

## MIRAI MR02-K01 Gravity

Last Modified: 2019-07-26

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

Cruise ID: [MR02-K01](#)

Gravity: Processed (DMO)-Basic

Data Policy: [JAMSTEC](#)

Observation Items: Absolute gravity

Science Keywords:

OCEANS > MARINE GEOPHYSICS > MARINE GRAVITY FIELD  
SOLID EARTH > GEODETICS/GRAVITY > GRAVITY

### Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR02-K01\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR02-K01_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)

2002-01-07 01:00 – 2002-02-15 23:30

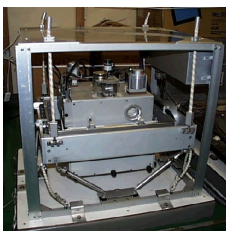
### Instrument

Instrument:

Shipboard gravimeter

Instrument:

Microgravimeter ( - MR11-05 Leg2)



### Overview

The data provided here are absolute gravity data. The absolute gravity data are a combination of relative gravity data measured by the shipboard gravity meter and the absolute gravity data of the ports in departure and arrival. Drift corrections were done before converting into absolute gravity. The absolute gravity values of the ports are referenced to those of the Japan Gravity Standardization Net of the Geographical Survey Institute of Japan.

### Measurement System

#### (1) Shipboard gravity meter

The system consists of two main assemblies; the gyro-stabilized platform including the gravity sensor and the data handling & control system.

Manufacturer : LaCoste & Romberg  
Model : S-116  
Measuring range : 12,000 mGal  
Accuracy : 1.0 mGal  
Drift rate : < 3.0 mGal/month  
Installation : Gravity meter room

Reference: 「Model "S" Air-Sea Dynamic Gravity Meter SystemII」 INSTRUCTION MANUAL LaCoste and Romberg Gravity Meters, Inc. 2004

#### (2) Portable gravity meter

The portable gravity meter consists of two modules; the data acquisition/control module and the gravity sensor module. The gravity sensor is enclosed in a thermostatically controlled vacuum chamber. The portable gravity meter is used to calculate the absolute gravity of the port with reference to the gravity station of the Japan Gravity Standardization Net of the Geographical Survey Institute of Japan.

Manufacturer : SCINTREX  
Model : CG-3M  
Measurement range : 7,000 mGal  
Standard deviation : 0.05 mGal  
Drift rate : < 0.02 mGal/day

Reference: "CG-3M AUTOGRAV AUTOMATED GRAVITY METER OPERATOR MANUAL", SCINTREX

### Absolute gravity in Ports

Date (UTC)	Port	Absolute gravity (mGal)	Sea level (cm)	Draft shipboard (cm)	Absolute gravity at sensor position (mGal)	Reading of shipboard gravity meter (mGal)
2001/07/19 05:06:00	SEKINEHAMA	980371.85	233	600	980372.60	12658.5
2002/03/31 03:43:00	SEKINEHAMA	980371.84	326	589	980372.87	12666.2

\* see [Term description](#)

### Data processing

According to the filter process of the gravity meter system, the gravity data has a time lag of 300 seconds between the measurement and its output. After adjustment of this lag time, the following corrections and calculations were performed.

#### (1) Drift correction

$$D = ((Vge - Vgs) - (Age - Ags)) / (Te - Ts)$$

D: Drift value (mGal/day)  
Vgs: The shipboard gravity at the start of the cruise (mGal)  
Vge: The shipboard gravity at the end of the cruise (mGal)  
Ags: The absolute gravity at the shipboard sensor position at the start of the cruise (mGal)  
Age: The absolute gravity at the shipboard sensor position at the end of the cruise (mGal)  
Ts: The start time of the cruise (day)  
Te: The end time of the cruise (day)

(2) Calculation of the absolute gravity

$$G = Ags + (Vg - Vgs) - D \cdot (T - Ts) + E + H \cdot \beta$$

G: The absolute gravity at sea surface (mGal)  
Ags: The absolute gravity at the shipboard sensor position at the start of the cruise (mGal)  
Vgs: The shipboard gravity at the start of the cruise (mGal)  
Vg: The shipboard gravity at the measurement time (mGal)  
D: Drift value (mGal/day)  
Ts: The start time of the cruise (day)  
T: The measurement time (day)  
E: Eotvos correction (mGal)  
H: Height from sea surface of the shipboard sensor position (m)  
 $\beta$ : Free-air gradient 0.3086 (mGal/m)

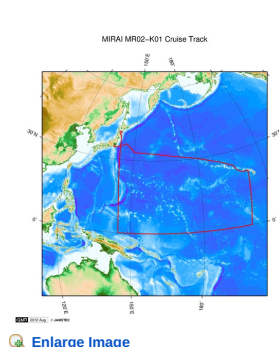
(3) Output of the data

Time (UTC)  
Latitude (degree)  
Longitude (degree)  
Processed absolute gravity (mGal)  
Depth (m)

Note

- (1) File naming rule: Cruise ID\_p.grv
- (2) Sampling rate: ten seconds
- (3) If you would like the raw data set, please contact us from "Contact Us" above.

Related Information



**MR02-K01**  
Ship Name: MIRAI  
Period: 2002-01-07 - 2002-02-15  
Chief Scientist: Takeshi Kawano (JAMSTEC)

Update History

2019-07-26	An observation data was registered.
2019-07-25	An observation data was registered.
2018-07-14	An observation data was registered.
2012-12-25	An observation data was registered.

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Information of the Ships

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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:



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Cruise ID: [MR02-K01](#)

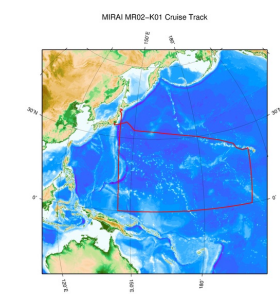
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Data Policy: [JAMSTEC](#)

### Gravity Processed

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	Latitude (degree) ; positive in north, negative in south
4	27 -36	Longitude	f10.5	degree	Longitude (degree) ; positive in east, negative in west
5	39 -46	Gravity	f8.1	mGal	
6	48 -52	Depth	i5	m	

### Related Information



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#### MR02-K01

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Period: 2002-01-07 - 2002-02-15

Chief Scientist: Takeshi Kawano (JAMSTEC)

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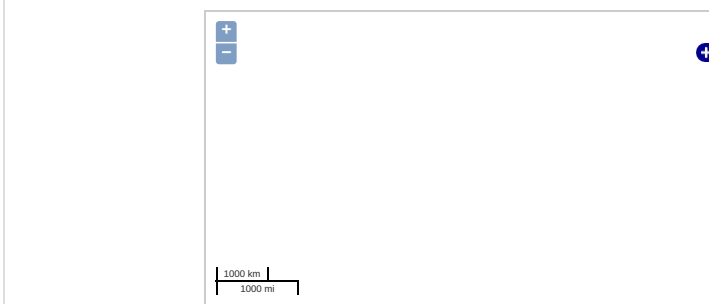
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Observation Items: Absolute gravity

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### Observation Map



— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Imagery reproduced from ...

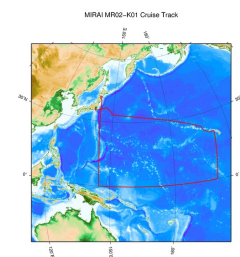
### Data List

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File names

☐ MR02-K01\_p.grv

### Related Information



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Period: 2002-01-07 - 2002-02-15

Chief Scientist: Takeshi Kawano (JAMSTEC)

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