

Sub-bottom profiling and side-scan-sonar record during KAIKO700II/KR08-13 cruise in the NANKAI TROUGH

Masato Joshima[1]; Masataka Kinoshita[2]; Takafumi Kasaya[2]; yoshifumi kawada[3]; Kiyokazu Nishimura[4]; Kiyoyuki Kisimoto[5]

[1] IGG,GSJ,AIST; [2] JAMSTEC; [3] JAMSTEC-IFREE; [4] IGG, AIST; [5] GSJ, AIST

Side-scan-sonar (SSS) is a tool to create 2-dimensional imagery of the seafloor, and sub-bottom-profiler (SBP) is used to make a cross sectional (vertical) structure of the sedimentary layers beneath the seafloor. These two instruments were combined and integrated into a compact (portable) package system (off-line system) to accommodate into various vehicles. We named the system 'DAI-PACK: Deep-sea Acoustic Imaging Package'. In former cruise, KR-6-10, only sub-bottom profiler was attached to KAIKO7000II and some data was obtained, but 2 dives could not continue to run so much due to KAIKO' black-out.

During the cruise KR08-13, sub-bottom profiling function of the DAI-PACK was mainly used and side-scan-sonar function was tested in the last dive. We have successfully recovered the SBP data from both dives; KAIKO-dive#438 on Oct. 09th and dive#439 on Oct. 11th, and SSS data from dive#439.

Preliminary result

KAIKO's operational main target is to come back to the ODP drilling stations with the A-CORK system and to recover the long-term geophysical data records.

Setting for DC gain is 22db, BT gain is 0db, shift range is 0m, and range is 20m. Fairly good sub-bottom records were obtained for about 80 and 60 minutes, for the two dives, respectively. During the dive the KAIKO covered the distances of 370m for dive#438, 360m for dive#439. Some profiles were produced after the computer-intensive processing.

In dive#439, SSS transducer was set at rather higher part for the safety, so right side has 2 bands of shadow by basket and right arm.

KAIKO has useful forward-looking sonar whose working angle is rather narrow from horizontal plane comparing SSS sonar. During the measurements of HF survey KAIKO ceased its movement and produce excellent sonar images.

Accuracy of SSBL acoustic positioning system is insufficient for seafloor image mapping.

Bottom-lock speed sensor (Doppler sonar), which is common in AUV (automated underwater vehicle), is necessary for better positioning of ROV (remotely operated vehicle) or submersible.