



Mirai Cruise Report
MR23-01C

Experiments of
Time Reversal MIMO Acoustic Communication

Western area of Kyushu

Jan.21,2023-Feb.07,2023

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

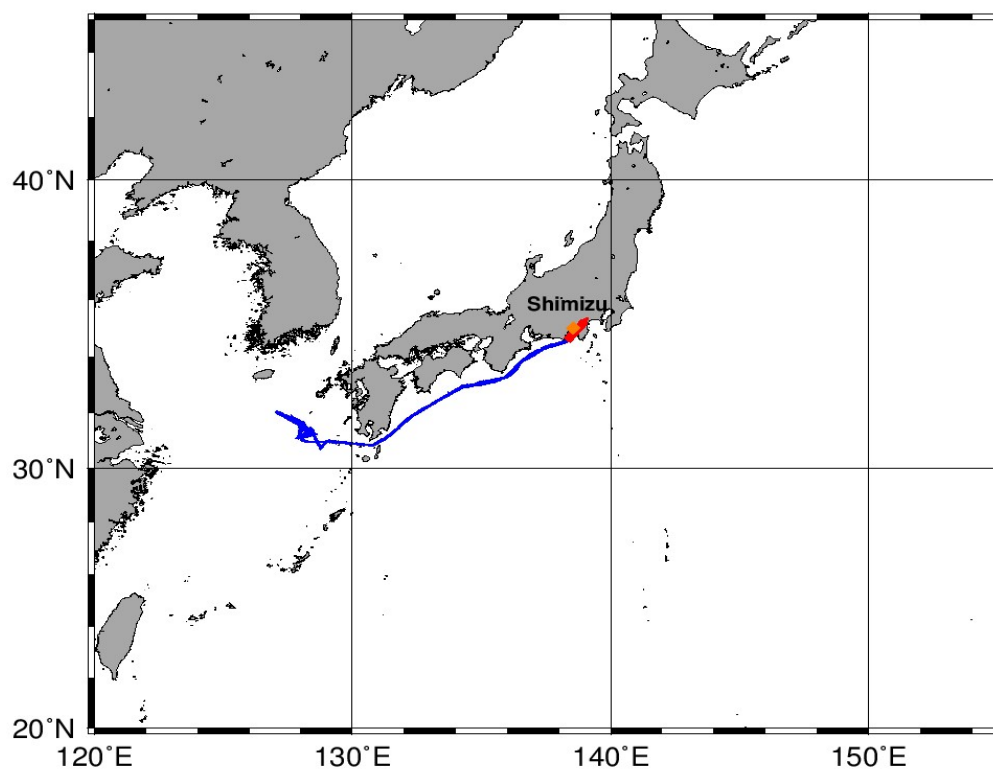
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1. Cruise Information

Cruise ID :MR23-01C
Name of vessel :Mirai
Title of cruise : Research on time reversal MIMO acoustic communication
Chief Scientist :Mitsuyasu Deguchi [JAMSTEC]
Cruise period :Jan. 21, 2023 – Feb. 07, 2023
Ports of departure / call / arrival: Shimizu – Shimizu
Research area :Western area of Kyushu
Research map

MR23-01C



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2. Science Party

Chief Scientist

Mitsuyasu DEGUCHI [JAMSTEC]

Science Party

Yoshitaka WATANABE	[JAMSTEC]
Kenjiro OKADOME	[JAMSTEC]
Seiji KUROSAKI	[Nippoe Denshi Ltd.]
Hiroki MIYATA	[Nippoe Denshi Ltd.]
Shuichiro TERADA	[Shoshin Corp.]
Ryutaro YAMAO	[Shoshin Corp.]
Mai KUMAGAI	[Shoshin Corp.]

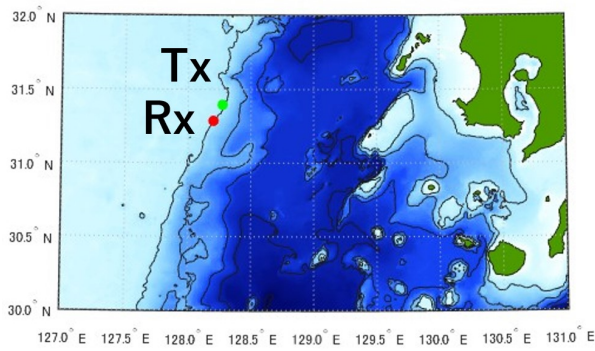
3. Research Activities

(1) objective

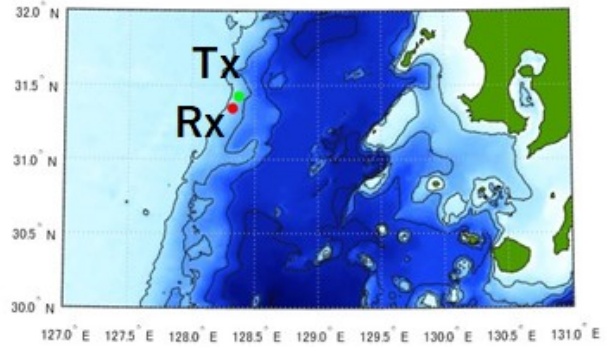
This cruise was a part of the research on MIMO acoustic communication using time reversal. The experiments were carried out in the western area of Kyushu of water depth from 150 to 300 m. The characteristic of acoustic channel in the areas was measured in the previous cruise, MR22-01C. In this cruise, a transmitter array with 7 channels and a receiver array with 24 channels were moored and MIMO communication experiments were carried out.

(2) Measurement

Moored date	Recovery date	Transmitter		Receiver Array	
Jan. 26th ,2023	Jan. 29th,2023	31°23.954'N	128°16.3263'E	31°17.1455'N	128°12.3226'E
Jan.31th, 2023	Feb. 3rd,2023	31°25.519'N	128°22.2374'E	31°20.607'N	128°19.3184'E



(a) Moored at Jan. 26th, 2023



(b) Moored at Jan. 31th 2023

Fig. 2 Maps showing locations where Tx and Rx arrays were moored.

4. Cruise Log

Jan. 21, 2023	Departure from Shimizu
Jan. 22, 2023	Shifting to the western area of Kyushu
Jan. 23, 2023	Shifting to the western area of Kyushu
Jan. 24, 2023	Waiting for weather recovery due to abysmal weather
Jan. 25, 2023	Waiting for weather recovery due to abysmal weather
Jan. 26, 2023	Deployment of Tx and Rx arrays (mooring)
Jan. 27, 2023	Automatic measurement by the arrays
Jan. 28, 2023	Automatic measurement by the arrays
Jan. 29, 2023	Recovery of both arrays
Jan. 30, 2023	Maintenance for both arrays
Jan. 31, 2023	Deployment of Tx and Rx arrays (mooring)
Feb. 01, 2023	Automatic measurement by the arrays
Feb. 02, 2023	Automatic measurement by the arrays
Feb. 03, 2023	Recovery of both arrays
Feb. 04, 2023	Shifting to Shimizu
Feb. 05, 2023	Shifting to Shimizu
Feb. 06, 2023	Staying at Shimizu
Feb. 07, 2022	Arrival at Shimizu

● 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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