Japan Geoscience Union Meeting 2010
(May 23-28 2010 at Makuhari, Chiba, Japan)

SCG086-20 会場:ファンクションルームB 時間: 5月26日09:15-09:30

南西インド洋海嶺34-40Eの超低速拡大セグメントの地球物理学的研究（KH0704-Leg2 and KH0905-Leg4）

Geophysical study of ultra-slow spreading segment at Southwest Indian Ridge 34-40E (KH0704-Leg2 and KH0905-Leg4)

佐藤 太一[1*], 沖野 郷子[1], 島 伸和[2], 羽入 朋子[4], 水野 真理子[3], 小嶋 孝徳[1], 奥村 智[5]

Taichi Sato[1*], Kyoko Okino[1], Nobukazu Seama[2], Tomoko Hanyu[4], Mariko Mizuno[3], Takanori Ojima[1], Satoshi Okumura[5]

[1]東京大学海洋研究所, [2]神戸大学内海域環境教育研究センター, [3]千葉大学大学院自然科学研究科, [4]総合研究大学院大学極域科学専攻, [5]グローバルオーシャンディベロップメント

[1]Ocean Research Institute, Univ. of Tokyo, [2]Research Center for Inland Seas, Kobe U, [3]Graduate school of science, Chiba Univ., [4]School of Multidisciplinary Sciences, [5]Global Ocean Development Inc.

Variability of mid-ocean ridge is considered to be controlled by the balance between its spreading rate and melt supply. Moreover, when a hotspot is located near enough to a mid-ocean ridge, the interaction of two volcanic systems may result unique features. We conducted the surface geophysical survey (topography, magnetics and gravity) at Southwest Indian Ridge 34-40 E (full spreading rate ~18mm/yr, ultraslow), where the Marion hotspot may affect ridge process, during R/V Hakuho-Maru KH0704-Leg2 in January 2008 and KH0905-Leg4 cruise in January 2010. Southwest Indian Ridge 34-40 E is located between Prince Edward fracture zone and Eric Simpson fracture zone. This segment consists of four subsegments perpendicular to the spreading direction. These orthogonal subsegments are connected by oblique spreading segments or non-transform discontinuity. The off-axis areas up to 6 Ma were covered by our survey.
The western subsegment (35:30-36:30 E) extends 70 km along the axis and is characterized by the narrow axial valley and well developed ridge parallel off-axis abyssal hills. A V-shaped array of topographic highs can be seen from the spreading axis to the off-axis. The thicker crust (~ 9 km) is estimated at the tip of this structure using gravity data. Many conical knolls are discovered around the tip of the V-shaped high.
East of the western subsegment, an oblique subsegment (36:30-37:06 E) shows a very deep trough about ~3500 m and its off-axis morphology is asymmetric and irregular. The direction of this subsegment is N65 E and its spreading direction is N15 E, thus the obliquity is 40 degree. Sporadic volcanic structures can be seen at the ends and the center of the subsegment but they are not clear at the latter place. Off-axis area show highly asymmetric and irregular morphology; the northern area is characterized by its blocky and smooth seafloor and the southern area is hillock, that is quite different from adjacent off-axis morphology. The oblique subsegment and the western subsegment are connected very continuously, so clear segment boundary could not be recognized.
The central (37:06-37:45 E) subsegment appears as a typical active slow-spreading axis with axial valley of depth between 2500-3000 m and axial volcanic zone is identified within the axial valley. Well-organized, nearly symmetric abyssal hills with relatively large topographic relief are also seen at both sides of off-axis areas. Extremely shallow depth (350 m) is observed at the southern ridge flank.
A small scale subsegment (37:45-38:07 E) extends 20 km along the axis east of central subsegment. The subsegment is bounded by non-transform discontinuity at both ends. The offset

is 20 km at its western end and 30 km at its eastern end, respectively. The eastern non-transform discontinuity is broader and deeper than the western side. Nearly symmetric abyssal hills also are seen at both sides of off-axis area of this subsegment but its spacing is wider than that of the western and central subsegment.
The eastern subsegment (38:20-39:00 E) has well developed abyssal hill and the seafloor depth is shallower than that in the central subsegment but has no extreme shallow topography, although our survey only covers the area near the axial valley.
Our previous analysis of geophysical data obtained during KH0704-Leg2 cruise indicates that the central and western subsegment show melt-focused features and oblique subsegment show less-magmatic characteristics, but the relationship among these subsegments and their evolution process were remained unsolved. By adding the data obtained during KH0905-Leg4 cruise, we can tackle with the issue of magmatic/tectonic activity under ultraslow spreading setting. Moreover, we will combine our geophysical data with the result of seismic, electro-magmatic and petrological studies done in the same area to discuss the possibility of hotspot-ridge interaction.

キーワード:中央海嶺,海底地形,地磁気縞異常,重力異常

Keywords: mid-ocean ridge, seafloor morphology, magnetic anomaly, gravity anomaly