

# **Shipboard measurement of turbulent fluxes by eddy covariance technique in the Kuroshio Extension region**

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## Abstract

We evaluate the turbulent heat and momentum fluxes in the Kuroshio Extension region in the northwest Pacific by the onboard system of the direct measurement by the eddy covariance technique developed by Okayama University. The contamination by the movement of the ship body was removed by the record of the accelerometer attached on the position very near to the sonic anemometer. The observation was carried out during the cruise of the R/V Tansei-maru in October, 2009 (KT0921), when the ocean mixed layer started to grow up, as well as the comprehensive measurement of the boundary layer in the atmosphere and the ocean using radio sondes, Conductivity-Temperature-Depth (CTD) profiler and the Microstructure Profiler (MSP) every 3 hours. One hour from 9PM every day was dedicated for the flux measurement, i.e., the ship went into the upwind direction without changing its direction and speed in order to keep the stable condition to minimize the ship body effect. We evaluated the influences of several assumptions in this technique on values of turbulent fluxes to be computed. It is found that the removal of the low frequency fluctuation as well as the trend from the record of the wind is important for the computation of the flux. There are discrepancies between the eddy covariance heat fluxes and those computed by the COARE3.0 bulk flux algorithm. How systematic the disagreements are is evaluated by considering the oceanic and atmospheric condition. At last, we will present our next cruise plan in the next winter (March, 2011), which will include the measurement of the swell and the windsea by a surface drifting wave follower buoy in addition to the other boundary layer measurements done in KT0921.

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