

Preliminary report on the experiment to verify the precision and performance of multibeam echo-sounder using a water tank

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With the spread of high-resolution multibeam echo-sounder (MBES), there has been a growing interest in precision and performance of MBES which is not listed in the catalog specifications, in order to use MBES correctly and obtain high-quality sounding data. In order to accurately understand precision and performance of MBES, it is necessary to conduct experiments in a controlled environment, such as a water tank. However, the experimental method of MBES using a water tank has not yet been established. In this presentation, we will report on our experimental methodology and initial results of the water tank experiment attempted to measure the complex nature of precision and performance of MBES.

The experiment was conducted in the ocean engineering tank at the Institute of Industrial Science, the University of Tokyo. The tank space precisely measured by the total stations to verify the accuracy. The layout of the equipment in the tank (50 m×10 m×5 m) is shown in Fig. 1. The target (1 m squared) was placed in the tank, and MBES was attached on the turntable of the moving platform. The positions of target, MBES, and tank corners were precisely measured by the total stations to compare MBES sounding data. The sound speed profiles in the tank were observed at 12 points.

By moving the platform from east to west, the distance dependence of the precision and performance of MBES was investigated. In addition, the turntable was rotated to investigate the angular dependence of the precision and performance of MBES. An example of the MBES data obtained from this experiment is shown in Fig. 2. The detailed experimental results and interpretations will be reported in this presentation.

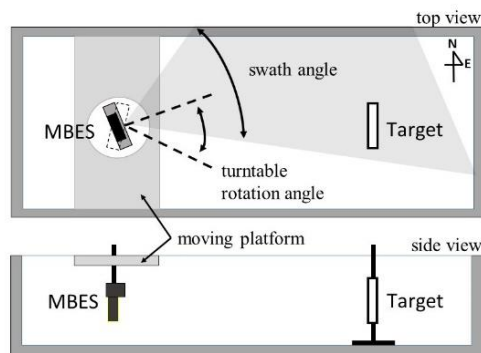


Fig. 1 Experimental setup overview.

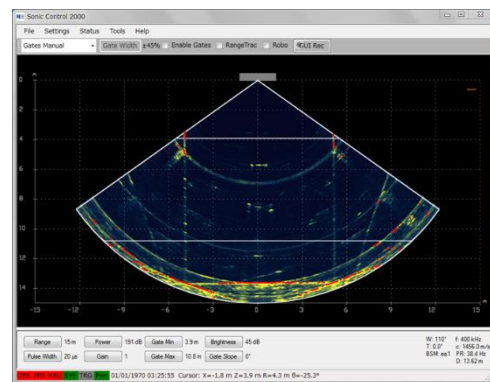


Fig. 2 Water column images of MBES experiment in a typical case.