

KAIMEI KM17-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-12

[ReadMe](#) [Observation Data](#) [Data Format](#)

Cruise ID: [KM17-04](#)

Shipboard Three Component Magnetometer (STCM): Processed (DMO)-Corrected

Data Policy: [JAMSTEC](#)

Observation Items: X, Y and Z component of geomagnetic field anomaly, Absolute value of geomagnetic field anomaly

Science Keywords:

OCEANS > MARINE GEOPHYSICS > MARINE MAGNETICS
SOLID EARTH > GEOMAGNETISM

For Using Data

Principal Investigator

Data Management Office

Use Constraints

See [Terms and Conditions](#) about constrain of use.

Data Citation

See [Terms and Conditions](#) about data citation.

Period (UTC)

2017-05-04 07:15 – 2017-05-09 23:23

Instrument

Instrument:

Three component magnetometer



Overview

The data provided is for corrected three component geomagnetic field anomalies. Three-axes flux-gate sensors with ring-cored coils were fixed on the roof of the bridge.

They measure the following items :

h-component : along track line component, positive for the bow direction pitch.

s-component : across track line component, positive for the starboard side roll.

v-component : vertical component, positive for the downward direction.

The effect of ship motion was eliminated by roll and pitch data which was provided by a tilt sensor. The apparent magnetic influence can be detected through a "Figure of 8 turn"(a pair of clockwise and anti-clockwise turns) on each cruise. If no Figure of 8 turn on the cruise was completed, the latest Figure of 8 turn from the previous cruise was applied. As a quality control, data of low reliability was removed (see Data processing for quality control criteria). Synthetic geomagnetic field values were calculated from IGRF models.

Measurement System

(1) Magnetometer

Manufacturer : Tierra Technica Ltd.

Type : SFG-2015

Measurement range : $\pm 100,000$ nT

Accuracy : less than ± 200 nT

Resolution : 0.01 nT

Location : No.1 Laboratory

(2) Magnetic Sensor

Manufacturer : Tierra Technica Ltd.

Form : flux-gate sensors with ring-cored coils

Location : Compass deck

(3) Attitude sensor and Gyro compass

Manufacturer : IXBLUE

Type : PHINS

Accuracy(Roll, Pitch) : 0.01 degree

Accuracy(Gyro) : 0.01 degree *Secant(Lat.)

Location : Gravity meter room

Duration of the Figure of 8 turn

In KM17-02 cruise

Date (UTC)

2017/04/24 05:56:00 - 2017/04/24 06:17:00

Data processing

The following corrections and calculations were performed.

(1) Ship magnetization correction

$Hob = ARPYF + Hp \text{ ---(i)}$
 Hob: Observed magnetic field vector (Ship coordinates)
 A: Effect of induced magnetization of the ship
 R: Matrix of rotation due to the roll
 P: Matrix of rotation due to the pitch
 Y: Matrix of rotation due to the heading
 F: Geomagnetic field vector
 Hp: Ship's permanent magnetic moment

Following the equation(i), we calculate the geomagnetic field F.

$RPYF = BHob + Hbp \text{ ---(ii)}$
 B: coefficient of Figure of 8 turn
 Hbp: Permanent magnetic field vector of the ship

Reference: Isezaki,N., A new shipboard three-component magnetometer, GEOPHYSICS. VOL.51,NO10(1986);P1992-1998

(2) International Geomagnetic Reference Field (IGRF)

Synthetic geomagnetic field values are calculated from IGRF 12th 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>]

(3) Calculation of the geomagnetic field anomaly

$An = F - Figrf$
 An: Geomagnetic field anomaly vector
 F: Geomagnetic field vector
 Figrf: Synthetic geomagnetic field vector from IGRF

(4) Quality control of data

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

- Time error (inversion of time, continuation of same timestamps)
- Summation of the difference of heading by one second exceeding 20 degree per 5 minutes
- Ground speed of the ship below 3knot or exceeding 20knot
- X, Y, or Z component of geomagnetic field anomaly exceeding $\pm 4000nT$

(5) Filtering of the geomagnetic field anomaly

Due to the residual undulation of the ship, a 120 second length Gaussian filter was applied for each component of the geomagnetic field anomaly data.

(6) Output of the data

Time (UTC)
 Latitude (degree)
 Longitude (degree)
 X: Northward (positive on the north) component of geomagnetic field anomaly (nT)
 Y: Eastward (positive on the east) component of geomagnetic field anomaly (nT)
 Z: Vertical (positive for downward) component of geomagnetic field anomaly (nT)
 T: Absolute value of geomagnetic field anomaly (nT)

Coefficient of the Figure of 8 turn and Permanent magnetic field vector of the ship

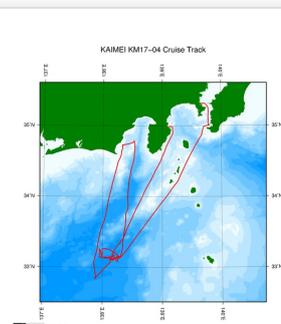
This coefficient was calculated from the above-mentioned Figure of 8 turn

| | | | | | |
|----|---------|---------|---------|------|------------|
| | 1.0687 | -0.0203 | -0.1826 | | 7907.3411 |
| B= | -0.0110 | 1.0494 | -0.1402 | Hbp= | 14307.3874 |
| | 0.0016 | 0.1056 | 0.7777 | | 5836.0587 |

Note

- (1) File naming rule: Cruise ID_corr.stcm
- (2) Sampling rate: 10 seconds
- (3) Geodetic system: WGS84
- (4) If you would like the raw data set, please contact us from "Contact Us" above.

Related Information



KM17-04
 Ship Name: KAIMEI
 Period: 2017-05-04 - 2017-05-10
 Chief Scientist: Katsuhisa Maeno (JAMSTEC)

[Enlarge Image](#)

Update History

| | |
|------------|-------------------------------------|
| 2019-06-12 | An observation data was registered. |
| 2018-06-29 | An observation data was registered. |
| 2018-03-21 | An observation data was registered. |
| 2018-02-09 | An observation data was registered. |

[Privacy Policy](#)
[Application for Data and Samples](#)
[Data Policy](#)
[What's New](#)
[Update History](#)
[Feeds](#)

[Amount of Public Info.](#)
Data
[Map Search](#)
[Data Tree](#)
[Detailed Search](#)

[KAIYO](#)
[YOKOSUKA](#)
[MIRAI](#)
[KAIREI](#)
[CHIKYU](#)
[KAIMEI](#)
[SHINSEI MARU](#)
[HAKUHO MARU](#)

[KAIKO](#)
[SHINKAI 2000](#)
[SHINKAI 6500](#)
[DEEP TOW](#)
[HYPER-DOLPHIN](#)
[URASHIMA](#)
[YOKOSUKA DEEP TOW](#)
[6K Camera DEEP TOW](#)
[6K Sonar DEEP TOW](#)
[KM-ROV](#)
[POWER GRAB SAMPLER \(SHELL\)](#)
[POWER GRAB SAMPLER \(CLOW\)](#)
[BMS](#)

Cruise ID:

Go to a Dive Information

Dive ID:

Copyright 2011 Japan Agency for Marine-Earth Science and Technology



JAMSTEC 国立研究開発法人
海洋研究開発機構
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

KAIMEI KM17-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-12

[ReadMe](#) [Observation Data](#) [Data Format](#)

Cruise ID: [KM17-04](#)

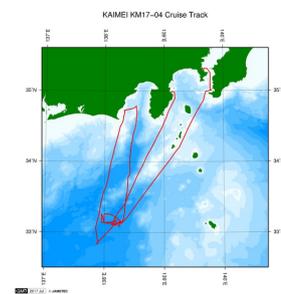
Shipboard Three Component Magnetometer (STCM): Processed (DMO)-Corrected

Data Policy: [JAMSTEC](#)

STCM 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. Negative for the southern hemisphere. |
| 4 | 27 -36 | Longitude | f10.5 | degree | No sign for eastern hemisphere. Negative for the western hemisphere. |
| 5 | 38 -43 | X component of geomagnetic field anomaly | f6.0 | nT | Positive on the north |
| 6 | 45 -50 | Y component of geomagnetic field anomaly | f6.0 | nT | Positive on the east |
| 7 | 52 -57 | Z component of geomagnetic field anomaly | f6.0 | nT | Positive for downward |
| 8 | 59 -64 | Absolute value of geomagnetic field anomaly | f6.0 | nT | |

Related Information



KM17-04

Ship Name: KAIMEI

Period: 2017-05-04 - 2017-05-10

Chief Scientist: Katsuhisa Maeno (JAMSTEC)

[Enlarge Image](#)

Update History

| | |
|------------|------------------------------------|
| 2019-06-12 | An observation data was registerd. |
| 2018-06-29 | An observation data was registerd. |
| 2018-03-21 | An observation data was registerd. |
| 2018-02-09 | An observation data was registerd. |

JAMSTEC

[Site Policy](#)
[Privacy Policy](#)
[Application for Data and Samples](#)
[Data Policy](#)

[What's New](#)
[Update History](#)
[Feeds](#)

[Lists](#)
[Publication List](#)
[Amount of Public Info.](#)

[Data](#)
[Map Search](#)
[Data Tree](#)
[Detailed Search](#)

Information of the Ships

NATSUSHIMA
KAIYO
YOKOSUKA
MIRAI
KAIREI
CHIKYU
KAIMEI
SHINSEI MARU
HAKUHO MARU

Information of the Submersibles

KAIKO
SHINKAI 2000
SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

Go to a Cruise Information

Cruise ID:

Go to a Dive Information

Dive ID:

KAIMEI KM17-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-12

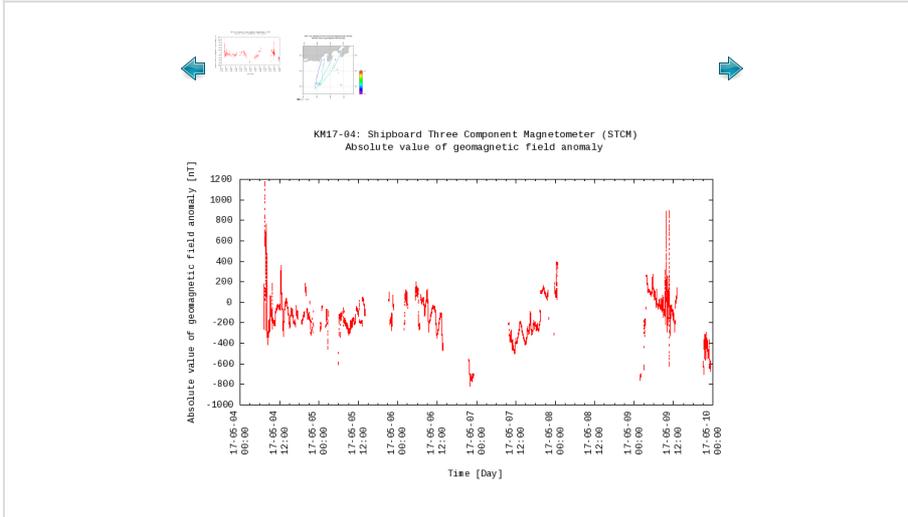
[ReadMe](#) [Observation Data](#) [Data Format](#)

Cruise ID: **KM17-04**
 Shipboard Three Component Magnetometer (STCM): Processed (DMO)-Corrected
 Data Policy: **JAMSTEC**
 Observation Items: X, Y and Z component of geomagnetic field anomaly, Absolute value of geomagnetic field anomaly
 Science Keywords:
 OCEANS > MARINE GEOPHYSICS > MARINE MAGNETICS
 SOLID EARTH > GEOMAGNETISM

Observation Map



Figures

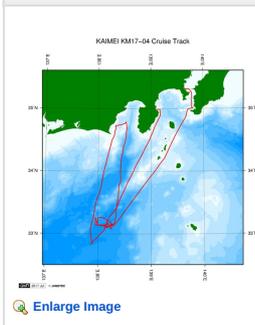


Data List

File names

KM17-04_corr.stcm

Related Information



KM17-04
 Ship Name: KAIMEI
 Period: 2017-05-04 - 2017-05-10
 Chief Scientist: Katsuhisa Maeno (JAMSTEC)

Update History

| | |
|------------|-------------------------------------|
| 2019-06-12 | An observation data was registered. |
| 2018-06-29 | An observation data was registered. |
| 2018-03-21 | An observation data was registered. |
| 2018-02-09 | An observation data was registered. |

[Site Policy](#)
[Privacy Policy](#)
[Application for Data and Samples](#)
[Data Policy](#)
[What's New](#)
[Update History](#)
[Feeds](#)

[Publication List](#)
[Amount of Public Info.](#)
[Data](#)
[Map Search](#)
[Data Tree](#)
[Detailed Search](#)

[NATSUSHIMA](#)
[KAIYO](#)
[YOKOSUKA](#)
[MIRAI](#)
[KAIREI](#)
[CHIKYU](#)
[KAIMEI](#)
[SHINSEI MARU](#)
[HAKUHO MARU](#)

[Submersibles](#)
[KAIKO](#)
[SHINKAI 2000](#)
[SHINKAI 6500](#)
[DEEP TOW](#)
[HYPER-DOLPHIN](#)
[URASHIMA](#)
[YOKOSUKA DEEP TOW](#)
[6K Camera DEEP TOW](#)
[6K Sonar DEEP TOW](#)
[KM-ROV](#)
[POWER GRAB SAMPLER \(SHELL\)](#)
[POWER GRAB SAMPLER \(CLOW\)](#)
[BMS](#)

Cruise ID:

[Go to a Dive Information](#)

Dive ID:

Copyright 2011 Japan Agency for Marine-Earth Science and Technology



JAMSTEC

国立研究開発法人
海洋研究開発機構

JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY