



R/V *Shinseimaru* Cruise Report
KS-19-J05

Sea Trial of ROV *Hyper Dolphin*

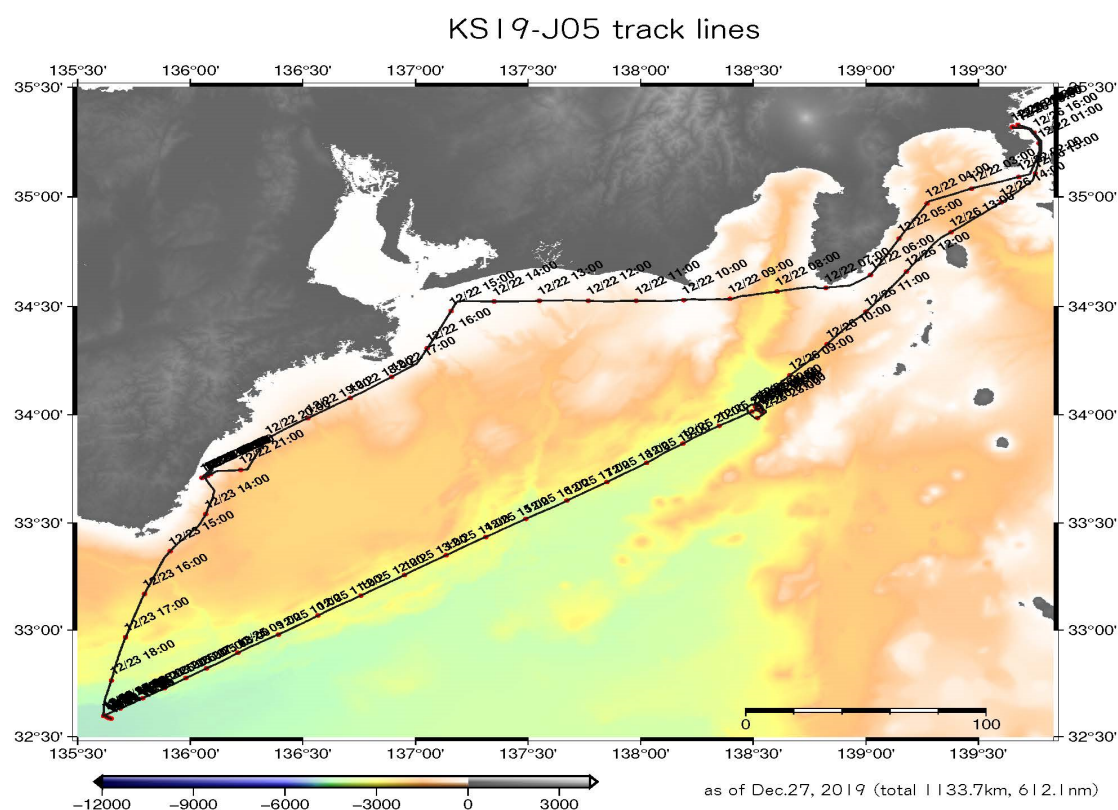
Research area:
Kumano-nada, Northern Nankai Trough
Dec.22,2019-Dec.27,2019

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

1. Cruise Information

- Cruise ID: KS-19-J05
- Name of vessel: R/V *Shinseimaru*
- Title of cruise: Sea trial of ROV *Hyper-Dolphin*
- Chief Scientist: Yoshinobu Nambu
- Cruise period: December 22, 2019 to December 27, 2019
- Ports of departure/arrival: JAMSTEC Headquarter, Yokosuka
- Research area:
Kumano-nada, Northern Nankai Trough, Water depth 200m-4,750m
[33° 50.00'N, 136° 10.00'E],[33° 50.00'N, 137° 00.00'E]
[32° 30.00'N, 137° 00.00'E],[32° 30.00'N, 135° 30.00'E]

- Research map



2. Research Proposal and Science Party

- Title of proposal
Sea trial of ROV *Hyper-Dolphin*

- Representative of the science party [Affiliation]

Yoshinobu NAMBU	[JAMSTEC]
Takuro Nunoura	[JAMSTEC]
Tomoaki Kitayama	[JAMSTEC]
- Science party (*on shore)

Yoshinobu NAMBU	[JAMSTEC]
Keita AKIYAMA	[JAMSTEC]

Yukari KIDO	[JAMSTEC]
Chihiro BABA	[JAMSTEC]
Natsumi OKUTSU*	[JAMSTEC]
Takuro NUNOURA*	[JAMSTEC]
Tomomi SUMIDA	[JAMSTEC]
Masayuki MIYAZAKI	[JAMSTEC]
Tomoaki KITAYAMA*	[JAMSTEC]
Naoto HIGA*	[JAMSTEC]

● SHINSEIMARU Crew

Captain	SHISHIKURA TAKAAKI
Chief Officer	EGASHIRA TAKESHI
2nd Officer	YUKAWA TOMOHIRO
3rd Officer	OKADA MASAKI
Chief Engineer	KUROSE WATARU
1st Engineer	TADOOKA NAOHITO
2nd Engineer	YAMAGUCHI KATSUTO
3rd Engineer	SUGIMOTO SHINGO
Chief Electronics Op.	NASU TOKINORI
2nd Electronics Op.	MATSUI RYOSUKE
Boat Swain	HIROSAKI KANAME
Able Seaman	NAKAE KENJI
Able Seaman	MATSUO YOSHIAKI
Able Seaman	UENO SHINYA
Able Seaman	NASU KENTA
Able Seaman	HORI FUMIHIRO
Sailor	YOSHIMI YUDAI
Sailor	NAGAYAMA TOSHIKI
No.1 Oiler	YAMAGUCHI YUKIHIRO
Oiler	WATANABE TAKUYA
Oiler	HIDAKA TORU
Assistant Oiler	KAWANO MOTOHIRO
Assistant Oiler	MANNA SHOUTA
Chief Steward	CHIKUBA YUKIHIDE
Steward	TAKAMA TOSHIYUKI
Steward	NOJIRI TAKEHIRO

● Hyper-Dolphin Operation Team

Operation Manager	TEPPEI KIDO
2nd ROV Operator	SHIGERU KIKUYA
2nd ROV Operator	YUDAI SAKAKIBARA
2nd ROV Operator	YUDAI TAYAMA
3rd ROV Operator	TAIKEN YAMAGUCHI
3rd ROV Operator	WATARU ASANO

3. Research/Development Activities

●ROV *Hyper-Dolphin* Cable free fall

Perform a free fall on the umbilical cable (# 6) to be newly mounted, and press-fit the rust preventive and measure the rotation characteristics.

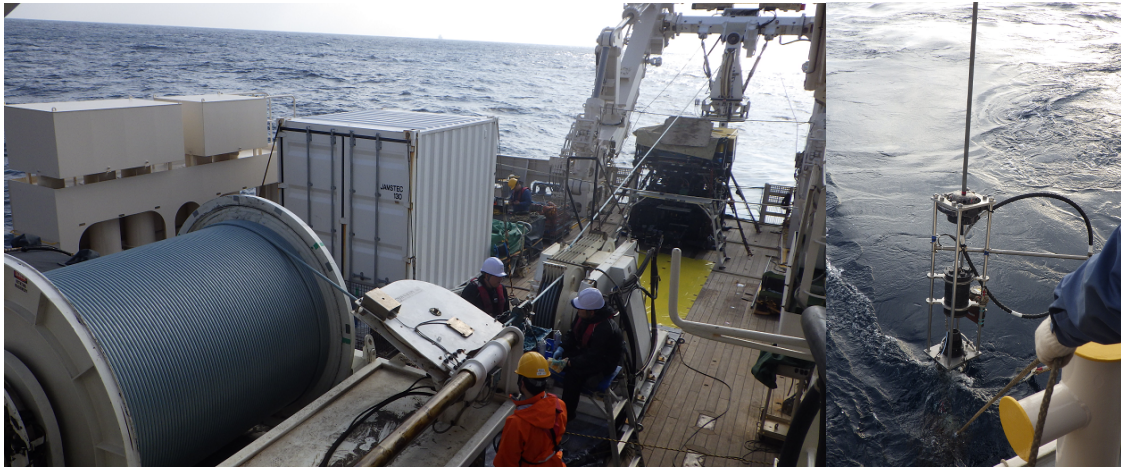


Fig.3.1. Cable free fall

A free fall was performed on the new umbilical cable # 6 for 2 days, and it was confirmed that there was no abnormality in the appearance of the cable and the electrical and optical characteristics. The rotation characteristics at a cable length of 4500m were also obtained.

●Sea trial of ROV *Hyper-Dolphin*

Annual sea trial of *Hyper-Dolphin* was conducted at depths up to the maximum dive depth to confirm the integrity of the equipment and system as a whole after land maintenance. Operation training using maneuvers and manipulators was also conducted.

- (1) During the test dive (500 m to 4,500 m depth), conduct an operation test for each test item described in the sea trial manual to confirm the soundness of the system.
- (2) Evaluate the operation by installing a newly manufactured spare SGK responder / transponder.
In addition, underwater noise measurement using a smart hydrophone is performed.
- (3) Conduct general training on aircraft operations, such as undersea vehicle navigation and manipulator work.



Fig.3.2. ROV *Hyper-Dolphin* (Dive#2097)

Dive #2097, WD3,530m, Sea trial was conducted at the northern edge of the Nankai Trough. At a depth of 3530m, operation tests of each device were performed and it was confirmed that there was no

abnormality. The transponder mode of the new SGK responder responded with the vehicle motor stopped. The ambient noise of the vehicle was also measured.

In addition, manipulator operation, camera photography and vehicle operation training were conducted.

●Other additional work

(1) Sediment sampling for Open Innovation Platform (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.

(2) Image analysis and shooting of materials for marine science content using ROV *Hyper dolphin* HDTV cameras.

The camera mounted on the "*Hyper Dolphin*" was adjusted to about 45 degrees with respect to the sea floor, and the video was taken while traveling at a constant speed of about 50 m at a vehicle altitude of 1 m to 2 m.

4. Cruise Log

Date	Local Time	Description	Position (Noon)
Sun.22.Dec	08:00	Scientists party onboard a vessel	
	08:45	Kick off Meeting	
	09:00	Departed from JAMSTEC Headquarter, Yokosuka.	
	10:00	Transited to Kumano-nada. Onboard lecture	(o North 5 3 1 7)
Mon.23.Dec	06:00	Arrived at off Shingu. Suspended cable free fall at Kumano-nada due to rough sea	Off Shingu 33-43.0N,136-04.5E
	18:00	Scientist Meeting	(bc NW 2 1 2 8)
Tue.24.Dec	06:00	Arrived at Kumano-nada, FF area.	Kumano-nada
	08:43	Started to pay out the cable for free fall.	32-36.0N,135-37.0E
	12:31	Hold with a cable length of 4,500m for 20 min.	Free fall of the
	12:51	Started to roll up the cable.	umbilical cable #6
	15:30	Recovered cables.	
	18:00	Scientist Meeting	(bc NNW 4 3 4 8)
Wed.25.Dec	07:09	Started to pay out the cable for free fall.	Kumano-nada
	09:23	Hold with a cable length of 4,500m for 20 min.	32-36.0N,135-37.0E
	09:43	Started to roll up the cable.	Free fall of the
	12:01	Recovered cables.	umbilical cable #6
	12:15	Transited to Northern Nankai Trough.	
	18:00	Scientist Meeting	(bc SSE 2 2 2 8)
Thu.26.Dec	09:15	Arrived at Northern Nankai Trough.	Northern Nankai
	09:26	Deployed XBT.	Trough
	11:14	Launched HPD.	34-01.5N,138-31.0E
	13:55	Landed on sea bottom, water depth 3556m. Conducted function test and training. Working on the seafloor	Depth:3,530m Dive#2097
	14:52	Left sea bottom, water depth 3556m.	
	16:49	Recovered HPD.	
	17:00	Transited to JAMSTEC Headquarter, Yokosuka	

	18:00	Scientist Meeting	(c WSW 2 2 2 8)
Fri.27.Dec	08:30	Arrived at JAMSTEC Headquarter, Yokosuka	

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>
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