

KR10-E04 Cruise Summary

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 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)

1.5 Representative of the science party: Yoshimi Kawai (not on board)

Ocean-Atmosphere Interaction Research Team

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

1.6 Cruise period: 9 – 13 October 2010

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

1.8 Research area: Kuroshio Extension Region (see Figure below)

2. Overview

2.1 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 CO₂-sink regions, and the partial pressure measurement of CO₂ in the surface water is very important to evaluate the CO₂ 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 pCO₂ 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, it is found from Argos position data that the K-TRITON buoy, which was deployed on 29 Aug. 2009, was fast drifting westward. 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 KAIEI around the noon on 8 Oct. 2010.

2.2 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 seldom 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 |

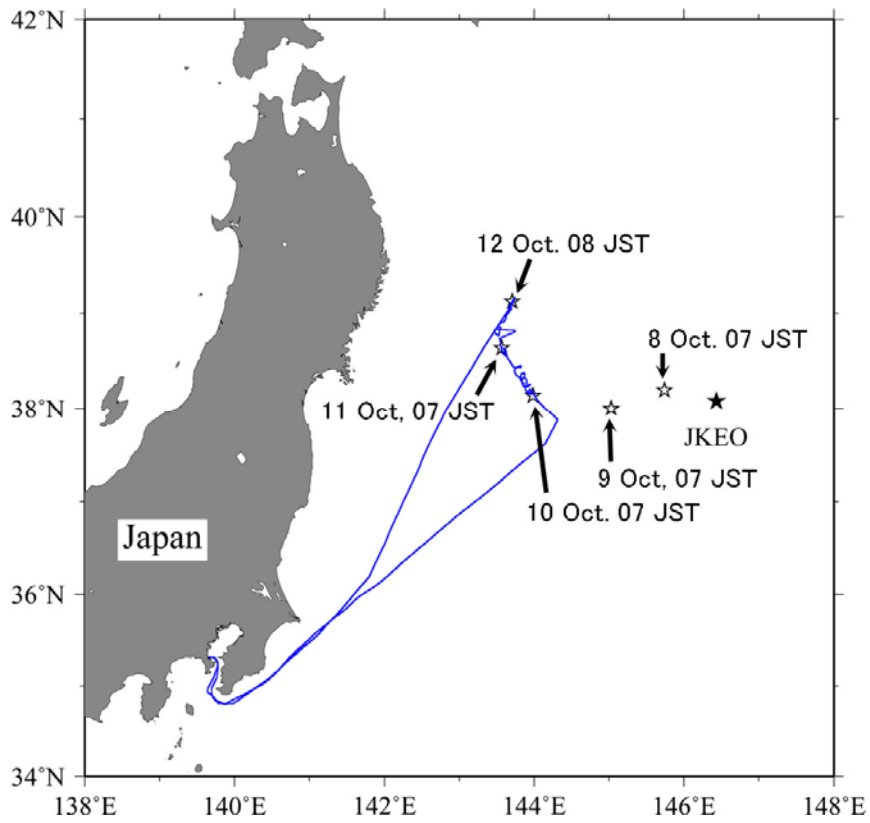


Figure. Cruise track with buoy positions in the morning on each day (white star). Black star represents the mooring point of the buoy (JKEO site).