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FY2014 AUV survey in shallow methane hydrate fields in Japan Sea

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As a part of national project of shallow methane hydrate exploration, high-resolution acoustic survey (SK14 cruise) using an autonomous underwater vehicle (AUV) was performed in offshore areas of Oki, Joetsu, and Mogami Trough from May 10th through June 3rd in 2014. The survey was carried out basically in the same manner as that of SK13 cruise. We used AUV 'Deep1' and the mother vessel 'Shinkai-maru (329 t)' (both are from Fukada Salvage & Marine Works Co., Ltd.). The Deep1 is installed three acoustic observation equipment, a multi-beam echo sounder (MBES), a sub-bottom profiler (SBP) and a side-scan sonar (SSS), and its battery can make the vehicle perform over 20 hours dives. An ultra-short base line (USBL) system was taken for navigation. For the surveys, we applied normal mode taking line interval of 150 m and precise mode taking that of 10m. The vehicle keeps altitude above the seafloor at 50 m for the normal mode and 25 m for the precise mode. The targets of the survey were chosen from some topographical anomaly points, called mounds and pockmarks, which had been identified by the previously performed wide area surveys (7K13 and 7K14 cruises). The AUV were able to clarify detailed topography and shallow geologic structures in the mounds, pockmarks and the surroundings and grasped characteristic features and the variations of acoustic blanks, high reflection layers, seafloor high reflections and so on.

Keywords: Methane hydrate, AUV, multi-beam echo sounder, SBP, sub-bottom profile, side-scan sonar