

Forward Looking Sonar imagery of Fryer site, south Mariana Trough

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The investigation of the active vents area of central ridge, south end of Mariana Trough is done vigorously this year. 4 short drillings were performed at 2 sites in this area January this year using BMR of No.2 Hakurei-maru, Japan. Generally submarine hydro-thermal activities start after the magmatic activity, the flux of the hydro-thermal flow changes violently in 1-2 years, and it is considering having the final breath at several years. At the time of drilling temperature of an active vent was reported to be decreasing from 120 C of last year to 70 C January this year.

Many diving investigations were done and many images such as video are left. The precision of acoustic positioning, particularly in case of SSBL, is not so good, and it is uncertain in the position relations of each diving tracks. Long Base Line Acoustic positioning system (LBL) produces better quality of positions but not yet satisfactory ones. We need continuous and accurate (less than 1m) positions for better image of sea floor.

A compact and low-price side-scan-sonar (Sportscan) is remodeled into deep sea type in the research cruise, TN167, of ROPOS (Thomas G. Thompson), The Canadian Scientific Submersible Facility. It was installed on ROPOS in a anti-pressure case to record the side-scan-sonar data in off-line mode. The diving of ROPOS, #777 for side-scan-sonar survey was performed in 23rd Mar. 2004.

ROPOS was able to maintain the height of 3-5m from the sea-bottom, but sometimes went up to 10m or more, range 30m (both sides 60m) and line interval 50m, and several survey lines were successfully investigated. We can see the rocks of 1 to several m in size at the sea-floor, probably most of them were pillow lava flows. Mesotech 971 scanning, color imaging sonar, modified with a lower frequency and narrow-beam head for enhanced long range response was used for forward looking sonar and its record was saved digitally. We were able to process the data and image of forward sea floor was plotted on map.

ROV could not run at a stable speed and direction. Probable cause is that the ROV is hung by launcher with a cable, and launcher is also by a ship. Obviously agitation on the sea is conveyed even in monitor screen sometimes. It seems that because there was no problem in the ability of ROV which works still at the sea bottom, the problem of the positioning precision wasn't raised very much so far. We hope for the accurate recording of ROV's speed against the bottom, resulting in the improvement of the positioning.