

## MIRAI MR12-E02 Leg1 Total Magnetic Intensity (TMI)

Last Modified: 2019-06-26

ReadMe Observation Data Data Format

Cruise ID: [MR12-E02 Leg1](#)

Total Magnetic Intensity (TMI): Processed (DMO)-Corrected

Data Policy: [JAMSTEC](#)

Observation Items: Total magnetic field intensity

Science Keywords:

OCEANS > MARINE GEOPHYSICS > MARINE  
MAGNETICS  
SOLID EARTH > GEOMAGNETISM

Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR12-E02\\_leg1\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR12-E02_leg1_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.

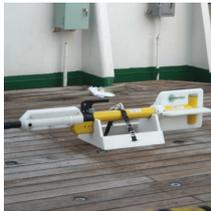
### Period (UTC)

2012-03-12 21:58 – 2012-03-13 21:45

### Instrument

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 section 5. for quality control criteria). Synthetic geomagnetic field values were calculated from IGRF models.

### Measurement System

Manufacturer : Geometrics, inc.

Type : G-882

Measurement range : 20,000 - 100,000 nT

Resolution : 0.002 nT

Accuracy : less than 2 nT

Location : Dry Laboratory

### Data processing

The following corrections and calculations were performed.

#### (1) 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>]

#### (2) Calculation of the geomagnetic field anomaly

$A_n = F - F_{igrf}$

$A_n$ : Total geomagnetic field intensity anomaly

$F$ : Observed total geomagnetic field intensity

$F_{igrf}$ : 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:

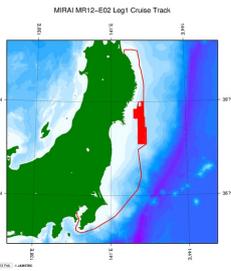
- Time error (inversion of time, continuation of same timestamps)
- Ground speed of the ship below 1knot or exceeding 20knot
- Total geomagnetic field intensity anomaly exceeding  $\pm 4000$ nT
- Spatial gradient of the total geomagnetic field intensity anomaly exceeding  $\pm 300$ nT/km

### 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 us from "Contact Us" above.

## Related Information

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



[Enlarge Image](#)

### MR12-E02 Leg1

Ship Name: MIRAI

Period: 2012-03-05 - 2012-03-15

Chief Scientist: Takafumi Kasaya (JAMSTEC)

Project Name: [Tohoku Ecosystem-Associated Marine Sciences (TEAMS)]

Proposal Title: Marine Ecosystems Investigation, Impact by the mega-earthquake (the 2011 Earthquake of the Pacific coast of Tohoku) and Tsunami: For Recover and Rebuild of Sanriku Fisheries Activities

## Update History

2019-06-26	An observation data was registered.
2018-06-29	An observation data was registered.
2018-05-12	An observation data was registered.
2014-03-31	An observation data was registered.
2013-07-18	An observation data was registered.

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[SHINKAI 2000](#)

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[DEEP TOW](#)

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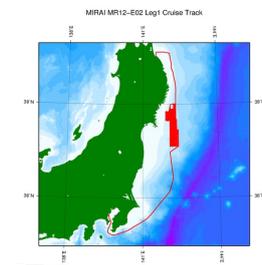
Data Policy: [JAMSTEC](#)

### 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. Negative for the southern hemisphere.
4	27 -36	Longitude	f10.5	degree	No sign for eastern hemisphere. Negative for the western hemisphere.
5	38 -45	Observed total geomagnetic field intensity	f8.1	nT	
6	46 -53	Total geomagnetic field intensity anomaly	f7.1	nT	

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[Enlarge Image](#)

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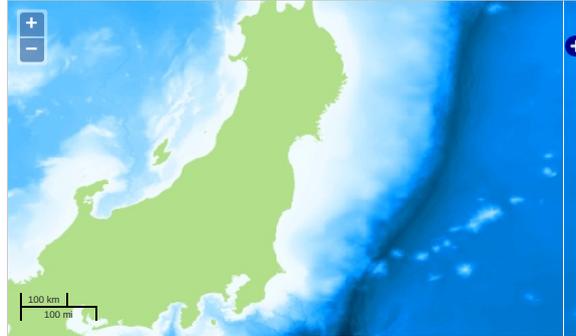
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### Observation Map



Imagery reproduced from ...

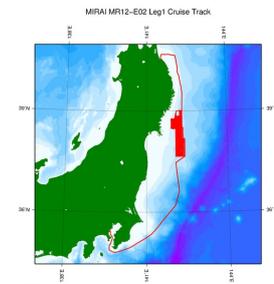
### Data List

#### File names

MR12-E02\_leg1\_corr.tmag

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