Heat flow distribution in the Nankai Trough: Recent resultsfrom KY02-02 cruise and future strategy

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The KY02-02 cruise was carried out from Feb. 4-13, 2002, in the Nankai Trough region off Kumano, using R/V KAIKO of JAMSTEC. This cruise was designed as one of the series of cruises dedicated to understand geophysical, geological and geochemical structure and evolution of the Nankai accretionary and seismogenic system.

On the trough floor, one piston core samples with heat flow data was obtained. The heat flow was ca. 110 mW/m^2, similar to values obtained previously in the nearby stations. Yamano et al. (2000) pointed out that the heat flow along the floor of the Nankai Trough is anomously high in the western part, whereas it is low in the eastern part. The cause for this anomaly is still unknown, with an implication of channelized fluid seepage along the decollement. It is very important to know the eastward limit of high heat flow anomaly, and continuous surveys are planned in the FY2002.

Many mud volcanoes have been identified in the Kumano Basin. We conducted an intensive survey at two of them, temporarily designated as MV-B (33_41.015N, 136_33.427E, 1933m). Two piston core samples were taken on its summit. Five heat flow data were obtained on the EW transect across the mound. All the heat flow data were lower then 45 mW/m^2, although the effect of bottom-water temperature variations has to be considered carefully, using a long-term heat flow data obtained near MV-B by Yamano. If these heat flow values represent the thermal regime of MV-B, we could either conclude that MV-B is no more active, or that it is active but the fluid from deeper part is not warm at all. A comparative study is important for further interpretation of the result.

In 2002, we plan a series of research cruises in the Nankai Trough region, starting from this cruise (KY02-02). They involve submersible survey and ROV surveys, as well as surface ship surveys. A good cooperation among cruises and among scientists is essential.