

KAIREI KR98-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-21

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

Cruise ID: [KR98-04](#)

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

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/KR98-04_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)

1998-04-16 06:56 – 2018-05-04 12:01

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

Manufacturer : Tierra Technica Ltd.
Type : TVM-4
Measurement range : ± 45 degree
Accuracy : ± 0.2 degree (<30 degree)
Resolution : 0.0055 degree / LSB
Location : Gravimeter Room

(4) Gyro compass

Manufacturer : Yokogawa Denshikiki Co.,Ltd.
Type : CMZ500
Follow-Up Speed : 12 degree / sec
Accuracy : ± 0.2 degree *Secant(Lat.)
Location : Bridge deck

Direction of the Figure of 8 turn

Duration of the Figure of 8 turn

In KR98-04 cruise
Date (UTC)
1998/04/16 16:52:19 - 1998/04/16 17:15:00
1998/04/18 19:25:01 - 1998/04/18 19:53:59
1998/04/30 05:24:00 - 1998/04/30 05:37:00
1998/05/04 07:13:00 - 1998/05/04 07:30:00

Data processing

The following corrections and calculations were performed.

- (1) Ship magnetization correction
Hob = ARPYF + Hp ---(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 ---(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 ±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

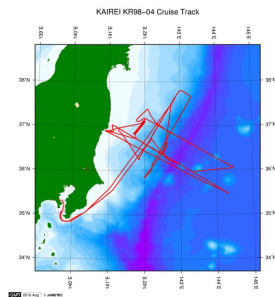
This coefficient was calculated from the Figure of 8 turn (see section 4.)

	1.0925	0.1044	0.0118		-3585.9524
B=	-0.1120	1.3051	0.0718	Hbp=	-11651.5026
	-0.0316	0.0056	0.9376		-12229.4042

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



 [Enlarge Image](#)

KR98-04

Ship Name: KAI REI
Period: 1998-04-16 - 1998-05-04
Chief Scientist: Tetsuro Tsuru (JAMSTEC)
Project Name: [Seismic study]

Update History

2019-06-21	An observation data was registered.
2018-05-26	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:

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 KR98-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-21

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

Cruise ID: [KR98-04](#)

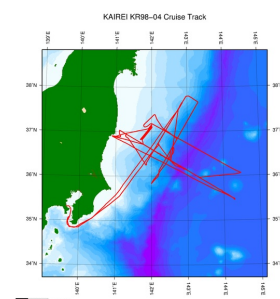
Shipboard Three Component Magnetometer (STCM): Processed (DMO)-Corrected

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



[Enlarge Image](#)

KR98-04

Ship Name: KAIKEI
Period: 1998-04-16 - 1998-05-04
Chief Scientist: Tetsuro Tsuru (JAMSTEC)
Project Name: [Seismic study]

Update History

2019-06-21	An observation data was registered.
2018-05-26	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:

KAIREI KR98-04 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-21

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

Cruise ID: **KR98-04**

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

Data Policy: **JAMSTEC**

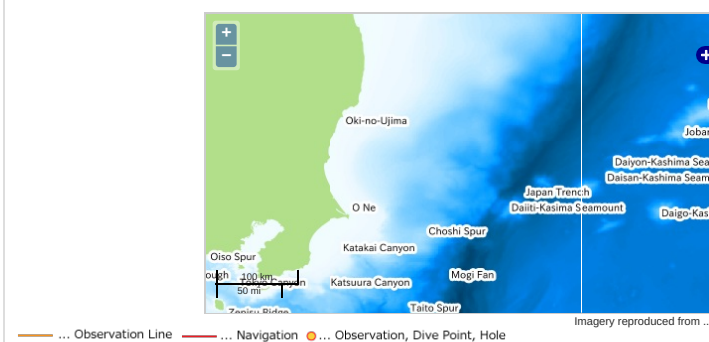
Observation Items: X, Y and Z component of geomagnetic field anomaly, Absolute value of geomagnetic field anomaly

Science Keywords:

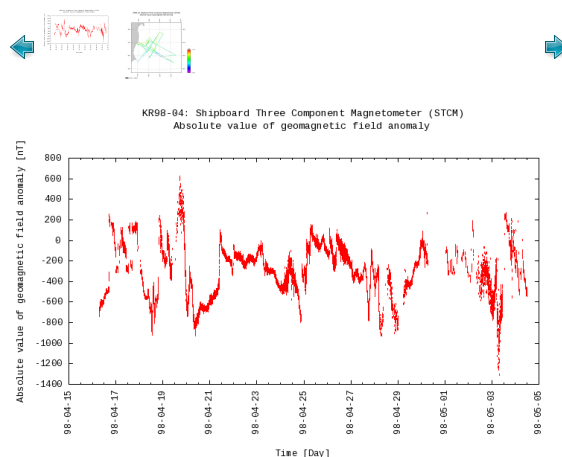
OCEANS > MARINE GEOPHYSICS > MARINE
MAGNETICS

SOLID EARTH > GEOMAGNETISM

Observation Map



Figures



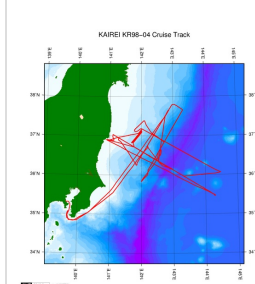
Data List

[Add to Basket](#)

File names

☐ KR98-04_corr.stcm

Related Information



[Enlarge Image](#)

KR98-04

Ship Name: KAIKEI
Period: 1998-04-16 - 1998-05-04
Chief Scientist: Tetsuro Tsuru (JAMSTEC)
Project Name: [Seismic study]

Update History

2019-06-21 An observation data was registered.
2018-05-26 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](#)

[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