Cruise Summary

1. Cruise Information

● Cruise ID: YK23-05S

● Name of vessel: Yokosuka

● Title of cruise: Toward the understanding of the tectonics of juvenile stage of the Philippine Sea Plate: Shinkai dive study at the West Philippine Basin oceanic core complexes

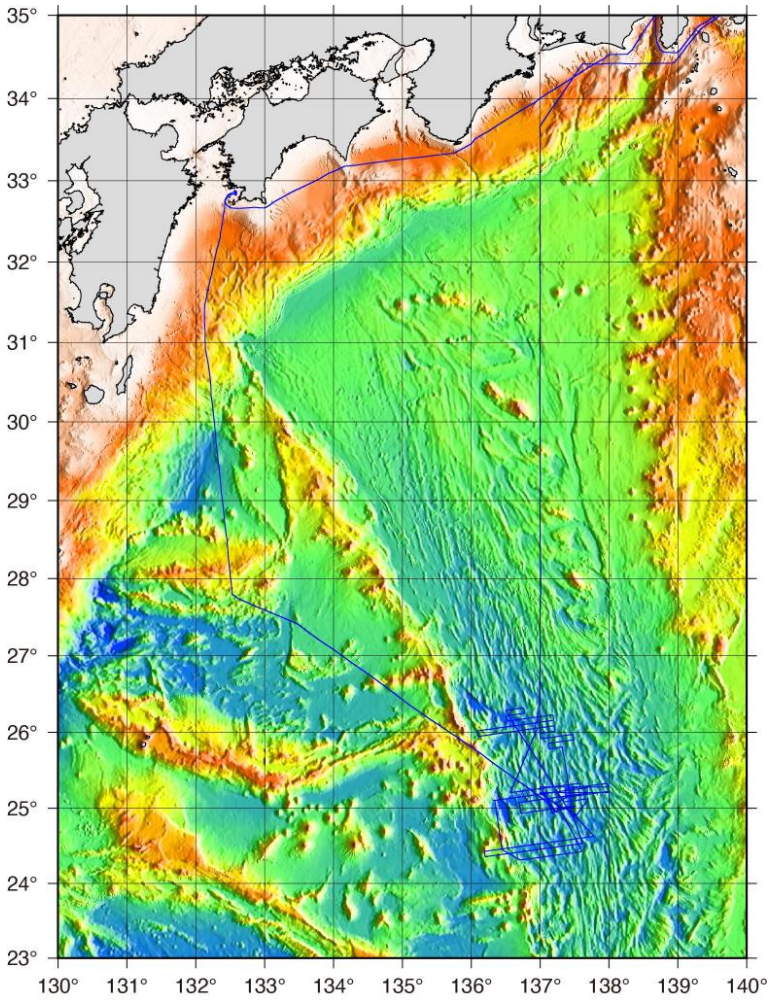
● Chief Scientist [Affiliation]: Yasuhiko OHARA (Hydrographic and Oceanographic Department of Japan/JAMSTEC/Nagoya University)

● Cruise period: April 2, 2023 to April 19, 2023

●Ports of departure / call / arrival: Yokosuka to Yokosuka

● Research area: Shikoku Basin

○ Research map



● Representative of Science Party [Affiliation]: Yasuhiko OHARA (Hydrographic and Oceanographic Department of Japan/JAMSTEC/Nagoya University)

2. Overview of Research Activities

● (Individual activity title): YK23-05S cruise overview

- Purpose, background: Oceanic core complexes (OCCs), or megamullions, are domal bathymetric highs with axis-normal corrugations, and with exposure of serpentinized peridotites and gabbroic rocks, interpreted as exhumed footwalls of low-angle detachment faults. OCCs provide a valuable opportunity to directly study the architecture of oceanic lithosphere, together with the tectono-magmatic processes associated with its formation and evolution. Although the extensive multi-beam bathymetric mapping by Japan's continental shelf survey has revealed the presence of potential OCCs in the multiple portions of the Philippine Sea Plate, these OCCs are remained largely unsampled except only a few locations that were sampled as reconnaissance study sites. In order to advance our understanding of the lithospheric composition of the Philippine Sea Plate, we need to utilize the Philippine Sea OCCs as tectonic windows to sample the lower crust and upper mantle materials. Among these OCCs, the West Philippine Basin OCCs have never been sampled before, and therefore we set them as the primary survey area for the YK23-05S cruise. However, because of rough sea condition due to low pressure developed off the Shikoku Island, Japan, and because of emergence of infant tropical cyclone off the Philippines, we were not able to get to the West Philippine Basin OCCs, and instead, we made our scientific activity on the Western Shikoku Basin OCCs as a contingency plan.
- Activities (observation, sampling, development): The main activity of YK23-05S cruise was to make a systematic sampling of, and to obtain detailed geophysical data over the Western Shikoku Basin OCCs, here we named "Nankaido Megamullions".
- Methods, instruments: We used DSV Shinkai 6500 for visual observation and bottom samplings.
- Results: We were successful in completing five Shinkai dives as shown in below.

Date	Dive	Locality	Event	Time (JST)	Depth (m)	Latitude	Longitude	Observer	Samples (Total weight)
2023-04-07	6K-1675	Sanuki Megamullion	On bottom	11:24	5544	24°59.2668'N	137°16.9108'E	Yasuhiko Ohara	Serpentinite, olivine gabbro, coarse-grained gabbro, gabbro, oxide gabbro, plagiogranite, pumice, mudstone and mud (~60 kg)
			Off bottom	15:08	4685	24°58.8332'N	137°17.6387'E	Ryosuke Oyanagi	
2023-04-08	6K-1676	Tosa Megamullion	On bottom	11:45	5290	25°03.3557'N	137°13.3027'E	Yumiko Harigane	Peridotite, plagioclas-peridotite, mudstone, mud and fish (~55 kg)
			Off bottom	15:17	4579	25°03.4606'N	137°12.3611'E	Marco Cuffaro	
2023-04-11	6K-1677	Awa Megamullion	On bottom	11:26	5643	24°53.9421'N	137°29.4957'E	Alessio Sanfilippo	Mn-crust, pumice and mudstone; one Mn-crust sample includes tiny fragments of peridoite, gabbro and basalt (~12 kg)
			Off bottom	15:16	4778	24°55.4836'N	137°30.2852'E		
2023-04-12	6K-1678	Tosa Megamullion	On bottom	11:34	5624	24°55.6741'N	137°11.1327'E	Katsuyoshi Michibayashi	Peridotite, plagioclase-peridotite, pumice, mudstone and mud (~52 kg)
			Off bottom	15:09	5027	24°56.4964'N	137°11.7872'E		
2023-04-13	6K-1679	Tosa Megamullion	On bottom	11:24	5635	25°03.8981'N	137°13.6369'E	Jonathan E. Snow	Plagioclase-peridotite, scoria, mudstone and mud (~30 kg)
			Off bottom	15:14	4738	25°03.7241'N	137°12.4552'E		