



R/V *Shinseimaru* Cruise Report
KS-23-J02

Sea Trial of ROV *Hyper Dolphin*

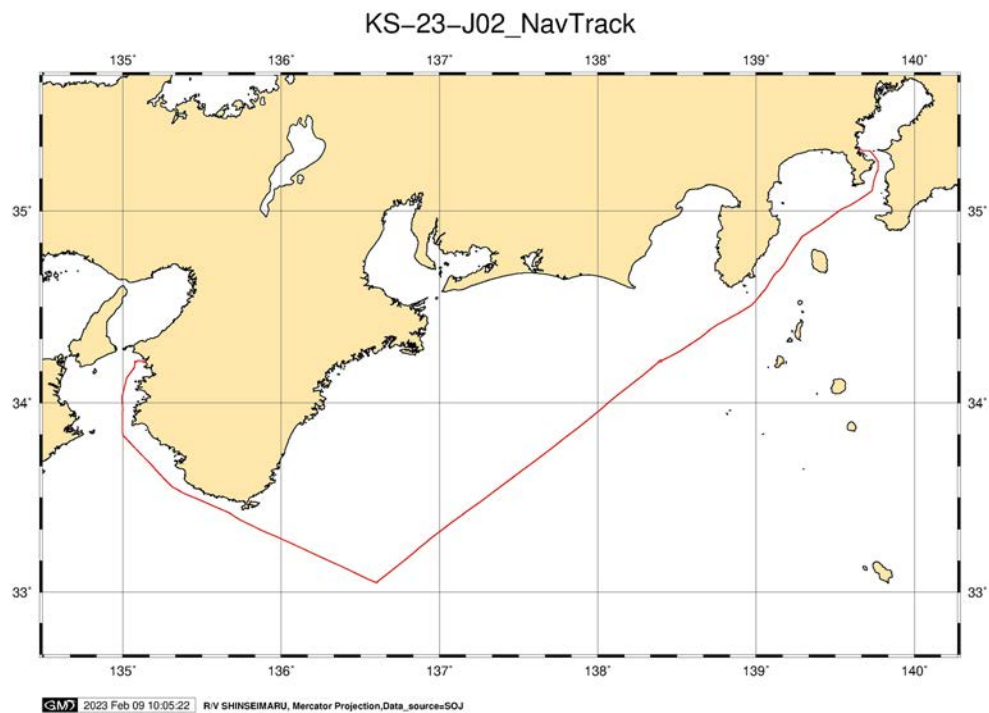
Research area:
North of Nankai Trough, Kumano Nada
Feb.6,2023-Feb.9, 2023

Japan Agency for Marine-Earth Science and Technology
(JAMSTEC)

1. Cruise Information

- Cruise ID: KS-23-J02
- Name of vessel: R/V *Shinseimaru*
- Title of cruise: Sea trial of ROV *Hyper-Dolphin*
- Chief Scientist: Yoshinobu Nambu
- Cruise period: February 6th, 2023 - February 9th, 2023
- Ports of departure/arrival: JAMSTEC Headquarter, Yokosuka/ Wakayama-Shimotsu Port
- Research area:
 - North of Nankai Trough,
[34° 15.0' N, 138° 25.0' E], [34° 15.0' N, 138° 45.0' E],
[33° 45.0' N, 138° 30.0' E], [33° 45.0' N, 137° 45.0' E]
 - Kumano Nada.
[33° 45.0' N, 137° 00.0' E], [33° 45.0' N, 137° 15.0' E] , [32° 30.0' N, 137° 15.0' E]
[32° 30.0' N, 135° 30.0' E], [33° 00.0' N, 135° 30.0' E] , [33° 00.0' N, 136° 00.0' E]

- Research map



2. Research Proposal and Science Party

- Title of proposal
 - Sea trial of ROV *Hyper-Dolphin*
- Representative of the science party [Affiliation]
NAMBU YOSHINOBU [JAMSTEC]
- Science party (*on shore)
 - NAMBU YOSHINOBU [JAMSTEC]
 - OMIKA SHINOBU [JAMSTEC]
 - NUNOURA TAKURO* [JAMSTEC]
 - SUMIDA TOMOMI [JAMSTEC]

KOBAYASHI KANAE
HIRAOKA SATOSHI
HUKUYAMA YUTO

[JAMSTEC]
[JAMSTEC]
[JAMSTEC]

● SHINSEIMARU Crew

Captain
Chief Officer
2nd Officer
3rd Officer
Chief Engineer
1st Engineer
2nd Engineer
3rd Engineer
Chief Electronics Op.
2nd Electronics Op.
Boat Swain
Able Seaman
Able Seaman
Able Seaman
Able Seaman
Sailor
Sailor
No.1 Oiler
Oiler
Oiler
Assistant Oiler
Assistant Oiler
Chief Steward
Steward
Steward

NAKAMURA YOSHIYUKI
SHISHIKURA TAKAAKI
NOZAWA TATSUYA
OBATA YUTO
ABE TADASHI
IKEGUCHI KENTA
YAMAGUCHI KATSUTO
SHIMADA KEITO
SAITAKE HIROYASU
SHIROZUME TAKATOMO
HIROSAKI KANAME
OKADA MASASHIGE
MIYASHITA TAKUYA
NAKANISHI TORU
MIURA TAKUMI
MATSUDA TAISEI
NAKANO MIZUKI
YOSHIDA KATSUYUKI
MIYAZAKI KATSUYUKI
SUZUKI RYOTA
KAYABA SHODAI
MATSUMOTO HARUKI
KOSUJI KIYOTAKA
NAGATOMO TSUYOSHI
YAMAMOTO KOKI

● Hyper-Dolphin Operation Team

Operation Manager
1st ROV Operator
2nd ROV Operator
2nd ROV Operator
2nd ROV Operator
3rd ROV Operator

KIDO TEPPEI
SHIGETAKE SEIJI
IHARA SHOTA
TAYAMA YUDAI
SAKAKIBARA YUDAI
IWATA KUNIHIRO

3. Research/Development Activities

- Sea trial of ROV *Hyper-Dolphin*

Annual sea trial of Hyper-Dolphin was conducted at water depths up to 3,193m to confirm the integrity of the equipment and system after land maintenance. Operation training using maneuvers and manipulators was also conducted.



Fig.3.1. ROV *Hyper-Dolphin* (Dive#2193)

Dive #2192, Sea trial and additional work was performed at the North of Nankai Trough (WD = 3,015m). Operation tests of each device were performed. Dive #2193, Sea trial and additional work was performed at the Kumano Nada (WD = 3193m). During dive#2192 and 2193, Manipulator operation, camera photography, vehicle operation training and acoustic positioning system test were conducted with monitoring acoustic data.

- additional work 1: Sediment sampling for deep-sea bioresource Open Innovation Project (OIP)

OIP provides microbiological and environmental genetic resources such as microbial strains, deep-sea sediments for isolation of microbes and for environmental DNA, and environmental DNA sequences, to industry and academy for industrial purposes. During this cruise, OIP takes deep-sea sediment samples for the resources and samples for environmental parameters associated with them such as pore-water geochemistry, sediment organic geochemistry and microbial diversity.

additional work 2: Sediment sampling for Geochemical measurements and biological analyses

Benthic N₂ production by microbial denitrification and anaerobic ammonium oxidation (anammox) is the largest fixed nitrogen loss in the oceans. We investigate the contribution of anammox bacteria to the fixed nitrogen loss in the deep-sea sediments in order to reveal a fully functional benthic nitrogen cycle. We thus collected sediments and pore-water to analyze geochemical parameters and microbial diversity. In addition, oxygen concentration of the overlying water and surface sediments was measured using a microelectrodes.

4. Cruise Log

Date	Local Time	Description
2023/2/6 Mon.	08:00	Scientists party onboard a vessel
	09:00	Departed from JAMSTEC Headquarter, Yokosuka
	09:30	Onboard lecture
	19:40	Arrived at North of Nankai Trough
2023/2/7 Tue.	06:33	Deployed XBT
	08:13	Launched HPD, Dive #2192
	10:15	Landed sea bottom (D = 2,991m) Conducted function test
	13:00	Left sea bottom (D =3,015m)

	14:45	Recovered HPD
	15:00	Departed from North of Nankai Trough
2023/2/8 Wed.	00:50	Arrived at Kumano Nada
	06:26	Deployed XBT
	08:11	Launched HPD, Dive #2193
	10:12	Landed sea bottom (D = 3,190m) Conducted function test
	11:45	Left sea bottom (D = 3,193m)
	13:30	Recovered HPD
	13:45	Departed from Kumano Nada
2023/2/9 Thu.	10:00	Arrived at Wakayama-Shimotsu Port

5. Notice on Using

This cruise report is a preliminary documentation as of the end of cruise.

This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If you are going to use or refer the data on this report, it is recommended to ask the Chief Scientist for latest status.

Users of information on this report are requested to submit Publication Report to JAMSTEC.

<http://www.godac.jamstec.go.jp/darwin/explain/1/e#report>

E-mail: submit-rv-cruise@jamstec.go.jp