# B. Underway measurements

## Navigation

*27 March 2024*

### Personnel

MURAKAMI Kiyoshi (JMA)

SEGAWA Takahiro (JMA)

### Overview of the equipment

The ship's position was measured by navigation system manufactured by FURUNO ELECTRIC CO., LTD., Japan. The system has three 12-channels GPS receivers (GP-150, GP-170, JLR-7800).

GPS antennas were installed on the compass deck. We switched the receivers to choose better receiving state if the number of received GPS satellites was small or HDOP was large. The GPS data, gyro heading data and log speed data were integrated and delivered to two workstations. These workstations work as the primary and secondary NTP (Network Time Protocol) servers.

The navigation data were obtained approximately every one second and one minute data were extracted from one second data. These one minute data were recorded as "LOG data (GPS data)".

### Data Period

03:01, 27 Jul. 2022 to 22:59, 19 Aug. 2022 (UTC).

03:15, 24 Aug. 2022 to 00:00, 15 Sep. 2022 (UTC).

03:45, 29 Sep. 2022 to 00:00, 19 Oct. 2022 (UTC)

## 2．Bathymetry

*27 March 2024*

### Personnel

MURAKAMI Kiyoshi (JMA)

SEGAWA Takahiro (JMA)

### Overview of the equipment

R/V Ryofu Maru equipped a single beam echo sounder, EA 600 (Kongsberg Maritime, Norway). The main objective of the survey is to collect continuous bathymetry data along ship's track.

The sound speed to correct depth data was set to 1500 m/s during the cruise. Data interval was about 10 seconds in the measurement for 7500 m depth.

### System Configuration and Performance

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| System: | Kongsberg EA 600 |
| Frequency: | 12 kHz |
| Transmit power: | 2 kW |
| Transmit pulse interval: | Within 20 seconds |
| Depth range: | 5–15,000 m |
| Depth resolution: | 1 cm |
| Depth accuracy (Assuming correct sound velocity, transducer depth and shortest pulse length): | Within 20 cm |

### Data Period

03:01, 27 Jul. 2022 to 05:00, 03 Aug. 2022 (UTC).

21:20, 03 Aug. 2022 to 22:59, 19 Aug. 2022 (UTC).

03:15, 24 Aug. 2022 to 00:00, 15 Sep. 2022 (UTC).

03:45, 29 Sep. 2022 to 00:00, 19 Oct. 2022 (UTC)