

MIRAI MR02-K06 Leg4 Gravity

Last Modified: 2019-07-26

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Cruise ID: [MR02-K06 Leg4](#)

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-K06_leg3-4_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.

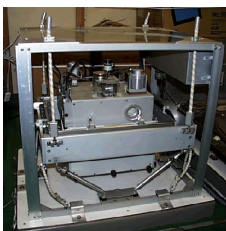
Period (UTC)

2003-02-02 11:30 – 2003-02-14 00:00

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)
2002/11/13 03:31:00	SEKINEHAMA	980371.85	225	625	980372.59	12660.7
2003/02/19 06:45:00	SEKINEHAMA	980371.85	238	605	980372.62	12665.0

* 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)
 β : Free-air gradient 0.3086 (mGal/m)

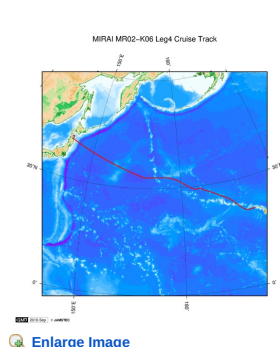
(3) Output of the data

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



MR02-K06 Leg4
 Ship Name: MIRAI
 Period: 2003-02-02 - 2003-02-14
 Chief Scientist: Kazuhiko Matsumoto (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.
2016-10-11	An observation data was registered.

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 Data Tree
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 KAIMEI
 SHINSEI MARU
 HAKUHO MARU

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 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)
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Dive ID:



MIRAI MR02-K06 Leg4 Gravity

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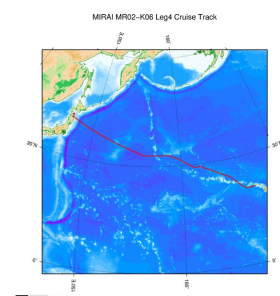
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Gravity Processed

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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MR02-K06 Leg4

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Period: 2003-02-02 - 2003-02-14

Chief Scientist: Kazuhiko Matsumoto (JAMSTEC)

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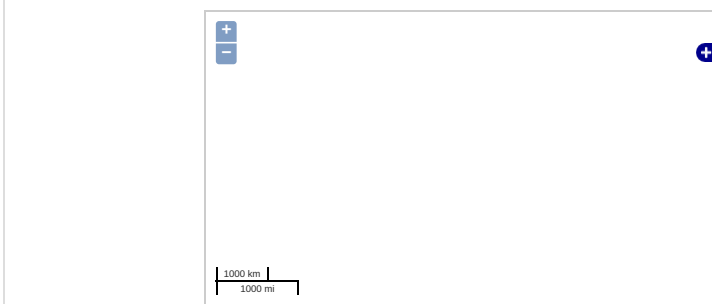
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Observation Map



Imagery reproduced from ...

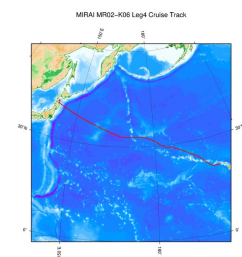
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Data List

File names

☐ MR02-K06_leg4_p.grv

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[Amount of Public Info.](#)

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