5.25 Subsurface buoy

(1) Personnel (*: Leg-1, **: Leg-2, ***: Leg-1+2)

Masaki Katsumata ***	(JAMSTEC)	- Principal Investigator
Kunio Yoneyama*	(JAMSTEC)	
Shinsuke Toyoda*	(MWJ)	- Operation leader (Leg-1 [deployment])
Satoshi Ozawa*	(MWJ)	
Fujio Kobayashi*	(MWJ)	
Naoko Miyamoto*	(MWJ)	
Shungo Oshitani*	(MWJ)	
Yuki Miyajima*	(MWJ)	
Tomohide Noguchi**	(MWJ)	- Operation leader (Leg-2 [recovery])
Tetsuharu Iino**	(MWJ)	
Yasumi Yamada**	(MWJ)	
Miyo Ikeda**	(MWJ)	

(2) Objectives

The purpose of the subsurface buoy observation is to retrieve physical process underlying the dynamics of oceanic circulation in the Indian Ocean. In this cruise (MR11-07), we deployed subsurface mooring at 5S-78E in the beginning of Leg-1 and recovered the subsurface mooring in the end of Leg-2. Components of this mooring are depicted in Fig. 5.25-1.

(3) Methods

Three sensors are equipped on the mooring. Two are mounted at the top float of the mooring. One is ADCP (Acoustic Doppler Current Profiler) to observe upper-ocean currents from subsurface down to around 250m depths. The second instrument mounted below the float is CTD, which observes pressure, temperature and salinity for correction of sound speed and depth variability. The instrument “PAL (Passive Acoustic Listener)” is attached at 950-m depth, to measure the ocean acoustics to observe rainfall and wind speed at the ocean surface.

Details of the instruments and their parameters are as follows:

1) ADCP

Self-Contained Broadband ADCP 150 kHz
(Teledyne RD Instruments, Inc., Serial Number : 1155)
Distance to first bin: 8 m
Pings per ensemble: 16
Time per ping: 2.00 seconds
Bin length: 8.00 m
Sampling Interval: 1800 seconds

2) CTD

SBE-16
(Sea Bird Electronics Inc., Serial Number : 1279)
Sampling Interval: 1800 seconds

3) PAL

Passive Acoustic Listener

(Applied Physics Laboratory, University of Washington, Serial Number : 376004)

Frequency Range: 100 to 50000 Hz

Sampling interval: variable (records only when valid data was detected).

4) Other instrument

Acoustic Releaser

(BENTHOS, Inc., Serial Number : 666 and 667)

(4) Deployment

The ADCP mooring deployed at 5S-78E was planned to settle the ADCP at about 250-m depth. After we dropped the anchor, we monitored the depth of the acoustic releaser. As a result, the position of the mooring (No. 110929-05S078E) was obtained as follows:

Date: 29 Sep. 2011

Lat: 05-05.39S

Long: 078-05.56E

Depth: 4,989m

(5) Recovery

We recovered the ADCP mooring we deployed. The raw data from ADCP and CTD were recovered and converted into ASCII format. Results were shown as Figs. 5.25 -2 (for ADCP) and 5.25-3 (for CTD). The data from PAL will be recovered and converted after the cruise.

(6) Data archive

All data will be submitted to JAMSTEC Data Management Office.

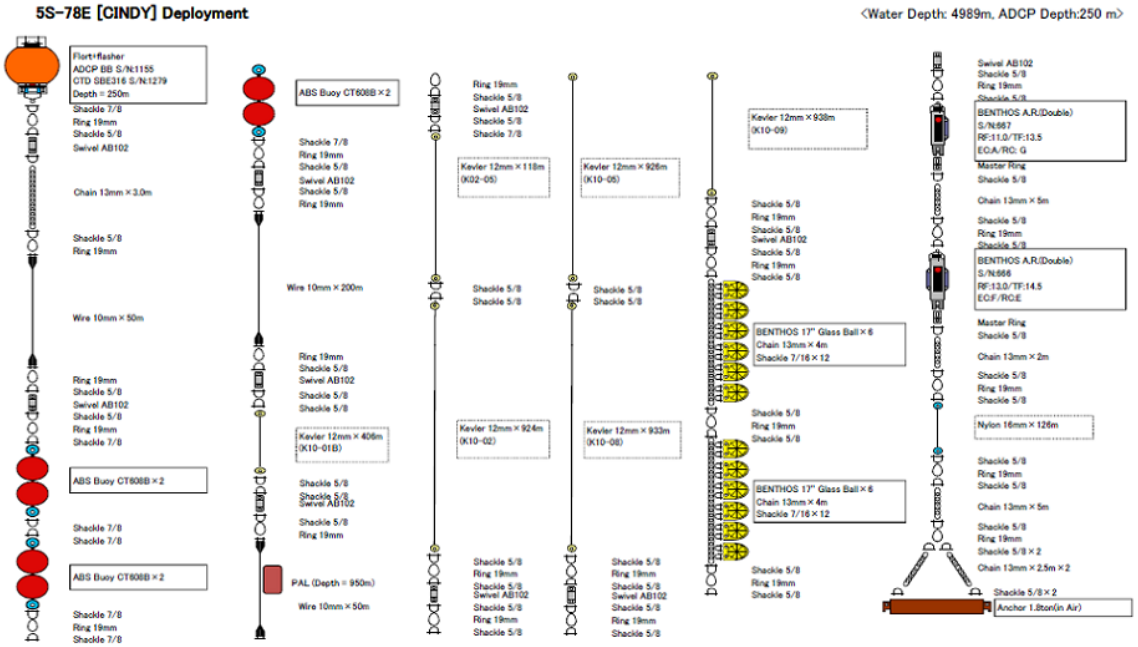

Fig.5.25-1 Mooring diagram.

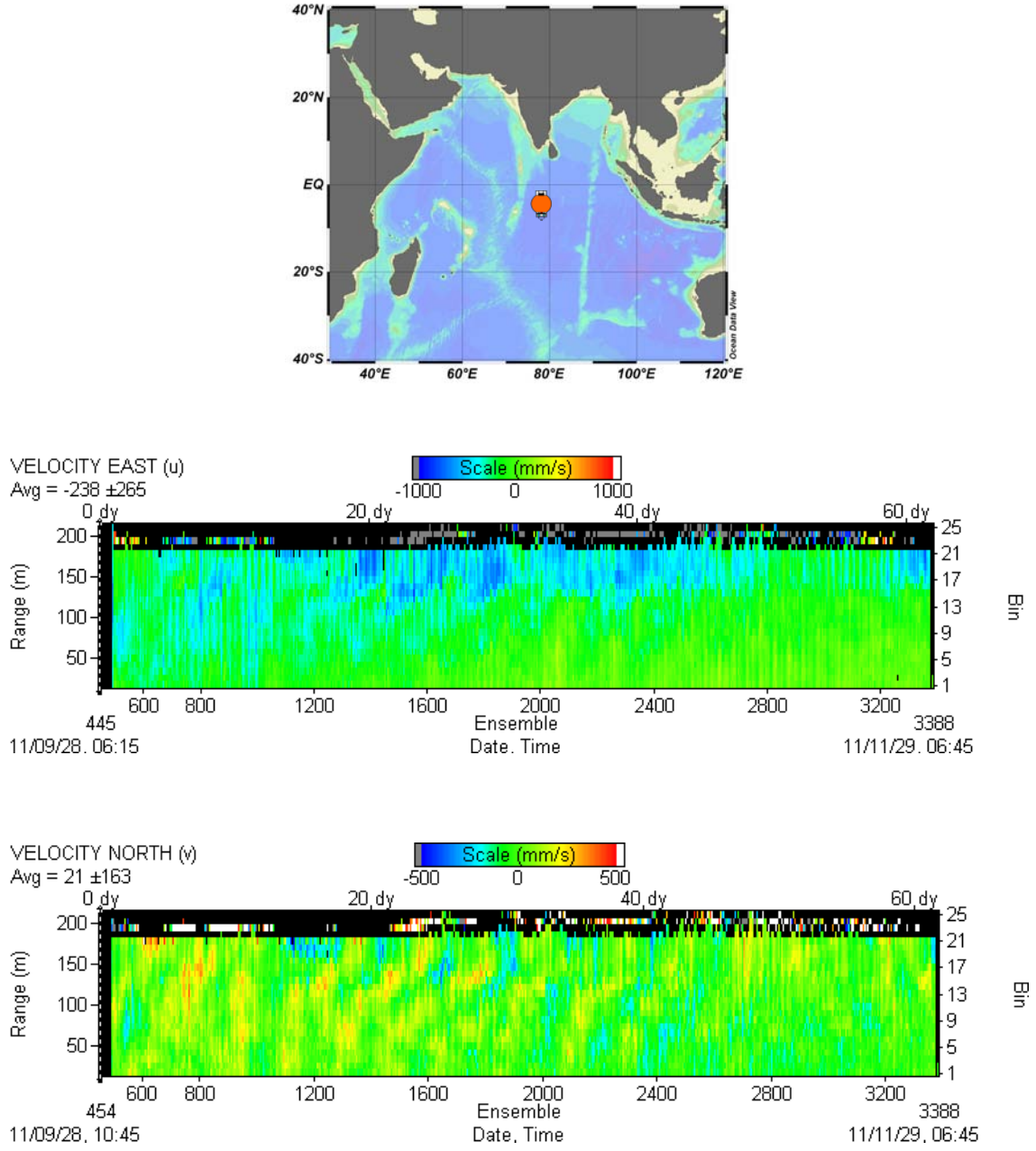

Fig. 5.25-2 Time Series of vertical profiles of zonal and meridional velocities obtained by the ADCP during mooring (Sep.29 to Nov.29, 2011)

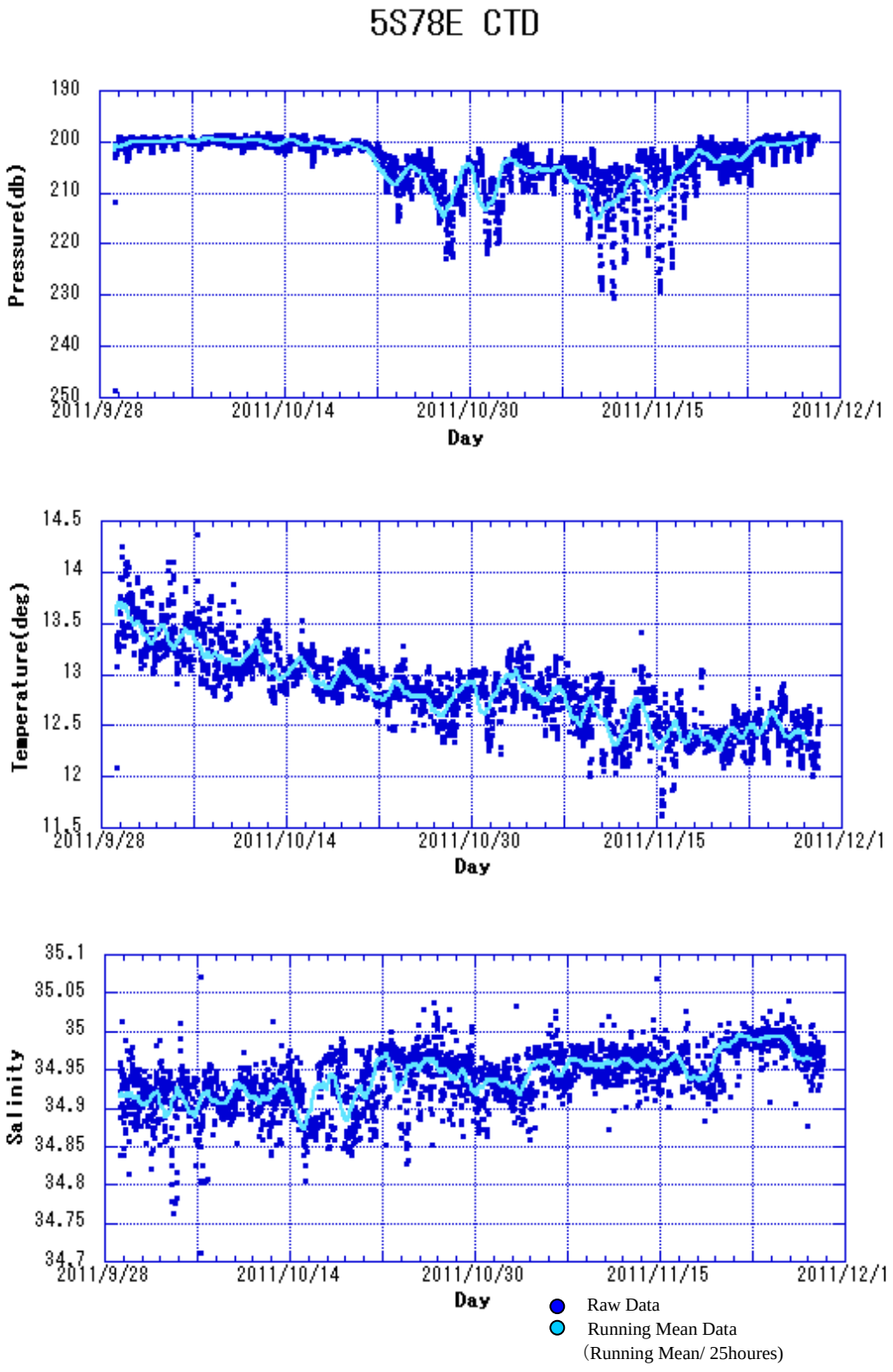

Fig. 5.25-3 Time Series of pressure, temperature, salinity obtained by the CTD during the mooring (Sep.29 to Nov.29, 2011)