

KAIREI KR04-05 Gravity

Last Modified: 2019-07-09

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

Cruise ID: [KR04-05](#)

Gravity: Processed (DMO)-Corrected

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)

2004-05-06 01:17 – 2004-05-10 23:27

Instrument

Instrument:

Shipboard gravimeter (- KR16-07)



Instrument:

Microgravimeter (- KR07-18)



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 : BODENSEEWERK
Model : KSS 31
Measuring range : 10,000 mGal
Accuracy : 1.0 mGal
Drift rate : < 3.0 mGal/month
Installation : Gravity meter room

Reference: "INSTRUCTION MANUAL for MARINE/AIR GRAVITYMETER SYSTEM KSS 31", Bodenseewerk 1996

(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 : 0.01 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)
2004/05/05 22:30:44	YOKOSUKA/JAMSTEC	979758.33	235	450	979758.87	-1433.8
2004/05/11 00:29:58	YOKOSUKA/JAMSTEC	979758.34	234	440	979758.85	-1433.8

* see [Term description](#)

Data processing

According to the filter process of the gravity meter system, the gravity data has a time lag of 103 seconds between the measurement and its output. After adjustment of this lag time, the following corrections and calculations were performed.

(1) Drift correction

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

D: Drift value (mGal/day)

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

V_{ge}: The shipboard gravity at the end of the cruise (mGal)

Vg: 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: 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)

Quality control of data

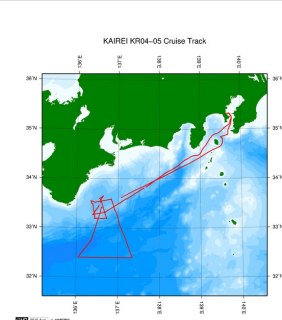
Following criteria were used for removal of low reliability data:

- Abrupt free-air anomaly change exceeding 10mGal/km
- Change in Eotvoes correction exceeding 3mGal/min
- Ground speed of the ship below 3knot

Note

- (1) File naming rule: Cruise ID_corr.grv
- (2) Sampling rate: ten seconds
- (3) Geodetic system: WGS84
- (4) If you would like the raw data set, please contact us from "Contact Us" above.

Related Information



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KR04-05

Ship Name: KAIKEI

Period: 2004-05-06 - 2004-05-10

Chief Scientist: Makoto Yamano (The University of Tokyo)

Update History

2019-07-09	An observation data was registered.
2014-09-23	An observation data was registered.
2014-01-29	An observation data was registered.
2012-11-25	An observation data was registered.

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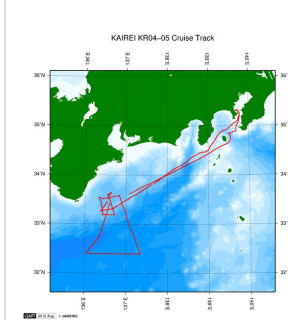
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Gravity Corrected

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	Absolute gravity	f8.1	mGal	
6	48 -53	Free-air anomaly	f6.1	mGal	

Related Information



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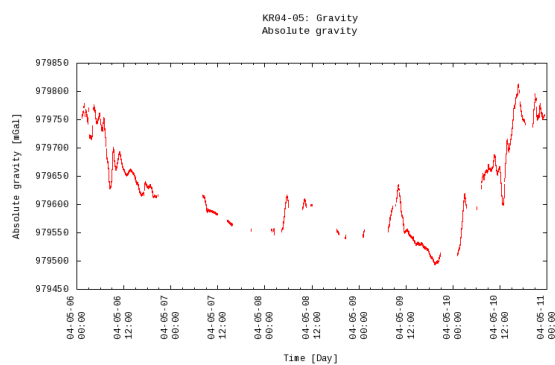
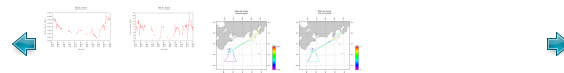
Observation Map



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

Imagery reproduced from ...

Figures



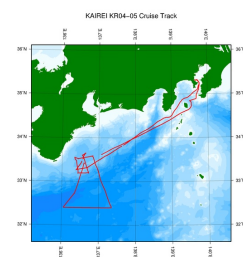
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File names

☐ KR04-05_corr.grv

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