

# KAIREI Cruise Report

## KR10-E04



Kuroshio Extension region

9 – 13 October 2010

Japan Agency for Marine-Earth Science and Technology  
(JAMSTEC)

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1. Cruise Information

1.1 Cruise number: KR10-E04

1.2 Name of vessel: KAIREI

1.3 Title of the cruise: Emergency cruise for the recovery of the K-TRITON buoy

1.4 Title of proposal: Observation Research on the Kuroshio Transport and Sea Surface Flux

1.5 Cruise period: 9 – 13 October 2010

1.6 Ports of call: From / To JAMSTEC Wharf 1.

1.7 Research area: Kuroshio Extension Region

1.8 Research map:

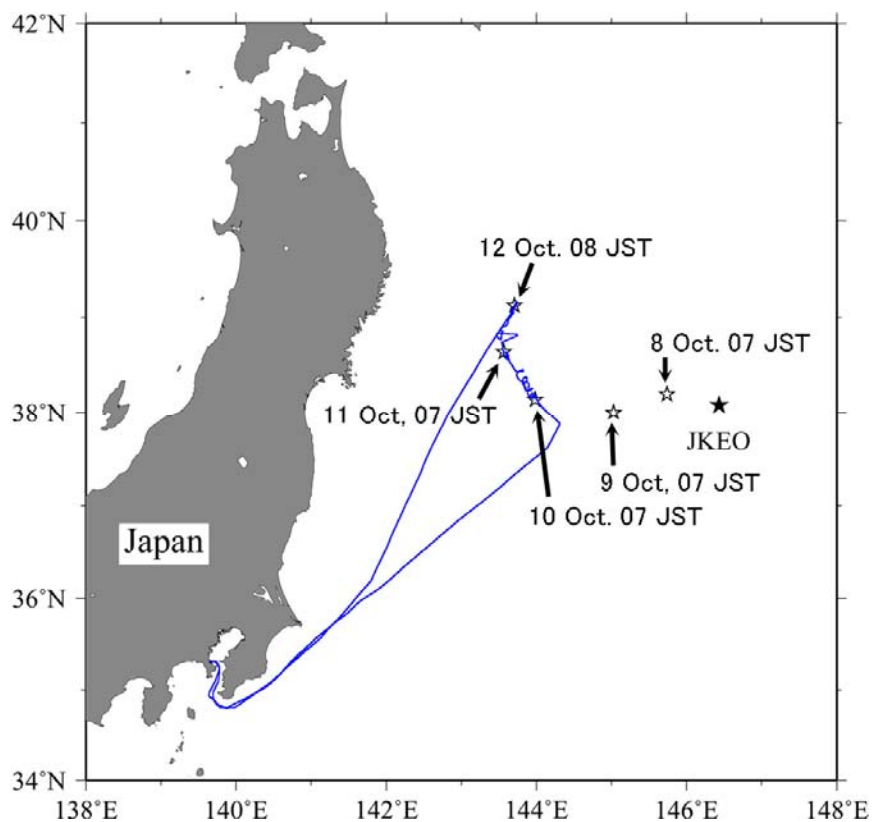


Figure 1. Cruise track with buoy positions in the morning on each day (white star). Black star represents the mooring point of the buoy (JKEO site).

## 2. Researchers

### 2.1 Chief scientist (on-board responsible person): Akira Nagano

Ocean-Atmosphere Interaction Research Team

Ocean Climate Change Research Program

Research Institute for Global Change (RIGC)

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

### 2.2 Representative of the science party:

Yoshimi Kawai RIGC/JAMSTEC

### 2.3 Science party:

Yoshimi Kawai	RIGC/JAMSTEC (not on board)
Akira Nagano	RIGC/JAMSTEC
Hiroshi Matsunaga	Marine Technology Center/JAMSTEC
Hiroshi Ichikawa	RIGC/JAMSTEC (not on board)
Hiroyuki Tomita	RIGC/JAMSTEC (not on board)
Kyoko Taniguchi	RIGC/JAMSTEC (not on board)

### 3. Activities

#### 3.1 Background and purpose

The amount of air-sea turbulent heat flux in the Kuroshio Extension (KE) region is the largest among the world oceans. It is expected that the large heat transfer affects the atmosphere on both small and large scales. To understand the interaction between the atmosphere and the ocean circulation in the North Pacific, it is necessary to examine the spatial distribution of surface heat flux around the KE region and its temporal variations with high accuracy. However, the existing heat flux data have still large uncertainty. Furthermore, this is one of the major CO<sub>2</sub>-sink regions, and the partial pressure measurement of CO<sub>2</sub> in the surface water is very important to evaluate the CO<sub>2</sub> budget.

There are two moored buoys in the observation area: one is the K-TRITON buoy of JAMSTEC, which was deployed at 38°04.8'N, 146°25.2'E (JKEO site) north of KE in November 2008, and the other is the KEO buoy of NOAA, which was deployed at 32°19.0'N, 144°33.3'E (KEO site) south of KE in September 2008. They had been obtaining oceanic and surface meteorological data for research on surface heat flux estimation and air-sea interaction. These buoys also had pCO<sub>2</sub> sensors for biogeochemical research.

We exchanged (recovered and deployed) these moored buoys on the KY09-07 cruise in Aug.-Sep. 2009 to maintain the long-term fixed-point oceanic and meteorological observations. In the morning on 8 Oct. 2010, we found from Argos position data that the K-TRITON buoy, which was deployed on 29 Aug. 2009, was fast drifting westward. Around the noon on 8 Oct. 2010, we urgently decided to perform an emergency cruise to find and recover the drifting K-TRITON buoy, the mooring wire of which must have been broken, by using R/V KAIREI.

#### 3.2 Results

The drifting K-TRITON buoy was found in the morning on 10 Oct. 2010, and recovered on 12 Oct. (see Fig.2 and section 3.4). The mooring wire was broken at the point of about 63 cm from the top of wire, which was at about 4 m depth. The top buoy (buoy hull) was hardly damaged, except that the propeller of the anemometer disappeared. R/V KAIREI and the buoy returned to JAMSTEC on 13 Oct.

[Positions]

Mooring point (anchor position):	38°04.7087'N,	146°25.7551'E
Found the buoy:	38°06.36'N,	144°00.00'E
Recovered the buoy:	39°07.44'N,	143°42.48'E

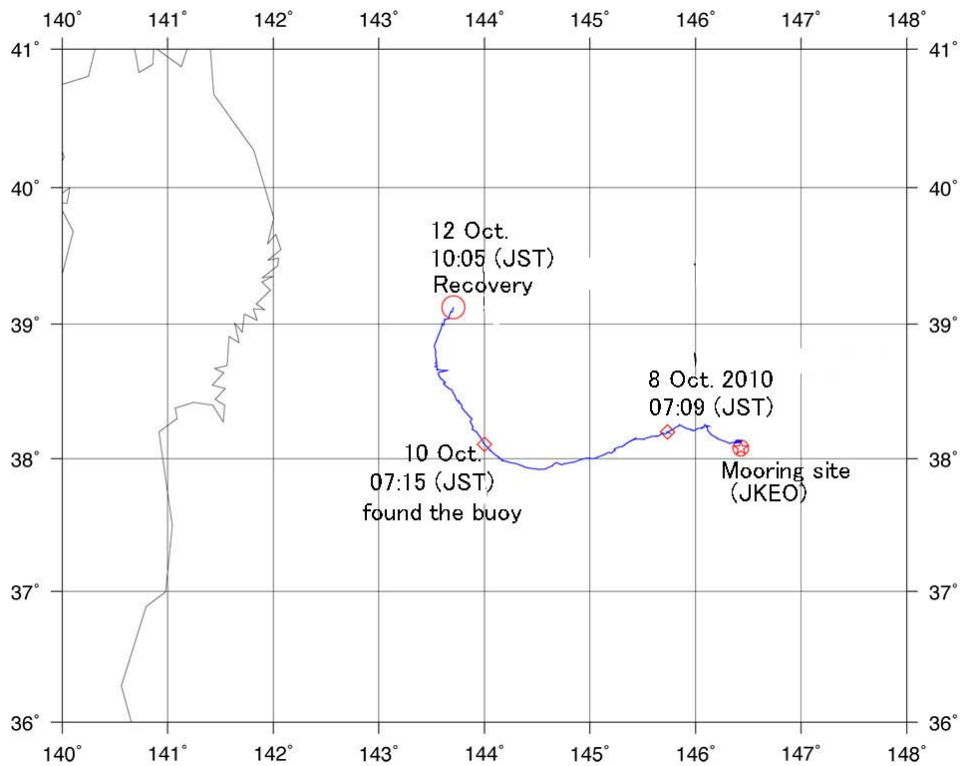


Figure 2. Drift track of the K-TRITON buoy.

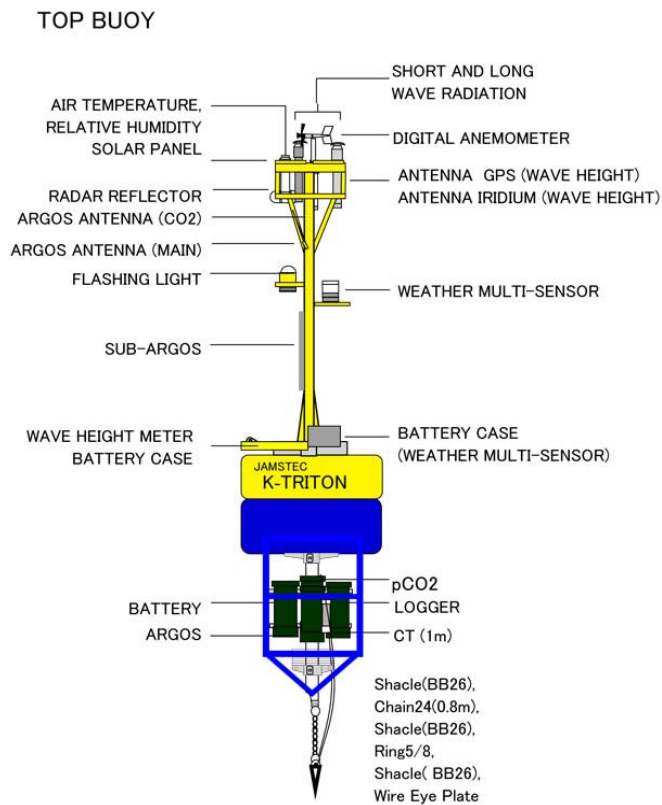


Figure 3. Recovered K-TRITON buoy (only top buoy)

### 3.3 Instruments

K-TRITON buoy	JAMSTEC
Anemometer	ASIMET WS/D Module (Star Engineering)
Thermometer/hygrometer	ASIMET RH/AT Module (Star Engineering)
Shortwave radiometer	ASIMET SW Module (Star Engineering)
Longwave radiometer	ASIMET LW Module (Star Engineering)
CTD	37-IM, 37-IMP, 39-IM, 37-SM (Sea-Bird Electronics)
pCO <sub>2</sub> sensor	handmade at MIO/JAMSTEC
Wave gauge	Zeni lite buoy

### 3.4 Cruise log

Date	Time		Event
	(JST)	(UTC)	
9 Oct.	06:00	21:00 (-1d)	Japan Standard Time is (UTC+9h) Depart from JAMSTEC Wharf 1.
10 Oct.	07:15	22:15 (-1d)	Find the K-TRITON buoy Stand by near the buoy until the wave height becomes low
12 Oct.	08:20	23:20 (-1d)	Start the K-TRITON buoy recovery operation
	10:05	01:05	Finish the recovery operation
13 Oct.	10:30	01:30	Arrive at JAMSTEC Wharf 1

### 3.5 Future plans

We are planning to recover the underwater part of the mooring on the MR11-02 cruise in Feb.-Mar. 2011.

## 4. Notice on using

This cruise report is a preliminary documentation as of the end of the cruise.

This report may not be corrected even if changes on contents (i.e. taxonomic classifications) may be found after its publication. This report may also be changed without notice. Data on this cruise report may be raw or unprocessed. If you are going to use or refer to the data written on this report, please ask the Chief Scientist for latest information.

Users of data or results on this cruise report are requested to submit their results to the Data Integration and Analysis Group (DIAG) of JAMSTEC.

#### Acknowledgements

We would like to express our sincere thanks to Captain S. Ryono and his crew for their skillful ship operation.