

KAIYO KY09-07 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-07

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

Cruise ID: [KY09-07](#)

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/KY09-07_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-000120090825	08069195	XCTD-1	Hand	-
XCTD-000220090825	08069196	XCTD-1	Hand	-
XCTD-000320090825	08069197	XCTD-1	Hand	-
XCTD-000420090825	08069198	XCTD-1	Hand	-
XCTD-000520090826	08069199	XCTD-1	Hand	-
XCTD-000620090826	08069200	XCTD-1	Hand	-
XCTD-000720090826	08069201	XCTD-1	Hand	-

XCTD-000820090829	09064581	XCTD-1	Hand	Converter
Cast name	Probe Serial No.	Probe Type	Launcher	
XCTD-000920090829	09064582	XCTD-1	Hand	-
XCTD-001020090829	08069202	XCTD-1	Hand	-
XCTD-001120090829	09064580	XCTD-1	Hand	-
XCTD-001220090829	09064579	XCTD-1	Hand	-
XCTD-001320090829	09064578	XCTD-1	Hand	-
XCTD-001420090903	09064583	XCTD-1	Hand	-
XCTD-001520090903	09064576	XCTD-1	Hand	-
XCTD-001620090903	09064575	XCTD-1	Hand	-
XCTD-001720090903	09064574	XCTD-1	Hand	-
XCTD-001820090903	09064573	XCTD-1	Hand	-
XCTD-001920090903	09064572	XCTD-1	Hand	-
XCTD-002020090903	09064577	XCTD-1	Hand	-
XCTD-002120090903	09064710	XCTD-1	Hand	-
XCTD-002220090903	09064711	XCTD-1	Hand	-
XCTD-002320090903	09064713	XCTD-1	Hand	-
XCTD-002420090904	09064714	XCTD-1	Hand	-
XCTD-002520090904	09064712	XCTD-1	Hand	-
XCTD-002820090904	09064717	XCTD-1	Hand	-
XCTD-002920090904	09064718	XCTD-1	Hand	-
XCTD-003020090904	09064719	XCTD-1	Hand	-
XCTD-003120090904	09064720	XCTD-1	Hand	-
XCTD-003220090904	09064721	XCTD-1	Hand	-
XCTD-003320090905	09064698	XCTD-1	Hand	-
XCTD-003420090905	09064699	XCTD-1	Hand	-
XCTD-003520090905	09064700	XCTD-1	Hand	-
XCTD-003620090905	09064701	XCTD-1	Hand	-
XCTD-003720090905	09064702	XCTD-1	Hand	-
XCTD-003820090905	09064703	XCTD-1	Hand	-
XCTD-003920090905	09064704	XCTD-1	Hand	-
XCTD-004020090905	09064706	XCTD-1	Hand	-
XCTD-004120090906	09064709	XCTD-1	Hand	-
XCTD-004220090906	09064708	XCTD-1	Hand	-
XCTD-004320090906	09064705	XCTD-1	Hand	-
XCTD-004420090906	09074916	XCTD-1	Hand	-
XCTD-004520090906	09074919	XCTD-1	Hand	-
XCTD-004620090906	09064707	XCTD-1	Hand	-
XCTD-004720090906	09074917	XCTD-1	Hand	-

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.

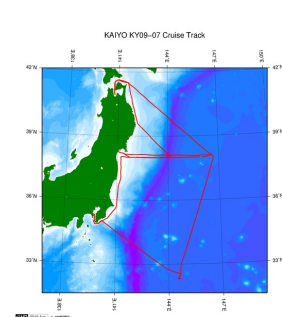
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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](#)

KY09-07

Ship Name: KAIYO
 Period: 2009-08-24 - 2009-09-07
 Chief Scientist: Yoshimi Kawai (JAMSTEC)
 Project Name: [Station KEO]
 Proposal Title: Observation Research on the Kuroshio Transport and Sea Surface Flux

Update History

2019-09-07	An observation data was registered.
2017-06-14	An observation data was registered.
2014-10-02	An observation data was registered.
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2012-09-28	An observation data was registered.

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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 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : Definition of Quality Control Flags
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

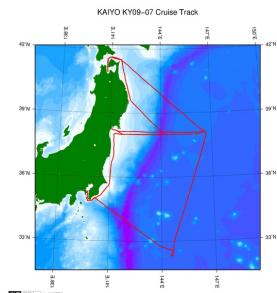
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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Period: 2009-08-24 - 2009-09-07

Chief Scientist: Yoshimi Kawai (JAMSTEC)

Project Name: [Station KEO]

Proposal Observation Research on the Kuroshio Transport and Sea Surface Flux

Title:

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Data Policy: **JAMSTEC**

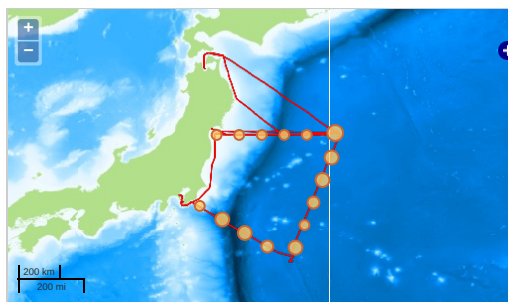
Observation Items: Depth, Temperature, Salinity

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.



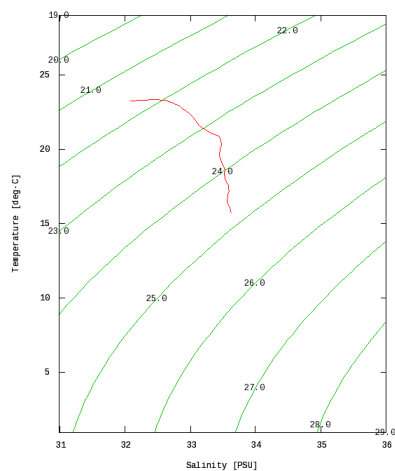
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

XCTD-000120090825



KY09-07: XCTD-000120090825
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity



































Only values evaluated as "good" : all flags are 0" are plotted in profiles.
Please see Format Page for the definition of quality flags.

Data List

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File names

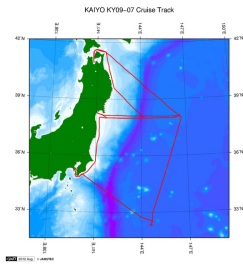
<input type="checkbox"/>	XCTD-000120090825.dat
<input type="checkbox"/>	XCTD-000220090825.dat
<input type="checkbox"/>	XCTD-000320090825.dat
<input type="checkbox"/>	XCTD-000420090825.dat
<input type="checkbox"/>	XCTD-000520090826.dat
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<input type="checkbox"/>	XCTD-000720090826.dat
<input type="checkbox"/>	XCTD-000820090829.dat
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<input type="checkbox"/>	XCTD-001120090829.dat
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<input type="checkbox"/>	XCTD-001420090903.dat

	Rider names20090903.dat
	XCTD-001620090903.dat
	XCTD-001720090903.dat
	XCTD-001820090903.dat
	XCTD-001920090903.dat
	XCTD-002020090903.dat
	XCTD-002120090903.dat
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	XCTD-002420090904.dat
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	XCTD-004320090906.dat
	XCTD-004420090906.dat
	XCTD-004520090906.dat
	XCTD-004620090906.dat
	XCTD-004720090906.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
XCTD-000120090825	2009-08-25 16:48	38.0001	141.2000
XCTD-000220090825	2009-08-25 19:04	37.9998	141.7000
XCTD-000320090825	2009-08-25 21:14	38.0000	142.1996
XCTD-000420090825	2009-08-25 23:15	38.0000	142.7003
XCTD-000520090826	2009-08-26 02:31	37.9985	143.2031
XCTD-000620090826	2009-08-26 04:29	38.0000	143.7000
XCTD-000720090826	2009-08-26 06:38	38.0000	144.2000
XCTD-000820090829	2009-08-29 03:32	38.0896	146.4621
XCTD-000920090829	2009-08-29 05:18	38.0000	146.2000
XCTD-001020090829	2009-08-29 07:29	38.0000	145.6996
XCTD-001120090829	2009-08-29 09:39	38.0000	145.1998
XCTD-001220090829	2009-08-29 11:48	38.0000	144.7000
XCTD-001320090829	2009-08-29 13:55	38.0000	144.2001
XCTD-001420090903	2009-09-03 06:00	37.9960	146.6973
XCTD-001520090903	2009-09-03 08:38	37.4998	146.5001
XCTD-001620090903	2009-09-03 11:35	37.0000	146.3001
XCTD-001720090903	2009-09-03 13:27	36.7501	146.1998
XCTD-001820090903	2009-09-03 15:16	36.5005	146.0986
XCTD-001920090903	2009-09-03 17:02	36.2506	145.9996
XCTD-002020090903	2009-09-03 18:48	36.0001	145.9000
XCTD-002120090903	2009-09-03 20:30	35.7498	145.8000
XCTD-002220090903	2009-09-03 22:15	35.5000	145.7000
XCTD-002320090903	2009-09-03 23:53	35.2498	145.5998
XCTD-002420090904	2009-09-04 01:24	34.9998	145.4998
XCTD-002520090904	2009-09-04 02:51	34.7498	145.4000
XCTD-002820090904	2009-09-04 05:48	34.2496	145.1998
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XCTD-003020090904	2009-09-04 09:59	33.4998	144.9000
XCTD-003120090904	2009-09-04 12:43	32.9998	144.6998
XCTD-003220090904	2009-09-04 16:27	32.3166	144.5416
XCTD-003320090905	2009-09-05 09:21	32.5379	144.6603
XCTD-003420090905	2009-09-05 12:28	32.7503	143.9491
XCTD-003520090905	2009-09-05 15:04	33.0498	143.4503
XCTD-003620090905	2009-09-05 17:48	33.3500	142.9501
XCTD-003720090905	2009-09-05 19:12	33.5000	142.7001
XCTD-003820090905	2009-09-05 20:35	33.6500	142.4500
XCTD-003920090905	2009-09-05 21:59	33.8001	142.2000
XCTD-004020090905	2009-09-05 23:23	33.9501	141.9498
XCTD-004120090906	2009-09-06 00:45	34.1003	141.7000
XCTD-004220090906	2009-09-06 02:07	34.2503	141.4500
XCTD-004320090906	2009-09-06 03:30	34.4000	141.2000
XCTD-004420090906	2009-09-06 04:52	34.5500	140.9500
XCTD-004520090906	2009-09-06 06:10	34.7000	140.7000
XCTD-004620090906	2009-09-06 07:31	34.8500	140.4498
XCTD-004720090906	2009-09-06 09:00	35.0000	140.2000

Related Information



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Chief Scientist: Yoshimi Kawai (JAMSTEC)

Project Name: [Station KEO]

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