

# MR11-01 Cruise Summary

## 1. Cruise Information

- 1) Cruise Code: MR11-01
- 2) Ship Name: R/V Mirai
- 3) Title of Cruise (project): Tropical Ocean Climate Study
- 4) Chief Scientist: Yuji Kashino (RIGC, JAMSTEC)
- 5) Cruise Period: 31 December 2010 – 6 February 2011 (38 days)
- 6) Ports call: Koror (Republic of Palau) – Yokohama (Japan) – Sekinehama (Japan)
- 7) Research Area: Eastern equatorial Indian Ocean

## 2. Research Subjects

- 1) Observational research on air-sea interaction in the Kuroshio-Oyashio Extension region  
(PI: Yoshimi Kawai, RIGC, JAMSTEC)
- 2) Study of ocean circulation and heat and freshwater transport and their variability, and experimental comprehensive study of physical, chemical, and biochemical processes in the western North Pacific by the deployment of Argo floats and using Argo data  
(PI: Toshio Suga, RIGC, JAMSTEC)
- 3) Maritime aerosol optical properties from measurements of Ship-borne sky radiometer  
(PI: Kazuma Aoki, Toyama Univ.)
- 4) On-board continuous air-sea eddy flux measurement  
(PI: Osamu Tsukamoto, Okayama Univ.)
- 5) Tropospheric aerosol and gas profile observations by MAX-DOAS on a research vessel  
(PI: Hisahiro Takashima, RIGC, JAMSTEC)
- 6) Water sampling for building water isotopologue map over the Ocean  
(PI: Naoyuki Kurita, RIGC, JAMSTEC)
- 7) Lidar observations of optical characteristics and vertical distribution of aerosols and clouds  
(PI: Nobuo Sugimoto, National Institute for Environmental Studies)
- 8) Standardising the marine geophysics data and its application to the ocean floor geodynamics studies  
(PI: Takeshi Matsumoto, Univ. of Ryukyus)

## 3. Overview of Observations

- 1) Maintenance of TRITON/m-TRITON moorings  
3 buoys were recovered and re-installed at 8S,95E, 5S,95E and 1.5S,90E.  
All recovered buoys and deployed buoys at 8S,95E and 1.5S,90E were m-TRITON buoy. The deployed buoy at 5S,95E was a TRITON buoy.
- 2) Maintenance of subsurface ADCP moorings  
A mooring with an ADCP at the depth of 400m was recovered and re-installed at the equator, 90E.
- 3) Recovery of a prototype of the Southern Ocean Buoy  
A prototype of the Southern Ocean Buoy, which has been developing in JAMSTEC, was recovered near the Cape Erimo of Hokkaido.
- 4) CTD and water sampling: 6 casts  
Observations were conducted after deployment and before recovery of TRITON/m-TRITON buoys at 8S,95E, 5S,95E and 1.5S,90E.
- 5) Launch of Argo floats  
An Argo floats was launched at 5S, 90E.
- 6) Rain, water vapor, and surface water sampling: 3, 32, and 16 casts, respectively  
Rain, water vapor, and sea surface water were collected for analysis of stable isotopes
- 7) Continuous observations:  
Current profile observation by a shipboard ADCP  
Sea surface temperature, salinity, and dissolved oxygen, and CO<sub>2</sub> measurements by intake method  
Surface meteorological observations (wind, air temperature, pressure, humidity, radiation, rain rate, turbulent flux, and cloud base height)  
Aerosol observation using the Sky radiometer  
Aerosol and cloud profile measurements using two-wavelength lidar  
Aerosol and atmospheric gas observations by MAX-DOAS method  
Bathymetry, sea surface gravity and geomagnetic measurements