Development of the air-sea flux observing system

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Although there are many global air-sea flux products in these days, evaluation and improvement of global air-sea flux products are still crucial for atmospheric, oceanographic and climate research and weather and climate prediction. For that purpose, in situ observations by research vessels and mooring buoys are essential. As a part of the TAO (Tropical Atmosphere and Ocean)/TRITON (Triangle trans-ocean buoy network) array, we are conducting the air-sea flux observation in the western Pacific and eastern Indian Ocean. Basically, sensors for ocean surface wind, air temperature, humidity, barometric pressure, shortwave radiation, and precipitation are installed on the surface buoy of the TRITON mooring. The mooring observation has the advantage to acquire detailed direct measurement record at a fixed point, however it takes relatively high cost to keep many sites. Because of progress of the development of unmanned ocean surface vehicles, such as the Wave Glider and the Saildrone, we can use these vehicles as a platform for air-sea flux observation. Using the Wave Glider, we are conducting development of air-sea flux observing system. As payloads, we install three types of meteorological sensor units; the Weather Station (Airmar), Weather Transmitter (Vaisala), and JAMMET (JAMSTEC). The observed parameters are air temperature, relative humidity, barometric pressure longwave radiation, shortwave radiation, and wind. Underwater sensors for temperature, conductivity and pressure and thermistor chain for temperature profile within 10 m depth are also installed. The acquired data are recorded on logger system and transmitted to land station via iridium satellite communication system. We have conducted a series of field experiments mainly in the western tropical Pacific in the last year. Results of the experiments will be introduced in the presentation.

Keywords: Air-sea flux, Wave Glider, in situ neasurements

