

## YOKOSUKA YK02-07 Leg1 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-18

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

Cruise ID: [YK02-07 Leg1](#)

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

Data Policy: [JAMSTEC](#)

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

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)

2002-10-07 11:14 – 2002-10-18 14:41

### 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 : SFG1212

Measurement range :  $\pm 100,000$  nT

Accuracy : less than 100 nT

Resolution : 1 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

Manufacturer : OKI

Measurement range : 15 degree

Accuracy :  $\pm 0.2$  degree

#### (4) Gyro compass

Manufacturer : TOKIMEC INC.

Type : ES-110

Follow-Up Speed : 24 degree / sec

Accuracy :  $\pm 1.0$  degree \*Secant(Lat.)

Location : No.1 Laboratory

### Duration of the Figure of 8 turn

On this cruise

Date (UTC)

2002/10/13 10:10:00 - 2002/10/13 10:23:00

### Data processing

The following operations and calculations were performed

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 above)

B=	1.0840	0.0491	-0.0991	-4229.6120
	-0.0510	1.1828	-0.1963	-1463.8333
	-0.0020	0.0686	0.4807	-14259.9819

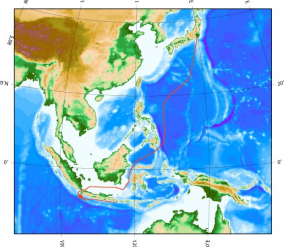
**Note**

- (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**

☒ Cruise Data ☐ Dive Data

YOKOSUKA YK02-07 Leg1 Cruise Track



[Enlarge Image](#)

**YK02-07 Leg1**

Ship Name: YOKOSUKA  
Period: 2002-09-25 - 2002-10-20  
Chief Scientist: Soh Wonn (JAMSTEC)

**Update History**

2019-06-18	An observation data was registerd.
2018-03-08	An observation data was registerd.
2014-09-10	An observation data was registerd.
2014-06-05	An observation data was registerd.

2012-12-25

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**  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

国立研究開発法人  
海洋研究開発機構

## YOKOSUKA YK02-07 Leg1 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-18

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

Cruise ID: [YK02-07 Leg1](#)

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

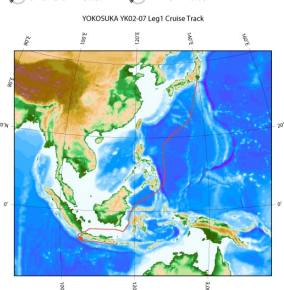
Data Policy: [JAMSTEC](#)

### 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

☒ Cruise Data ☐ Dive Data



[Enlarge Image](#)

#### YK02-07 Leg1

Ship Name: YOKOSUKA  
Period: 2002-09-25 - 2002-10-20  
Chief Scientist: Soh Wonn (JAMSTEC)

### Update History

2019-06-18	An observation data was registerd.
2018-03-08	An observation data was registerd.
2014-09-10	An observation data was registerd.
2014-06-05	An observation data was registerd.
2012-12-25	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:

## YOKOSUKA YK02-07 Leg1 Shipboard Three Component Magnetometer (STCM)

Last Modified: 2019-06-18

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

Cruise ID: [YK02-07 Leg1](#)

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

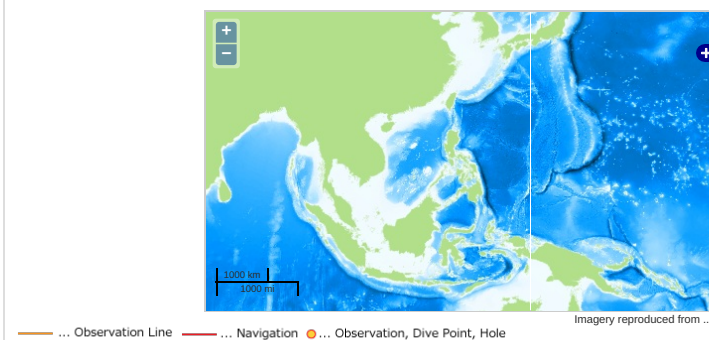
Data Policy: [JAMSTEC](#)

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

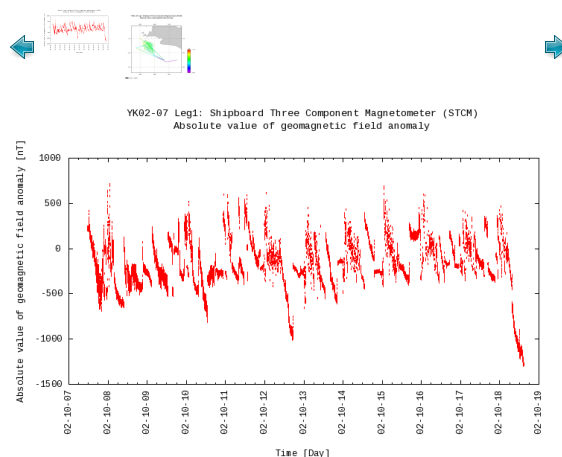
Science Keywords:

OCEANS > MARINE GEOPHYSICS > MARINE MAGNETICS  
SOLID EARTH > GEOMAGNETISM

### Observation Map



### Figures



### Data List

[Add to Basket](#)

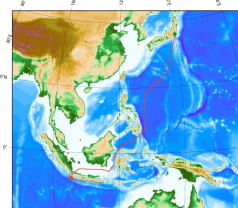
File names

☐ YK02-07\_leg1\_corr.stcm

### Related Information

[Cruise Data](#) [Dive Data](#)

YOKOSUKA YK02-07 Leg1 Cruise Track



[Enlarge Image](#)

[YK02-07 Leg1](#)

Ship Name: YOKOSUKA

Period: 2002-09-25 - 2002-10-20

Chief Scientist: Soh Wonn (JAMSTEC)

### Update History

2019-06-18	An observation data was registered.
2018-03-08	An observation data was registered.
2014-09-10	An observation data was registered.
2014-06-05	An observation data was registered.
2012-12-25	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:

