# Development of seafloor geodetic observation system based on technology of AUV

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Institute of Industrial Science, University of Tokyo (IIS) and Hydrographic and Oceanographic Department, Japan Coast Guard have been constructing the geodetic observation network on the seafloor around Japan. The observation network, which consists of eighteen seafloor geodetic reference stations, has been built along the ocean trench regions.

We launched a project supported by the Japan Society for the Science Promotion as the Grants in Aid for Scientific Research. In this project, we are aiming at developing new-generation seafloor geodetic observation system based on technology of underwater robotics.

The current observational method using research vessel cannot help being subjected to cruise schedule of research vessels. It has been difficult for us to change the cruise schedule as appropriate according to weather and sea condition, GPS satellite distribution and so on.

The new system, which we are developing, based on AUV technology will give us opportunities for observation with choosing favorable conditions of sea and GPS satellite distribution, much more frequent observations and flexible planning of observation in response to sudden geodetic events.

Trial model of the on-board unit and seafloor mirror transponder were finished. We conducted several performance evaluation tests. The first trial of this system was conducted in the Sagami bay on 10th May. r2D4 was used as test bed AUV. The r2D4 is an intelligent AUV developed by Prof. Tamaki Ura (IIS). The r2D4 with the system could cruise successfully along the scheduled five nm profile arranged previously at depth of 50 cm beneath the sea surface.

We will report the overview of the new seafloor geodetic observation system aided by AUV technology, based on the several performance tests that were conducted at sea, dam site and tank.