

MIRAI MR02-K02 Gravity

Last Modified: 2019-07-26

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Cruise ID: [MR02-K02](#)

Gravity: Processed (DMO)-Basic

Data Policy: [JAMSTEC](#)

Observation Items: Absolute gravity

Science Keywords:

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

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)

2002-02-21 05:00 – 2002-03-22 19:46

2002-03-24 23:12 – 2002-03-30 23:30

Instrument

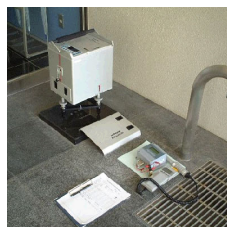
Instrument:

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

$$D = ((V_{ge} - V_{gs}) - (Age - Ags)) / (Te - Ts)$$

D: Drift value (mGal/day)

V_{gs}: The shipboard gravity at the start of the cruise (mGal)

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

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

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: Eotvoes correction (mGal)

H: Height from sea surface of the shipboard sensor position (m)

β : Free-air gradient 0.3086 (mGal/m)

(3) Output of the data

Time (UTC)

Latitude (degree)

Longitude (degree)

Processed absolute gravity (mGal)

Depth (m)

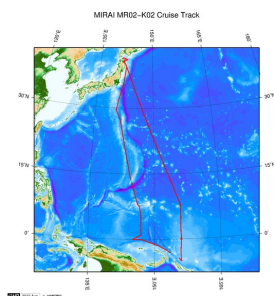
Note

(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



[Enlarge Image](#)

MR02-K02

Ship Name: MIRAI

Period: 2002-02-21 - 2002-03-30

Chief Scientist: Kentaro Ando (JAMSTEC)

Project Name: [Tropical Ocean Climate Study (TOCS)]

Update History

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

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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

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Cruise ID:

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Dive ID:



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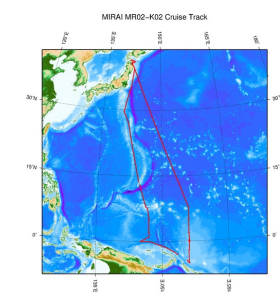
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Gravity Processed

| 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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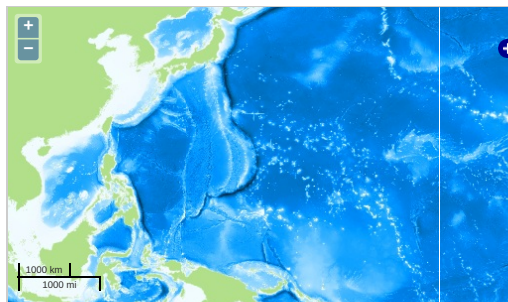
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Observation Map



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

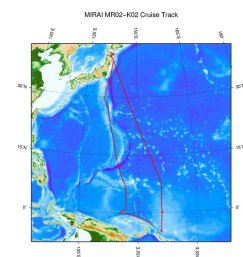
Imagery reproduced from ...

Data List

File names

☐ MR02-K02_p.grv

Related Information



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