activities. Moreover, we checked the TRITON buoy No.18 that has been missing since 3 Dec. 2012, and we found that only the acoustic releaser near sea-bottom exists and that the surface buoy was probably lost.

Site	Location				
	Latitude (S)		Longitude (E)		Depth (m)
	Deg.	Min.	Deg.	Min.	
EM1	25	08.28	71	01.63	3412

EM2	25	17.51	70	44.93	3556
EM3	25	29.01	70	38.42	3071
EM4	25	39.01	70	26.45	3160
EM5	25	46.00	70	17.47	2805
EM6	25	49.03	70	13.96	3640
EM7	25	52.04	70	09.95	3011
EM8	25	58.54	70	01.46	3256
EM9	26	08.02	69	49.98	3335
EM10	26	18.02	69	37.46	3687
EM11	25	16.48	70	24.03	2008
EM12	25	17.97	70	14.53	2952
EM13	25	22.48	69	55.55	3246
EM14	25	24.42	69	45.66	2787
EM15	25	26.46	69	29.07	2857
EM16	25	28.48	69	13.05	2829
S1	25	16.12	69	53.97	4157
S2	25	19.28	69	56.21	4072
S3	25	22.51	69	58.36	4035
S4	25	22.41	70	02.56	3110
S5	25	19.17	70	00.44	2972
S6	25	16.02	69	58.19	3862
S7	25	12.80	69	56.05	3912
S8	25	09.49	69	58.04	3167
S9	25	12.71	70	00.24	3073
S10P1	25	15.92	70	02.37	2726
S11	25	19.07	70	04.64	2893
S12	25	22.30	70	06.75	2729
S13M2	25	18.97	70	08.83	2924
S14	25	15.77	70	06.64	3293
S15	25	12.60	70	04.44	3219
S16	25	09.40	70	02.24	3788
S20	25	12.51	70	08.64	4314
S21	25	15.70	70	10.83	3213
S31	25	18.39	70	01.83	2425
S32	25	19.99	70	01.83	2827
S33M1	25	19.12	70	03.24	2325

Table 1. Deployment location of ocean bottom instruments. EM: OBEM, S: OBS, P: pressure gauge attached to OBS, M: magnetometer attached to OBS.

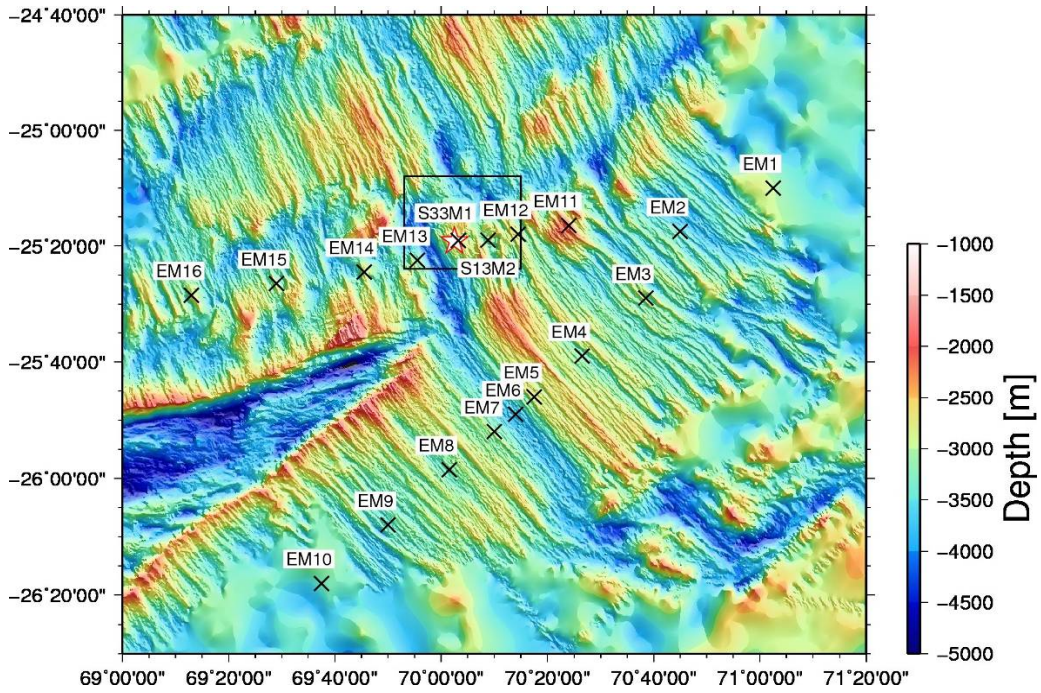

Figure 1a. Location map of OBEMs and OBSMs (crosses). White star bounded with red line indicates the location of the Kairei hydrothermal vent site. The solid rectangle shows the range of Figure 1b.

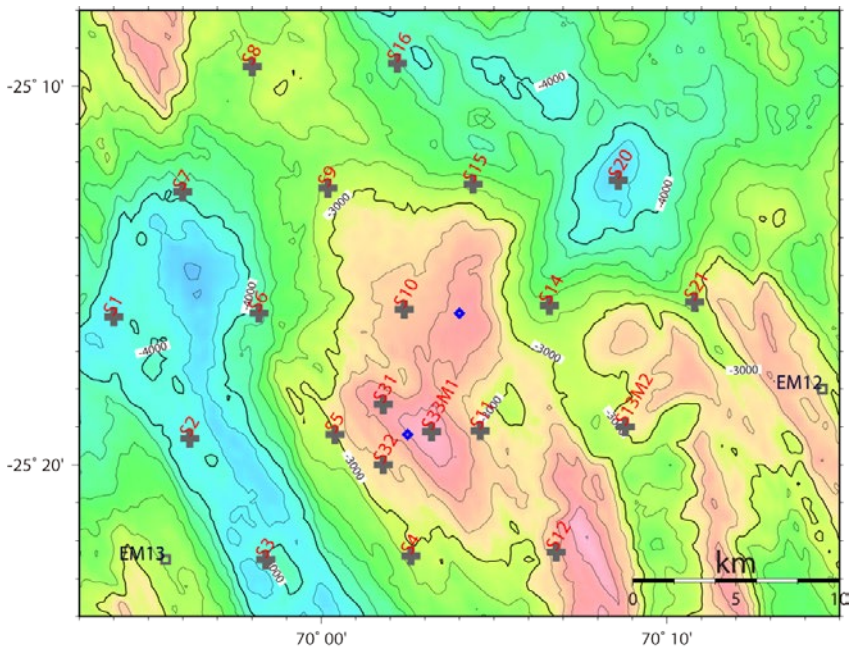

Figure 1b. Location map of OBEMs (squares) and OBSs (crosses) including OBSP (S10), and OBSMs (S13M2 and S33M1) around the Kairei hydrothermal vent (left blue diamond). Right blue diamond shows the location of the top of the Yokoniwa Rise.

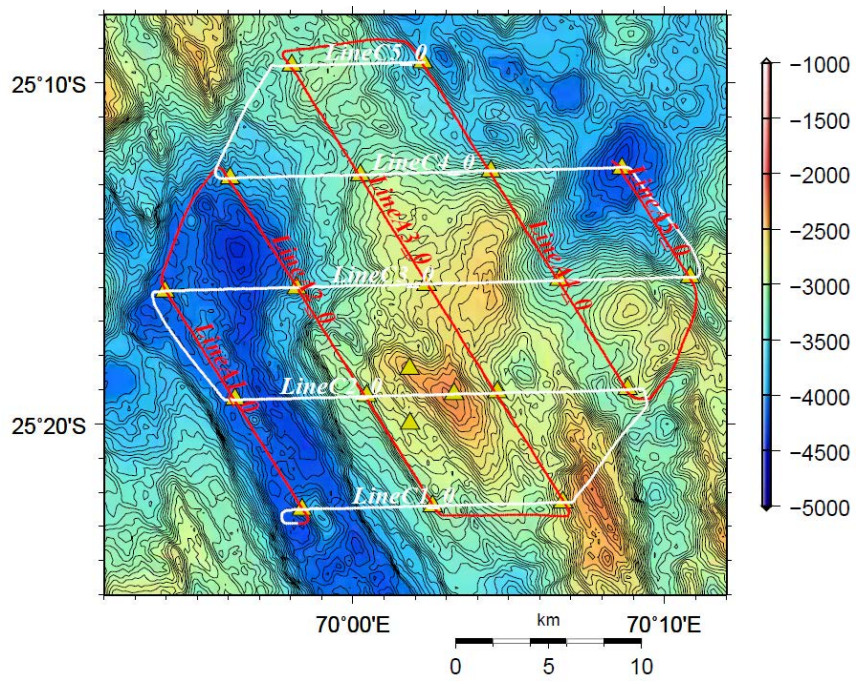

Figure 2. Location map of OBSs (triangles) and seismic reflection and refraction survey lines.

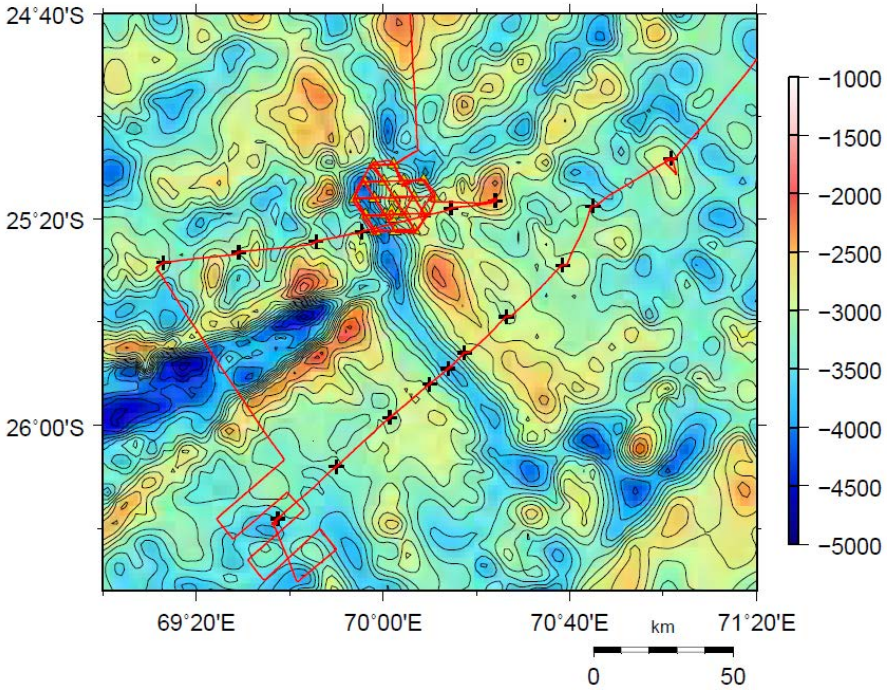

Figure 3. Ship tracks in the research area

Acknowledgement

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