

## For Using Data

|                        |  |
|------------------------|--|
| Data Policy            | JAMSTEC  |
| Principal Investigator | Data Management Office                           |
| Use Constraints        | See Terms and Conditions about constrain of use. |
| Data Citation          | See Terms and Conditions about data citation.    |

**Quality** DMO-Processed

**Instrument**

Cesium magnetometer

**Overview**

The cesium vapor magnetometer measures the total magnetic by using electron paramagnetic resonance. In order to avoid the ship's magnetization, the instrument is towed by the vessel about 400 - 500m. As a quality control, data of low reliability was removed (see below).

Synthetic geomagneticfield values were calculated from IGRF models.

**Measurement System**

|                     |                        |
|---------------------|------------------------|
| Manufacturer :      | Geometrics, inc.       |
| Type :              | G-882                  |
| Measurement range : | 20,000 - 100,000 nT    |
| Accuracy :          | less than 3 nT         |
| Resolution :        | 0.004 nT               |
| Location :          | Navigation bridge deck |

**Data processing**

The following corrections and calculations were performed.

## 1) International Geomagnetic Reference Field (IGRF)

Synthetic geomagnetic field values are calculated from IGRF 14th generation models by using navigation data ; latitude, longitude and date.

Reference : IAGA Division V-MOD Geomagnetic Field Modeling\*.

\* <http://www.ngdc.noaa.gov/IAGA/vmod/igrf.html>

## 2) Calculation of the geomagnetic field anomaly

$$An = F - Figrf$$

An : Total geomagnetic field intensity anomaly

F : Observed total geomagnetic field intensity

Figrf : Synthetic total geomagnetic field intensity from IGRF

## 3) Output of the data

Time (UTC)

Latitude (degree)

Longitude (degree)

Observed total magnetic field intensity (nT)

Total geomagnetic field intensity anomaly (nT)

**Quality control of data**

Following criteria were used for removal of data of low reliability :

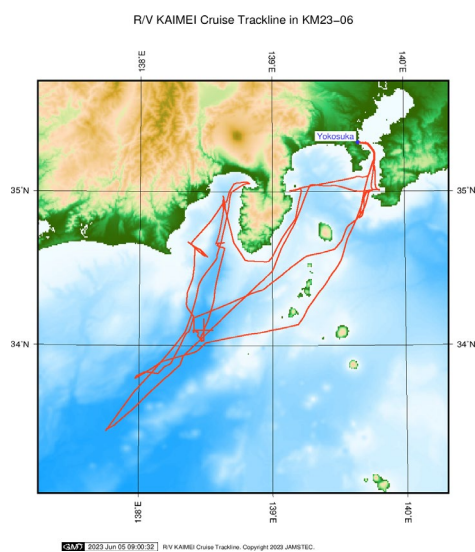
- Time error (inversion of time, continuation of same timestamps)
- Ground speed of the ship below 1 knot or exceeding 20 knot
- Total geomagnetic field intensity anomaly exceeding +/-4000 nT
- Spatial gradient of the total geomagnetic field intensity anomaly exceeding +/-300 nT/km

**Note**

- 1) File naming rule : Cruise ID\_corr.tmag
- 2) Sampling rate : 1 second (It depends on geomagnetic field intensity and inclination)
- 3) Geodetic system : WGS84
- 4) If you would like the raw data set, please contact DMO at "dmo@jamstec.go.jp".

## Related Information

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### KM23-06

|                  |   |
|------------------|---|
| Ship Name:       | KAIMEI  |
| Period:          | 2023/05/10 - 2023/05/23                         |
| Chief Scientist: | Kyoma Takahashi (JAMSTEC)                       |
| Proposal:        | R/V Kaimei & KM-ROV & Jinbei Engineering cruise |

## Format Description for TMI Corrected

| No. | Column  | Content  | Format   | Unit   | Remarks   |
|-----|---------|--|----------|--------|---|
| 1   | 1 - 8   | Date   | i4,i2,i2 |        | YYYYMMDD (UTC)  |
| 2   | 10 - 15 | Time   | i2,i2,i2 |        | hhmmss (UTC)  |
| 3   | 17 -25  | Latitude   | f9.5     | degree | No sign for the northern hemisphere.<br>Negative for the southern hemisphere. |
| 4   | 27 -36  | Longitude  | f10.5    | degree | No sign for eastern hemisphere.<br>Negative for the western hemisphere.       |
| 5   | 38 -45  | Observed total<br>geomagnetic field<br>intensity | f8.1     | nT     |   |
| 6   | 46 -53  | Total geomagnetic field<br>intensity anomaly     | f7.1     | nT     |   |