## 5.24 Underway CTD

(1) Personnel

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## (2) Objective

The "Underway CTD" (UCTD) system measures vertical profiles of temperature, conductivity and pressure like traditional CTD system. The advantage of the UCTD system is to obtain good-quality CTD profiles from moving vessels with repeatable operation. In addition, the UCTD data are more accurate than those from XCTD because the sensor of the UCTD is basically same as that used in the traditional CTD system.

The purpose of UCTD observation in this cruise is to explore oceanic structure of temperature and salinity at the Makassar Strait, Lombok Strait and offshore Sumatran. The station locations is shown in Figure 5.24-1.



Figure 5.24-1:Research area of MR15-04

#### (3) Methods

The UCTD system, manufactured by Oceanscience Group, was utilized in this cruise. The system consists of the probe unit and on-deck unit with the winch and the rewinder, as in Figure 5.24-2. After spooling the line for certain length onto the probe unit (in "tail spool" part), the probe unit is released from the vessels in to the ocean, and then measure temperature, conductivity, and pressure during its free-fall with speed of roughly 4 m/s in the ocean. The probe unit is physically connected to the winch on the vessel by line. Releasing the line from the tail spool ensure the probe unit to be fall without physical forcing by the movement of vessel. After the probe unit

reaches the deepest layer for observation, it is recovered by using the winch on the vessel. The observed data are stored in the memory within the probe unit. The dataset can be downloaded into PCs via Bluetooth communication on the deck.

The specifications of the sensors are listed in Table 5.24-1. The UCTD system used in this cruise can observe temperature, conductivity and pressure from surface to 1000 m depth with 16 Hz sampling rate.

During the profiling, the vessel can be cruised (straight line recommended). The manufacturer recommends the maximum speed of the vessel during the profiling as in Table 5.24-2.

Parameter	Accuracy	Resolution	Range
Temperature (deg.C)	0.004	0.002	-5 to 43
Conductivity (S/m)	0.0003	0.0005	0 to 9
Pressure (dbar)	1.0	0.5	0 to 2000

Table 5.24-1:Specification of the sensors of the UCTD system in this cruise.

Table 5.24-2:Maximum	depth and	speed of the	vessel during	profile.

Maximum depth to profile	Maximum ship speed (knot)
0 to 350 m	13
350 to 400 m	12
400 to 450 m	11
450 to 500 m	10
500 to 550 m	8
550 to 600 m	6
600 to 650 m	4
650 to 1000 m	2



Figure 5.24-2:UCTD system installed and operated on R/V Mirai.

## (4) Preliminary Results

During this cruise, 30 casts of UCTD observation were carried out. Date, time and locations of the CTD casts are listed in Table 5.24-3.

Vertical profiles (down cast) of temperature, conductivity, salinity with descent rate are shown in Figure 5.24-3-5.24-7. Unfortunately, the data of station MKS04 was not stored in the memory within the probe unit.

# (5) Data archive

All data obtained during this cruise will be submitted to the JAMSTEC Data Management Office (DMO).

Station Cost		Time Towad	Position Towed		Donth to	Ship speed (knot)		S/N of	
Number	Vumbor		Lat.	Lon.	Depth to	Тот	Pacovoru	S/IN OI	Notes
Inullidei	Inullidei	(010)	(deg-min)	(deg-min)	go (III)	10w	Recovery	sensor	
MKS01	1	Nov.16 04:56	01-33.54N	120-29.99E	250	11.0	11.0	0236	
MKS02	1	Nov.16 06:16	01-24.49N	120-15.01E	250	11.2	11.2	0236	
MKS03	1	Nov.16 07:31	01-15.30N	120-00.01E	250	11.2	11.1	0236	
MKS04	1	Nov.16 08:49	01-06.14N	119-44.99E	385	11.3	11.3	0236	Not logging data
MKS13	1	Nov.16 21:50	02-00.02S	118-27.99E	385	11.7	11.6	0236	
MKS14	1	Nov.16 22:54	02-15.03S	118-27.99E	335	11.5	11.3	0236	
MKS15	1	Nov.16 23:57	02-30.02S	118-28.09E	335	12.0	11.8	0257	
MKS16	1	Nov.17 00:59	02-45.00S	118-28.00E	335	11.5	11.4	0236	
MKS17	1	Nov.17 02:00	03-00.03S	118-27.98E	335	11.4	11.3	0257	
MKS18	1	Nov.17 02:58	03-15.02S	118-28.00E	335	10.9	10.8	0236	
MKS19	1	Nov.17 04:00	03-29.98S	118-28.00E	335	10.9	10.8	0257	
MKS20	1	Nov.17 05:19	03-45.00S	118-19.19E	335	10.9	10.9	0236	
MKS21	1	Nov.17 06:43	04-00.00S	118-07.05E	335	10.4	10.4	0257	
LBK01	1	Nov.18 01:09	08-00.01S	115-59.99E	335	10.8	10.8	0236	
LBK02	1	Nov.18 02:33	08-15.01S	115-54.01E	335	11.5	11.3	0257	
LBK03	1	Nov.18 03:26	08-30.01S	115-48.02E	335	10.0	10.0	0236	
LBK05	1	Nov.18 05:36	09-00.00S	115-35.93E	335	11.2	11.3	0257	
LBK06	1	Nov.18 06:44	09-15.01S	115-29.89E	335	10.9	10.9	0236	
L24	1	Dec.17 14:01	04-10.02S	101-54.96E	335	10.9	10.4	0236	
L22	1	Dec.17 15:03	04-20.01S	101-50.02E	335	10.3	10.3	0257	
L20	1	Dec.17 16:01	04-30.02S	101-44.96E	335	10.3	10.1	0236	
L18	1	Dec.17 17:00	04-40.00S	101-39.98E	335	10.4	10.6	0257	
L16	1	Dec.17 18:09	04-49.99S	101-35.00E	335	11.0	11.0	0236	
L14	1	Dec.17 19:05	04-59.99S	101-30.00E	335	10.8	10.5	0257	

Table 5.24-3: List of UCTD stations during MR15-04 cruise.

L12	1	Dec.17 20:01	05-09.81S	101-25.00E	335	11.0	10.4	0236	
L10	1	Dec.17 20:57	05-19.98S	101-20.00E	335	11.2	10.4	0257	
L08	1	Dec.17 21:56	05-30.00S	101-14.99E	335	10.8	10.2	0236	
L06	1	Dec.17 22:55	05-40.00S	101-09.99E	335	11.0	10.4	0257	
L04	1	Dec.18 00:03	05-50.00S	101-04.99E	335	11.1	10.5	0236	
L02	1	Dec.18 01:00	06-00.00S	100-59.99E	335	10.3	10.3	0257	