Magnetic structure of an Oceanic Core Complex at the southernmost part of the Central Indian Ridge

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We investigated the magnetic structure of an ocean core complex (OCC) in the southernmost Central Indian Ridge (full spreading rate: 50mm/yr) near 25S. The 25S OCC is located 22km western off-axis of the CIR segment2 and extends approximately 20km along the flow line and 10km across the flow line. It is a doomed topographic high with well-developed, flow line parallel corrugations on its top. Geophysical survey was carried out over the OCC, during YK05-16 cruise of R/V *Yokosuka* in January 2006.

Two types of geophysical measurements were conducted; 1) standard surface geophysical mapping which includes multibeam bathymetry mapping, surface-tow magnetometer, shipboard three-component magnetometer and 2) high-resolution vector magnetic measurement using deep sea three-component magnetometer attached to the manned submersible *Shinkai6500* . Total three submersible dives were done over the surface of the OCC and continuous magnetic profile along a corrugation was collected with video records and rock samples. We analyzed these data and obtained following results.

(1) OCC was initiated at the south western end (inside corner) of the Central Indian Ridge Segment2 (CIR-S2) during reverse polarity chron. The results of surface-tow magnetometer survey shows that the magnetization intensity over the OCC is very weak compared to the adjacent area of same age. It may suggest that the OCC consists of rocks that contain less magnetic mineral and/or the seafloor magnetization has been weakened by localized weathering and alteration.

(2) Duration time of the OCC is estimated as 0.9Myr by using a new detailed geophysical survey data. This duration time is almost similar to that of the OCCs in the Mid-Atlantic Ridge (1.0˜2.6Myr).

(3) Based on the shipboard three-component magnetometer analysis, magnetic boundary vectors are detected on the OCC. They may correspond to the small scale subchron like Gilsa (1.65Ma) and Cobb mountain (1.13Ma).

(4) Data collected by deep sea magnetometer also indicate that the magnetization of the OCC is weaker than its surroundings. Along the submersible dive tracks on the corrugated surfaced of the OCC, many gabbroic rocks were recovered. It supports the idea that the OCC mainly consists of gabbroic rocks, which show the lower (smaller) magnetization than basalts. Local high magnetization observed at the eastern scarp of the OCC (termination), where the peridotite sample was recovered, may suggest the induced magnetization by serpentinization of peridotite.

(5) Jaramillo subchron on the OCC is recognizable on the magnetization profile along the submersible track, however the signal is very weak. The existence of Jaramillo subchron on the OCC and its location suggests that the acquisition time of magnetization may be same between on and off the OCC.