

Preliminary report of surface geophysical survey at Southwest Indian Ridge 34-40E cruise (KH0704-Leg2)

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Variability of mid-ocean ridge is considered to be controlled by the balance between spreading rates 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 surface geophysical survey (topography, magnetics and gravity) at Southwest Indian Ridge 34-40E (full spreading rate ~ 15 mm/yr, ultraslow), where the Marion hotspot interacts ridge process, during *R/V Hakuho-Maru* KH0704-Leg2 cruise on January, 2008.

Southwest Indian Ridge 34-40E is located between Prince Edward fracture zone and Eric Simpson fracture zone and is characterized with deep axial valleys. This segment consists of three subsegments perpendicular to the spreading direction and two axial deeps which extend oblique to spreading direction connecting adjacent orthogonal subsegments. Surface surveys were focused on half of western subsegment (35 30-36 20 E), part of central subsegment (37 15 -37 35 E) and the topographic deep (36 35 -37 15 E) between western and central subsegments. The off-axis areas up to 5 Ma were also covered for these areas.

The central subsegment appears as a typical active slow-spreading axis with axial valley of depth between 2500-3000 m and axial volcanic zone are identified within the axial valley. Well-organized, nearly symmetric abyssal hills with relatively large topographic relief also could be seen at both sides of off-axis areas. The western subsegment is characterized narrow axial valley and well developed ridge parallel off-axis abyssal hills. A V-shaped array of topographic highs could be seen from spreading axis to the off-axis on satellite altimetry map, however, the coverage of our swath mapping was not enough to elucidate its details. The topographic deep connecting these two orthogonal ridge axes shows very deep trough about 3500 m and its off-axis morphology is asymmetric and irregular. The relief of abyssal hills is apparently large in the northern off-axis area than in the southern off-axis. Preliminary analysis of magnetic data reveals a magnetic lineation pattern which could be identified up to Anomaly 3 at central and western subsegments. But in off-axis area of the topographic deep, it is difficult to identify any magnetic lineations because of low amplitude of magnetic anomalies.

Further analysis of the dataset will provide geophysical constraints for understanding this unique segment interacted with the hot spot.