5.24 TRITON moorings

5.24.1 TRITON moorings

(1) Personnel

Makito Yokota	(JAMSTEC): Principal Investigator
Iwao Ueki	(JAMSTEC): Principal Investigator
Akira Watanabe	(MWJ): Operation Leader
Masaki Yamada	(MWJ): Technical Staff
Kai Fukuda	(MWJ): Technical Staff
Kenichi Katayama	(MWJ): Technical Staff
Hiroki Ushiromura	(MWJ): Technical Staff
Rei Ito	(MWJ): Technical Staff
Keisuke Takeda	(MWJ): Technical Staff
Rio Kobayashi	(MWJ): Technical Staff
Masanori Enoki	(MWJ): Technical Staff
Yasuhiro Arii	(MWJ): Technical Staff
Hiroshi Hoshino	(MWJ): Technical Staff
Atsushi Ono	(MWJ): Technical Staff

(2) Objectives

The large-scale air-sea interaction over the warmest sea surface temperature region in the western tropical Pacific Ocean called warm pool that affects the global atmosphere and causes El Nino phenomena. The formation mechanism of the warm pool and the air-sea interaction over the warm pool has not been well understood. Therefore long term data sets of temperature, salinity, currents and meteorological elements have been required at fixed locations. The TRITON program aims to obtain the basic data to improve the predictions of El Nino and variations of Asia-Australian Monsoon system.

TRITON buoy (included m-TRITON buoy) array is integrated with the existing TAO (Tropical Atmosphere Ocean) array, which is presently operated by the Pacific Marine Environmental Laboratory/National Oceanic and Atmospheric Administration of the United States. TRITON is a component of international research program of CLIVAR (Climate Variability and Predictability), which is a major component of World Climate Research Program sponsored by the World Meteorological Organization, the International Council of Scientific Unions, and the Intergovernmental Oceanographic Commission of UNESCO. TRITON will also contribute to the development of GOOS (Global Ocean Observing System) and GCOS (Global Climate Observing System).

Three m-TRITON buoys have been recovered and three m-TRITON buoys deployed during this cruise (MR17-08).

(3) Measured parameters

The m-TRITON buoy observes oceanic parameters and meteorological parameters as follows:

Meteorological parameters : wind speed, direction,
air temperature, relative humidity,
shortwave radiation,
precipitation,
atmospheric pressure

Oceanic parameters : water temperature and depth at 1m, 10m,
20m, 40m, 60m, 80m, 100m, 120m, 140m,
200m, 300m, 500m,
conductivity at 1m, 10m, 20m, 40m, 60m,80m,100m,
current speed and direction at 10m

*TRITON and m-TRITON observes same oceanic parameters and meteorological parameters.

(4) Instrument

Details of the instruments used on the m-TRITON buoy are summarized as follows:

Oceanic sensors

1) CTD (Conductivity-Temperature-Depth meter, Sea Bird Electronics Inc.)

SBE-37 IM Micro CAT

A/D cycles to average : 4

Sampling interval : 600sec

Measurement range, Temperature : -5～+35 deg-C

Measurement range, Conductivity : 0～+7 S/m

Measurement range, Pressure : 0～full scale range

2) TD (Temperature and Depth meter, Sea Bird Electronics Inc.)

SBE-39 IM

Sampling interval : 600sec

Measurement range, Temperature : -5～+35 deg-C

Measurement range, Pressure : 0～full scale range

3) CRN (Current meter, Nortek AS)

Aquadopp IM400

Sampling interval : 1800sec

Sensor frequency : 2MHz

Velocity Range : ±5m/s

Meteorological sensors

1) Precipitation (JAMSTEC) *

MODEL Y50203

Sampling interval : 600sec

2) Relative humidity/air temperature (JAMSTEC) *

MODEL MP103A

Sampling interval : 600sec

3) Shortwave radiation (JAMSTEC) *

MODEL EPSP

Sampling interval : 600sec

4) Wind speed/direction (JAMSTEC) *

MODEL Y85000

Sampling interval : 600sec

5) Atmospheric pressure (PAROSCIENTIFIC.Inc.)

DIGIQUARTZ FLOATING BAROMETER_6000SERIES

Sampling interval : 600sec.

*Meteorological sensors were assembled with A/D (Analog/Digital) conversion PCB (Print Circuit Board) made by MARITEC (Marine Technology Center)/JAMSTEC

Data logger and ARGOS transmitter (Iridium transmitter)

1) Data logger

Meteorological sensors are controlled by I/O RS485.

GPS and Inductive modem are controlled by RS232C.

2) ARGOS transmitter (Iridium transmitter)

The data in the interval of 10 minutes are being transmitted through ARGOS transmitter (Iridium transmitter).

(5) Locations of m-TRITON buoys deployment

Nominal location : 5S 95E

ID number at JAMSTEC : 17509

ARGOS PTT number : 171E68B (60600)

ARGOS backup PTT number : 29791

Deployed date : 30 Nov. 2017

Exact location : 04°56.95’ S, 94°58.49’ E

Depth : 5,007 m

Nominal location : 8S 95E
ID number at JAMSTEC : 19507
ARGOS PTT number : 9EB84D4 (96109)
ARGOS backup PTT number : 30591
Deployed date : 28 Nov. 2017
Exact location : 08°00.06’ S, 95°02.51’ E
Depth : 5,208 m

Nominal location : 5S 100E
ID number at JAMSTEC : 97502
Iridium ID : 300434061415870
ARGOS backup PTT number : 30829
Deployed date : 03 Dec. 2017
Exact location : 05°00.00’ S, 100°00.00’ E
Depth : 5,541 m

(6) Locations of m-TRITON buoys recovered

Nominal location : 5S 95E
ID number at JAMSTEC : 17508
ARGOS PTT number : 29EB779 (45735)
ARGOS backup PTT number : 96773
Deployed date : 17 Nov. 2016
Recovered date : 01 Dec. 2017
Exact location : 05°06.51’ S, 94°58.51’ E
Depth : ---- m

Nominal location : 1.5S 90E
ID number at JAMSTEC : 18508
ARGOS PTT number : CFD07AD (139322)
ARGOS backup PTT number : 30830
Deployed date : 07 Feb. 2015
Recovered date : 26 Nov. 2017
Exact location : 01°37.06’ S, 89°59.02’ E
Depth : 4,694 m
*Top buoy drifted from deployment position at 20 Jan 2016. Top buoy and all meteorological sensors had been recovered at 11 May 2016. Under the snaped point was recovered in this cruise.

Nominal location : 8S 95E
ID number at JAMSTEC : 19506
ARGOS PTT number : 29EB75F(45733)
ARGOS backup PTT number : 30830
Deployed date : 20 Nov. 2016
Recovered date : 29 Nov. 2017
Exact location : 08°05.04' S, 95°08.16' E
Depth : 5,123 m

*Dates are UTC and represent anchor drop times for deployments and release time for recoveries, respectively.

(7) Details of deployed buoys

We had deployed three m-TRITON buoys, described them in the list below.

Deployment of m-TRITON buoys

Observation No.	Location	Details
17509	5S 95E	Deploy with full spec and 2 optional units. Security camera :with top buoy JES10-CTD IM: 301m
19507	8S 95E	Deploy with full spec and 2 optional units. Security camera :with top buoy JES10-CTD IM: 301m
97502	5S 100E	Deploy with full spec and 3 optional units. Security camera :with top buoy CO_2 and pH sensor :with top buoy SBE-39 IM: 301m

(8) Data archive

The data in the interval of 10 minutes were transmitted via ARGOS (Iridium) satellite data-transmission system in real time. These data will be archived at the JAMSTEC Yokosuka Headquarters. And the data will be distributed worldwide through the internet from the JAMSTEC web site (http://www.jamstec.go.jp/).