Spatial and temporal variation of Igneous activity around Rodriguez Triple Junction, Indian Ocean

Hidenori Kumagai[1]; Kyoko Okino[2]; Hiroshi Sato[3]; Kiyoyuki Kisimoto[4]; Kentaro Nakamura[5]; Tomoaki Morishita[6]; Arata Yoshihara[7]; Katsuhiko Suzuki[8]; Takeshi Hanyu[9]; Keiko Sato[10]

[1] JAMSTEC; [2] ORI; [3] School Business Administration, Senshu Univ.; [4] GSJ, AIST; [5] Geosystem Eng., Univ. of Tokyo; [6] Earth Science, Kanazawa Univ.; [7] Dept. of Earth Sciences, Toyama Univ.; [8] IFREE, JAMSTEC; [9] JAMSTEC/IFREE; [10] JAMSTEC, IFREE

A suite of dive expedition is scheduled in January to February, 2006, around Rodriguez Triple Junction (RTJ), Indian Ocean. This expedition, planned as a part of an interdisciplinary study, covers microbiology, geochemistry, geology and geophysics. 15-dives are assigned, which mainly focuses on geological and geophysical survey. In the study area two remarkable topographic characters are found: a megamullion on western off of ridge axis and a huge volcanic edifice on the ridge axis. Such a megamullion is generally regarded to be an indicator of magma-poor condition. On the other hand, the huge volcanic edifice, named as Knorr Seamount, indicates large magma supply because of its negative residual mantle Bouguer anomaly.

In addition, the study area includes two hydrothermal field: Kairei and Edmond-hydrothermal field. These two hydrothermal field have very distinctive characters each other. Especially, the Kairei-Field is known as extraordinary high concentration of hydrogen in the hydrothermal solution and existence of HyperSLiME. HyperSLiME is chemolithoautotrophic ecosystem that is interpreted to be driven by hydrogen which is probably generated by hydrothermal serpentinization of ultramafic rocks at high temperatures. To investigate geological and tectonic background of the two hydrothermal field is one of the most important objectives in the expedition.

The dive targets are as follows: 1) across ridge transects for two hydrothermal sites - Kairei and Edmond, 2) Megamullion – located in western off of 1st segment of the Central Indian Ridge (CIR), 3) Knorr Seamount - a point source volcano on present day's ridge axis, these dives will be followed by along axis dive survey of CIR-RTJ ridge system. After our geological and geophysical cruise, another microbiological and geochemical cruise is also scheduled.

Proposed sample analyses are as follows: 1) magma-hydrothermalism interaction analysis by using hydrothermally altered rocks and carbonates among ultramafic rocks, 2) magma genesis of MORB – origins of Indian-type MORB and Nb-depletion, and 3) isotope geochemistry including non-traditional isotopes. Coupled with geophysical survey by submersible and mother vessel, tectonic and structural studies will also be performed.

In front of the poster, detail targets of dives and survey will be discussed.