

## KAIYO KY12-02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-07

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

Cruise ID: [KY12-02](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

OCEANS > SALINITY/DENSITY > SALINITY

### Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/KY12-02\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/KY12-02_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.

### Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

### System

#### (1) Launcher

Hand launcher

Manufacturer : Sippican, Inc.

Operation area : Rear upper deck

#### (2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.

Location : Investigation room

Sampling rate : 40 msec

#### (3) XCTD probe specifications

| Probe Type                      | TSK XCTD-1                                | TSK XCTD-2 | TSK XCTD-3 | TSK XCTD-4 |
|---------------------------------|---|------------|------------|------------|
| Temperature range [deg-C]       | -2 to 35                                  |            |            |            |
| Temperature accuracy [deg-C]    | +/- 0.02                                  |            |            |            |
| Temperature resolution [deg-C]  | 0.01                                      |            |            |            |
| Conductivity range [mS/cm]      | 0 to 60                                   |            |            |            |
| Conductivity accuracy [mS/cm]   | +/- 0.03                                  |            |            |            |
| Conductivity resolution [mS/cm] | 0.015                                     |            |            |            |
| Measurement depth [m]           | 1000                                      | 1850       | 1000       | 1850       |
| Depth accuracy [m]              | 5 or +/- 2% of depth; whichever is larger |            |            |            |
| Maximum elapsed time [sec]      | 300                                       | 600        | 200        | 502        |
| Rated ship speed [knot]         | 12  | 3.5        | 20         | 6          |

Since XCTD carries no pressure sensor, we need to estimate depth from the elapsed time. The fall-rate equation is as follows.

$$Z = at + 10E^{-3} \cdot bt^2$$

Where Z(m) is the depth and t(sec) is the elapsed time.

In addition, coefficients of the fall-rate equation are different by probe types.

| Probe Type    | TSK XCTD-1 | TSK XCTD-2 | TSK XCTD-3 | TSK XCTD-4 |
|---------------|------------|------------|------------|------------|
| Coefficient-a | 3.42543    | 3.43898    | 5.07598    | 3.68081    |
| Coefficient-b | -0.47      | -0.31      | -0.72      | -0.47      |

\* Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XCTD type used in each cast is as follows.

| Cast name         | Probe Serial No. | Probe Type | Launcher | Converter |
|-------------------|------------------|------------|----------|-----------|
| XCTD-015920120205 | -                | XCTD-2     | Hand     | MK-130    |
| XCTD-016020120206 | -                | XCTD-2     | Hand     | MK-130    |
| XCTD-016120120209 | -                | XCTD-2     | Hand     | MK-130    |
| XCTD-016220120210 | -                | XCTD-2     | Hand     | MK-130    |
| XCTD-016320120211 | -                | XCTD-2     | Hand     | MK-130    |

### Data processing

(1) For sensor's stability, values of less than 1 m for temperature and less than 3 m for salinity are replaced by missing values, respectively, based on

manufacturer's recommendation.

## (2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

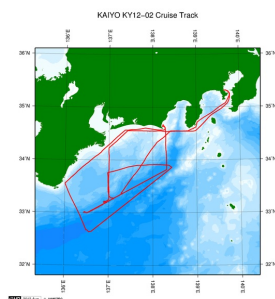
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

Please see the site of NODC of the following link for quality control procedure in detail.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

## Related Information



[Enlarge Image](#)

### KY12-02

Ship Name: KAIYO

Period: 2012-02-03 - 2012-02-12

Chief Scientist: Mikiya Yamashita (JAMSTEC)

Project Name: [Seismic study]

Proposal High resolution imaging of subducting sediments in Nankai Trough using seismic reflection survey

Title: survey

## Update History

|            |                                    |
|------------|------------------------------------|
| 2019-09-07 | An observation data was registerd. |
| 2017-06-14 | An observation data was registerd. |
| 2014-10-02 | An observation data was registerd. |
| 2014-04-12 | An observation data was registerd. |

### JAMSTEC

[Site Policy](#)  
[Privacy Policy](#)  
[Application for Data and Samples](#)  
[Data Policy](#)  
  
[What's New](#)  
[Update History](#)  
[Feeds](#)

### Lists

[Publication List](#)  
[Amount of Public Info.](#)  
  
**Data**  
[Map Search](#)  
[Data Tree](#)  
[Detailed Search](#)

### Information of the Ships

NATSUSHIMA  
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:

Copyright 2011 Japan Agency for Marine-Earth Science and Technology



**JAMSTEC**

国立研究開発法人  
海洋研究開発機構

JAPAN AGENCY FOR MARINE EARTH SCIENCE AND TECHNOLOGY

## KAIYO KY12-02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-07

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

 Cruise ID: [KY12-02](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

 Data Policy: [JAMSTEC](#)

### XCTD DMO

#### Format Description for the Corrected Data

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office). Please see the following link for details of Exchange Format.

[CCHDO | CLIVAR & Carbon Hydrographic Data Office](#)

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

#### Format Description for the QCed Data

Each data file contains one line header (meta data) followed by data lines for each cast.

The number of data lines are recorded in the header.

Header part

| No. | Column  | Content              | Format        | Remarks        |
|-----|---------|----------------------|---------------|----------------|
| 1   | 1       | Header ID            | a1            | fixed as '#'   |
| 2   | 3 - 6   | Data ID              | a4            | XCTD           |
| 3   | 8 - 22  | Cruise ID            | a15           |                |
| 4   | 33 - 40 | Date                 | i8            | YYYYMMDD (UTC) |
| 5   | 42 - 45 | Time                 | i4            | hhmm (UTC)     |
| 6   | 47 - 55 | Latitude             | i2,a1,f5.2,a1 | dd-mm.mmN(S)   |
| 7   | 57 - 66 | Longitude            | i3,a1,f5.2,a1 | ddd-mm.mmE(W)  |
| 8   | 68 - 71 | Number of data lines | i4            |                |
| 9   | 72 - 73 | Terminator           | -             | CR+LF          |

Data part

| No. | Column  | Content     | Unit  | Format | Remarks   |
|-----|---------|-------------|-------|--------|---|
| 1   | 1 - 11  | Depth       | m     | f11.1  |   |
| 2   | 12 - 22 | Temperature | deg-C | f11.2  | ITS-90  |
| 3   | 23 - 33 | Salinity    | PSU   | f11.3  | PSS-78  |
| 4   | 45 - 55 | Flag        | -     | i11    | 1 - 7 : space<br>8 : flag of depth<br>9 : flag of temperature<br>10 : flag of salinity<br>11 : space<br>* reference : <a href="#">Definition of Quality Control Flags</a> |
| 5   | 56 - 57 | Terminator  | -     | -      | CR+LF   |

Each contents of the data part is stored in 11 bytes.

Missing value is presented by '-5', and error value is presented by '-9'.

#### Definition of Quality Control Flags

##### 1. Depth Flags

- 0 - accepted value
- 1 - error in recorded depth ( same or less than previous depth )
- 2 - density inversion

##### 2. Observed Level Flags

- N - missing value
- 0 - accepted value
- 1 - range outlier ( outside of broad range check )
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range and gradient checks
- 8 - failed range and zero anomaly checks
- 9 - failed range and combined gradient and inversion checks
- A - failed visual check

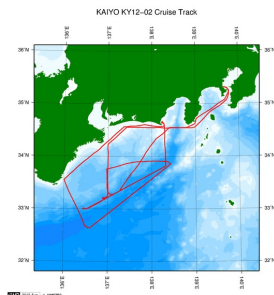
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



[Enlarge Image](#)

#### KY12-02

Ship Name: KAIYO

Period: 2012-02-03 - 2012-02-12

Chief Scientist: Mikiya Yamashita (JAMSTEC)

Project Name: [Seismic study]

Proposal High resolution imaging of subducting sediments in Nankai Trough using seismic reflection

Title: survey

#### Update History

|            |                                    |
|------------|------------------------------------|
| 2019-09-07 | An observation data was registerd. |
| 2017-06-14 | An observation data was registerd. |
| 2014-10-02 | An observation data was registerd. |
| 2014-04-12 | An observation data was registerd. |

#### JAMSTEC

[Site Policy](#)  
[Privacy Policy](#)  
[Application for Data and Samples](#)  
[Data Policy](#)  
**What's New**  
[Update History](#)  
[Feeds](#)

#### Lists

[Publication List](#)  
[Amount of Public Info.](#)  
**Data**  
[Map Search](#)  
[Data Tree](#)  
[Detailed Search](#)

#### Information of the Ships

[NATSUSHIMA](#)  
[KAIYO](#)  
[YOKOSUKA](#)  
[MIRAI](#)  
[KAIREI](#)  
[CHIKYU](#)  
[KAIMEI](#)  
[SHINSEI MARU](#)  
[HAKUHO MARU](#)

#### Information of the Submersibles

[KAICO](#)  
[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:

Copyright 2011 Japan Agency for Marine-Earth Science and Technology



**JAMSTEC** 国立研究開発法人  
海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

## KAIYO KY12-02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-07

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

Cruise ID: **KY12-02**  
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed  
Data Policy: **JAMSTEC**  
Observation Items: Depth, Temperature, Salinity  
Science Keywords:  
OCEANS > OCEAN > WATER  
TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

Observation Map

1. Clicking the icon displays a balloon with observation information.  
2. Then click the observation name, figures will be displayed.

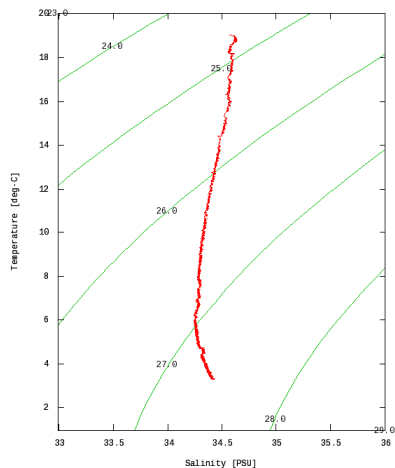


Figures

XCTD-015920120205



KY12-02: XCTD-015920120205  
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity



Data List

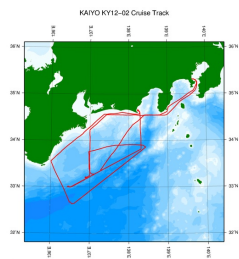
Add to Basket

| File names                  |
|-----------------------------|
| XCTD-015920120205.dat       |
| XCTD-016020120206.dat       |
| XCTD-016120120209.dat       |
| XCTD-016220120210.dat       |
| XCTD-016320120211.dat       |
| ex_read2.f (Sample Program) |

- Observation List  
The list of observation is shown as follows.

| Observation       | Time and Date    | Lat. [°] | Lon. [°] |
|-------------------|------------------|----------|----------|
| XCTD-015920120205 | 2012-02-05 05:21 | 33.1183  | 136.7743 |
| XCTD-016020120206 | 2012-02-06 02:45 | 33.8225  | 138.3153 |
| XCTD-016120120209 | 2012-02-09 23:13 | 33.5326  | 137.9355 |
| XCTD-016220120210 | 2012-02-10 10:01 | 33.8896  | 138.3873 |
| XCTD-016320120211 | 2012-02-11 04:54 | 33.3695  | 137.2786 |

Related Information



KAIYO KY12-02 Cruise Track

Enlarge Image

**KY12-02**  
Ship Name: KAIYO  
Period: 2012-02-03 - 2012-02-12  
Chief Scientist: Mikiya Yamashita (JAMSTEC)  
Project Name: [Seismic study]  
Proposal: High resolution imaging of subducting sediments in Nankai Trough using seismic reflection survey  
Title:

| Update History |                                    |
|----------------|------------------------------------|
| 2019-09-07     | An observation data was registerd. |
| 2017-06-14     | An observation data was registerd. |
| 2014-10-02     | An observation data was registerd. |
| 2014-04-12     | An observation data was registerd. |

JAMSTEC

Site Policy

Privacy Policy

Application for Data and Samples

Data Policy

What's New

Update History

Feeds

Lists

Publication List

Amount of Public Info.

Data

Map Search

Data Tree

Detailed Search

Information of the Ships

NATSUSHIMA

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

Go to a Dive Information

Dive ID:

Go

 **JAMSTEC** 国立研究開発法人 海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

Copyright 2011 Japan Agency for Marine-Earth Science and Technology