Marine deep-towed DC resistivity survey in a methane hydrate area, off Tokai, Japan

Tada-nori Goto[1]; Takafumi Kasaya[1]; Masataka Kinoshita[1]

[1] JAMSTEC

http://www.jamstec.go.jp/res/ress/tgoto/

We have developed a new deep-towed marine DC resistivity survey system. It was designed to detect the top boundary of the methane hydrate zone, which is not imaged well by seismic reflection surveys. A survey was carried out off Tokai, Japan, where methane hydrate zones were discovered in a deep borehole. We successfully obtained DC resistivity data along a profile about 6 km long, and obtained apparent resistivity distribution along the profile. The value is quite stable, so that our system can obtain data stably. The sub-seafloor structure obtained by a 1-D inversion procedure is consistent with the resistivity logging result along the borehole. Therefore, accuracy of our system is proven. Although the penetration depth of our system was limited in this experiment and was less than the depth of methane hydrate zones, marine DC resistivity surveys will be a new tool to image sub-seafloor structures with methane hydrate zones.