

KAIREI KR11-05 Leg2 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-19

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

Cruise ID: [KR11-05 Leg2](#)

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

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/KR11-05_leg2_all.pdf

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)

2011-03-14 08:07 – 2011-03-31 00:17

Instrument

Instrument:

3 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 (see section 4.). As a quality control, data of low reliability was removed (see section 5. for quality control criteria).

Synthetic geomagnetic field values were calculated from IGRF models.

Measurement System

(1) Magnetometer

Manufacturer : Tierra Technica Ltd.
Type : SFG1214
Measurement range : $\pm 100,000$ nT
Accuracy : less than 100 nT
Resolution : 1 nT
Location : No.2 Laboratory (Dry 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 : OCTANS
Measurement range : ± 180 degree(Roll), ± 90 degree(Pitch), 0 to +360 degree(Gyro)
Accuracy(Roll, Pitch) : 0.01 degree
Accuracy(Gyro) : 0.05 degree *Secant(Lat.)
Location : Tank top(on the bottom of ship)

Duration of the Figure of 8 turn

In KR11-03 cruise

Date (UTC)

2011/02/09 22:17:00 - 2011/02/09 22:42:00

2011/02/10 02:40:01 - 2011/02/10 03:01:00

2011/02/12 00:29:00 - 2011/02/12 00:51:00

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 11th 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

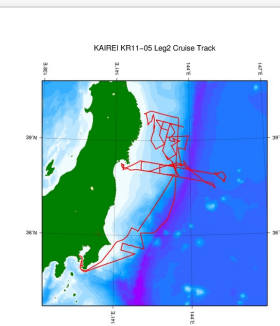
This coefficient was calculated from the Figure of 8 turn (see section 4.)

| | | | | | |
|----|---------|---------|---------|------|------------|
| | 1.0943 | 0.0999 | 0.0222 | | -3251.7403 |
| B= | -0.0980 | 1.3033 | -0.0129 | Hbp= | -5992.1061 |
| | -0.0258 | -0.0032 | 0.8190 | | -4883.7753 |

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



KR11-05 Leg2

Ship Name: KAIREI

Period: 2011-03-14 - 2011-03-31

Chief Scientist: Yuka Kaiho (JAMSTEC)

Project Name: [Seismic study]

Proposal Urgent study of the 2011 off the Pacific coast of Tohoku Earthquake

Title:

[Enlarge Image](#)

Update History

- | | |
|------------|------------------------------------|
| 2019-06-19 | An observation data was registerd. |
| 2018-03-14 | An observation data was registerd. |

2014-09-23
2012-09-28

An observation data was registerd.
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:

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

KAIREI KR11-05 Leg2 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-19

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

Cruise ID: [KR11-05 Leg2](#)

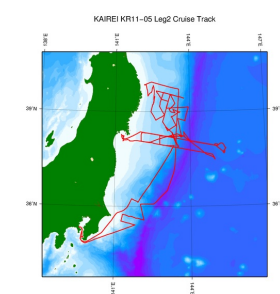
Shipboard Three Component Magnetometer (STCM): Processed (DMO)-Corrected

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



[Enlarge Image](#)

KR11-05 Leg2

Ship Name: KAIKEI

Period: 2011-03-14 - 2011-03-31

Chief Scientist: Yuka Kaiho (JAMSTEC)

Project Name: [Seismic study]

Proposal Urgent study of the 2011 off the Pacific coast of Tohoku Earthquake

Title:

Update History

| | |
|------------|------------------------------------|
| 2019-06-19 | An observation data was registerd. |
| 2018-03-14 | An observation data was registerd. |
| 2014-09-23 | An observation data was registerd. |
| 2012-09-28 | 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

[KAICO](#)
[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:

KAIREI KR11-05 Leg2 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-19

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

Cruise ID: **KR11-05 Leg2**

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

Data Policy: **JAMSTEC**

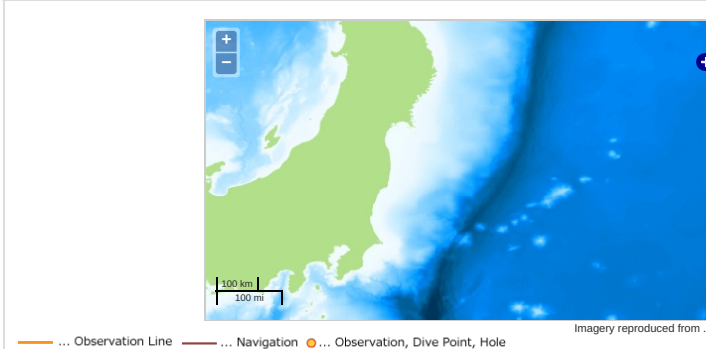
Observation Items: X, Y and Z component of geomagnetic field anomaly, Absolute value of geomagnetic field anomaly

Science Keywords:

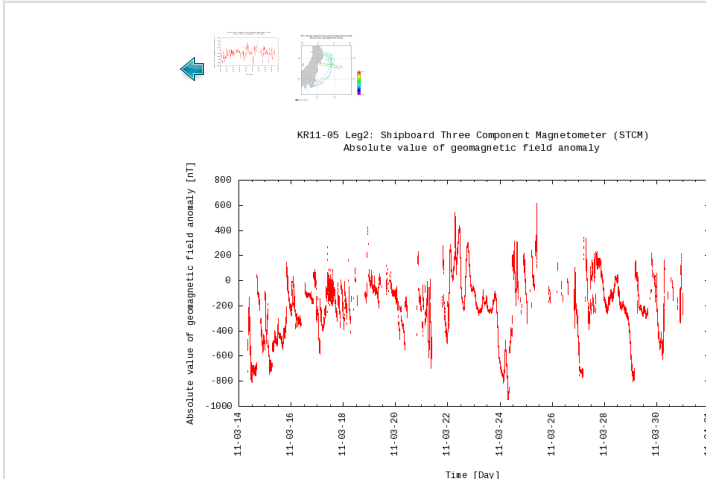
OCEANS > MARINE GEOPHYSICS > MARINE
MAGNETICS

SOLID EARTH > GEOMAGNETISM

Observation Map



Figures



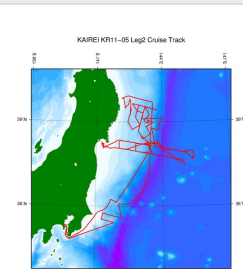
Data List

[Add to Basket](#)

File names

☐ KR11-05_leg2_corr.stcm

Related Information



[Enlarge Image](#)

KR11-05 Leg2

Ship Name: KAIREI

Period: 2011-03-14 - 2011-03-31

Chief Scientist: Yuka Kaiho (JAMSTEC)

Project Name: [Seismic study]

Proposal: Urgent study of the 2011 off the Pacific coast of Tohoku Earthquake

Title:

Update History

| | |
|------------|-------------------------------------|
| 2019-06-19 | An observation data was registered. |
| 2018-03-14 | An observation data was registered. |
| 2014-09-23 | An observation data was registered. |
| 2012-09-28 | An observation data was registered. |

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:

