

Mado Megamullion: a potential new target for IODP drilling to understand backarc basin lithosphere

**Yasuhiko Ohara (Hydrographic and Oceanographic Department of Japan /JAMSTEC/
Nagoya University)**

Masakazu Fujii (National Institute of Polar Research)

Norikatsu Akizawa (Atmosphere and Ocean Research Institute, University of Tokyo)

Valentin Basch (University of Pavia)

Yumiko Harigane (Geological Survey of Japan)

Ken-ichi Hirauchi (Shizuoka University)

Osamu Ishizuka (Geological Survey of Japan)

Shiki Machida (Chiba Institute of Technology)

Katsuyoshi Michibayashi (Nagoya University)

Kyoko Okino (Atmosphere and Ocean Research Institute, University of Tokyo)

Alessio Sanfilippo (University of Pavia)

Camilla Sani (University of Pavia)

Atlanta Sen (University of Houston)

Jonathan E. Snow (Louisiana State University)

Kenichiro Tani (National Science Museum)

Hiroyuki Yamashita (Kanagawa Prefectural Museum of Natural History)

Oceanic core complexes (OCCs) or megamullions are domal bathymetric highs with axis-normal corrugations, and with exposure of serpentinitized peridotite and gabbroic rocks, interpreted as exhumed footwalls of low-angle detachment faults. OCCs are the only places at which the crust/mantle boundary is to be reached by ocean drilling with current technology.

A significant fraction of the ocean floor is created in backarc basins where water plays a major role in their magmatic process, strikingly contrasting to those at mid-ocean ridges. A better understanding of the architecture and composition of backarc basin will therefore be an important contribution to understanding the oceanic crustal accretion process globally. However, there has been no single core of lower oceanic crust and uppermost mantle of backarc basin to characterize this important tectonic setting. We have thus been working on an IODP proposal to drill an OCC in backarc basin setting, Godzilla Megamullion, the largest known OCC on the Earth, located in the extinct Parece Vela Basin in the Philippine Sea.

Here, we introduce our intention to drill another backarc OCC, Mado Megamullion in the Shikoku Basin in the Philippine Sea. Mado Megamullion is an ~20 km square OCC, the areal size comparable to typical OCCs in the Mid-Atlantic Ridge, such as Atlantis Massif and Kane Megamullion. It thus should be easier for us to make a comparative study between Mado Megamullion and the Mid-Atlantic Ridge OCCs, providing useful information to understand the differences of the lithospheric characteristics between the two major ocean settings.

We believe that IODP drilling of Godzilla Megamullion will provide important datasets to understand the presence of a unique OCC on the Earth. On the other hand, IODP drilling of Mado Megamullion will provide important datasets to understand the difference of the lithospheric characteristics between the two major ocean settings. In this contribution, we will summarize the available datasets to make an IODP drilling proposal and discuss its scientific framework.