Cruise summary

1． Cruise Information：

（1） Cruise number, Ship name: KR10-05, R/V Kairei

（2） Title of the cruise: 2009FY Deep Sea Research cruise

（3） Chief Scientist [Affiliation]: Seiichi MIURA [JAMSTEC]

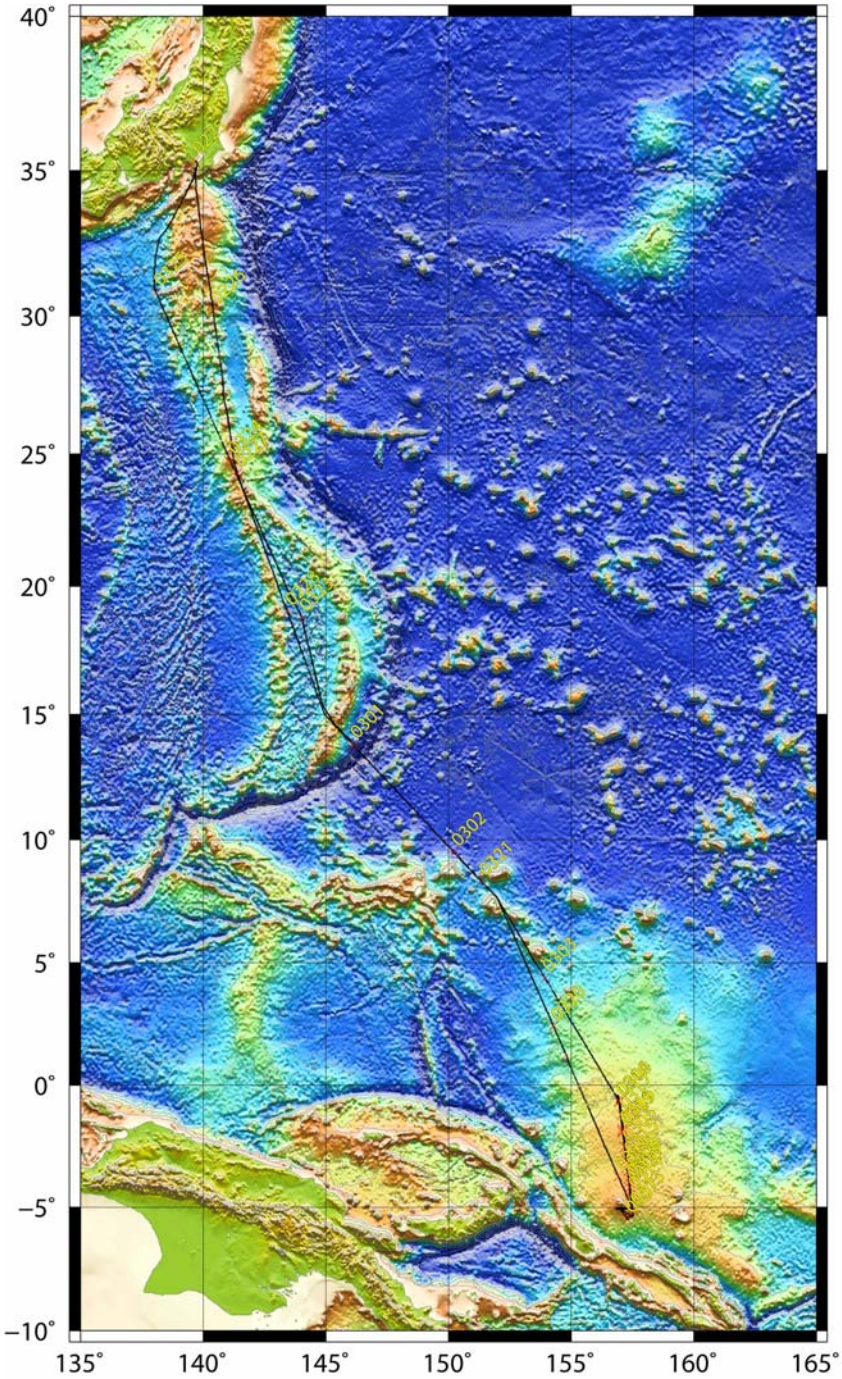
（4） Representative of Science Party [Affiliation]: Yoshio Fukao [JAMSTEC]

（5） Title of proposal: High resolution deep seismic study in the Ontong Java Plateau

（6） Cruise period, Port call: 2010/2/25-3/26, Yokosuka to Yokosuka

（7） Research Area: Ontong Java area, southwest Pacific.

（8） Research Map:



２．Overview of　Observation：

（１）Objectives：

There are many thick crustal portions on the earth, which is called as large igneous provinces (LIPs). Typical examples of the LIPs are the Deccan Traps, the North Atlantic Margin, and the Kerguelen and the Ontong Java Plateaus. The Ontong Java Plateau (OJP) is the largest LIPs. The formation of the LIPs is thought to be geologically short periods. Depositions of black shale have been discovered from the strata of ages of LIPs formations, which suggests the existence of global anoxic sea conditions. Therefore, LIPs formation have affected not only to solid earth but also to environmental impact as atmosphere and hydrosphere. LIPs is one of important targets of Integrated Ocean Drilling Program (IODP).

The formation mechanism of the LIPs is not reached to the general consensus among several models: plume head origin, meteorite impact, and unusual upper mantle, none of them can explain perfectly to the observational data. One of the reasons not to reach consensus is insufficient to reveal detailed crustal and uppermost mantle structure of the OJP. We reveal the detailed structure from crust to uppermost mantle using seismic data of ocean bottom seismometers (OBS) and multi-channel seismic reflection system (MCS).

（２）List of observation instruments：

１）Deployment of OBS

At first, we deployed one hundred OBS with 5-km interval.

２）Seismic survey for MCS and OBS

We deployed a tuned airgun array of 7800 cu. in. and 444-ch hydrophone streamer with 12.5-m group interval Shooting intervals for OBS and MCS were respectively 200-m and 50-m. Towing depths of airgun array and streamer are 10-m and 21-m, respectively.

３）Retrieval of OBS

After the shootings, one hundred OBS were retrieved.

４）XBT

To correct the sound speed of seawater for bathymetric mapping, nine XBT were deployed.

５）Bathymetry, magnetics and gravity observation

During the cruise, bathymetry, magnetics and gravity data have been recorded continuously by SEABEAM2112.004, three component magnetometer and gravity meter, respectively.