Paleoceanographic journey through 150 Ma in the Shatsky Rise

MOE Kyaw Thu[1]

[1] JAMSTEC, IFREE

http://www.epsu.jp/jmoo2002/

Shatsky Rise, medium-sized Large Igneous Province in the western Pacific, has been the target of four DSDP and ODP legs. Again in 2001, ODP Leg 198 drilled in the area to address the causes and consequences of Cretaceous and Paleogene global warmth or 'greenhouse' climate as well as abrupt climatic events. Totally eight sites were drilled during the two months long leg, one site each on the Northern and Central Highs and six sites on the Southern High, on a broad depth transect designed to characterize changes in the nature of surface and deep waters through time, including vertical gradients of temperature, oxygenation, and corrosiveness. Achievements include virtually complete section from the Recent to the Jurassic/Cretaceous boundary interval, first ever basement rocks, and 3 big records, recovering 9 times of Cretaceous/Tertiary (K/T) boundary (previous total of 12), 10 times of late Paleocene events (previous total of 8), and 3 times of early Aptian black shale (previous total of 4).

As a team member of the downhole logging operations, onboard logging data processing and interpretation helped the scientific party not only in defining logging units but also finding nature and distribution of the chert layers and calculation of total organic carbon (TOC) content of early Aptian black shale. Regarding the chert layers, fundamental part of Cretaceous stratigraphy in this area and poorly recovered on cores, Formation MicroScanner logs successfully imaged at Site 1207, and identified previously little-known of its distribution and nature. These logs clarified layered occurrence of chert rather than nodules, and having variable thickness and spacing through the stratigraphic column. Moreover, pronounced highs in gamma-ray and Uranium values clearly point out exact depth range and thickness of the early Aptian black shales recovered at Sites 1207 and 1213, and density logs were used to calculate TOC content of the shale.

Post-cruise research is continuing on high-resolution stratigraphy of the area based on core-log-seismic data integration method. Characterization of the logging data sets from the Northern High will help to understand the formation and occurrence of the chert in the region, at least in local scale. For regional scale correlation, paleoceanographic events, which are distinct on core and physical properties results, are to be traced on seismic profiles through integration of very high-resolution seismic and logging data. Results from this work will fill the Pacific gap in current paleoenvironmental data sets to complete global reconstructions and modeling of the physical and chemical parameters of warm waters.