

MR11-06 Cruise Summary

1. Cruise Information

- 1) Cruise Code: MR11-06
- 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: 13 August 2011 – 20 September 2011 (39 days)
- 6) Ports call: Sekinehama (Japan) - Hachinohe (Japan) – Singapore (Republic of Singapore)
- 7) Research Area: Western equatorial Pacific and Kuroshio Extension region

2. Research Subjects

- 1) Observational research on air-sea interaction in the Kuroshio-Oyashio Extension region
(PI: Yoshimi Kawai, RIGC, JAMSTEC)
- 2) Distribution and Configuration of Clouds in Various Oceans
(PI: Takaaki Takano, Chiba Univ.)
- 3) Study of ocean circulation and heat and freshwater transport and their variability in the Pacific and Indian Oceans, and experimental comprehensive study of physical-chemical-biological processes in the western North Pacific by the deployment of Argo floats and using Argo data
(PI: Toshio Suga, RIGC, JAMSTEC)
- 4) On-board continuous air-sea eddy flux measurement
(PI: Osamu Tsukamoto, Okayama Univ.)
- 5) Water sampling for building water isotopologue map over the Ocean
(PI: Naoyuki Kurita, RIGC, JAMSTEC)
- 6) Lidar observations of optical characteristics and vertical distribution of aerosols and clouds
(PI: Nobuo Sugimoto, National Institute for Environmental Studies)
- 7) Maritime aerosol optical properties from measurements of Ship-borne sky radiometer
(PI: Kazuma Aoki, Toyama Univ.)
- 8) Tropospheric aerosol and gas observations on a research vessel by MAX-DOAS and auxiliary techniques
(PI: Hisahiro Takashima, RIGC, JAMSTEC)
- 9) 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 moorings
5 buoys were recovered at 8N,137E, 5N,137E, 2N,138E, 2N,130E, and 8N,130E
6 buoys were deployed at 8N,137E, 5N,137E, 2N, 138E, 0N138E, 2N, 130E, and 8N130E
- 2) Repair of K-TRITON buoy at 38N, 146-30E
Some meteorological sensors were exchanged and underwater cable was repaired.
- 3) Deployment of subsurface ADCP moorings
2 moorings with an ADCP at the depth of 400m and current meters were deployed at 7N,127E and 7N,128E.
- 4) CTD and water sampling: 51 casts
Observations were conducted along 137-138E, 2N, 130E and 7N lines until 500m -1000m depth with a lowered ADCP. CTD casts were also conducted until 2000m depth when Argo floats were lunched at 36N, 145-45E and 25N, 142-18E.
- 5) XCTD: 33 casts
Measurement depth is 1000m. Observations were conducted in the tropical and Kuroshio Extension region.
- 6) Ocean turbulence observations: 34 casts
Ocean turbulence was observed every 30nm or 60 nm along 137-138E, 2N and 130E lines until 500m depth.
- 7) Launch of Argo floats: 12 floats
Two floats were deployed at 36N, 145-45E and 25N, 142E-18E under the JAMSTEC Agro project. Other 10 floats, which were prepared by Univ. of Hawaii, were deployed in the North Equatorial Current region.
- 8) Surface drifters.: 30 drifters
12 drifters were deployed east of Japan, and 18 drifters were deployed in the equatorial region.
- 9) Radiosonde observation: 23 casts

Radiosonde observation was conducted in the Kuroshio Extension region together with XCTD observation.

10) Rain, water vapor, and surface water sampling: 19, 60, and 31 casts, respectively

Rain, water vapor, and sea surface water were collected for analysis of stable isotopes

11) Continuous observations:

Current profile observation by a shipboard ADCP

Sea surface temperature, salinity, and dissolved oxygen by intake method

Surface meteorological observations (wind, air temperature, pressure, humidity, radiation, rain rate, turbulent flux, and cloud base height)

Doppler radar (only in the Kuroshio Extension region)

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