

AUV, ROV および深海曳航体を用いた精密磁気・電気探査システムの開発

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Development of precise magnetic and electrical exploration systems by using AUV, ROV and deep-tow system

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Geophysical surveys near the sea floor are very effective methods in order to investigate fine structures of the oceanic crust. Recently, research and development of those new technologies have been energetically pushed forward. It is mainly related to international situation for natural resources like increased competition of resources development, a stable supply of the resources, and so on. But those technologies have been also important for a general study of the sea floor. From such a standpoint, we have been developing new electrical and magnetic exploration systems by using AUV (Autonomous Underwater Vehicle), ROV (Remotely Operated Vehicle), and deep-tow system in order to estimate structures of the sea floor in detail. Since this study started in 2008, we made each device of magnetic and electrical exploration systems on an experimental basis. The magnetic exploration system was tested in the Kumano Basin during the R/V Yokosuka cruise in July, 2009, above Aogashima volcano in October, 2009, and in the Bayonnaise submarine caldera area during the R/V Bosei Maru cruise in June, 2010. AUV Urashima and towing vehicle Yokosuka Deep-Tow (both are JAMSTEC vehicles) were used in the first test, and a helicopter (Nakanihon Air Service) was done in the second one. In the third test, titanium towing frame specially designed for a magnetometer (Chiba Univ.) was used. The electrical exploration system was tested off Miho in Suruga Bay in September and December, 2009, and in the Japan trench during the R/V Kairei cruise in November, 2009. The R/V Hokuto of Tokai University was used in the first and second tests, and ROV Kaiko 7000II was used in the last one. These tests gave us basic data of the systems for the platforms and the confirmation of their performance. They showed that the systems approached to practical tools. We proceed with the development on basis of the trial results. We will introduce the present state of the development centered on the outline of the tests. Note that this study has been conducted under a development program of fundamental tools for exploration of deep seabed resources by MEXT.