Geophysical Research Abstracts, Vol. 9, 06195, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06195

Underwater profiling buoy system for observation of phytoplankton productivity

T. Fujiki (1), S. Watanabe (1), T. Hosaka (2,3) and T. Saino (3,2)

(1) Japan Agency for Marine-Earth Science and Technology, (2) Japan Science and Technology Agency, (3) Nagoya University, Japan

The primary productivity of the world oceans has been measured mostly by the radiocarbon tracer method or the oxygen evolution method. These traditional methods require bottle incubations for periods ranging from hours to a day. This methodological limitation has hindered our understanding of the spatial and temporal variability of oceanic primary productivity. One of the active fluorescence techniques, fast repetition rate (FRR) fluorometry can measure a single turnover fluorescence induction curve in photosystem II. The parameters derived from the fluorescence induction curve provide information on the physiological state related to photosynthesis and can be used to estimate gross primary productivity. FRR fluorometry has several advantages over the above-mentioned traditional methods. Most importantly, because measurements made by FRR fluorometry can be carried out without the need for time-consuming bottle incubations, this method enables real-time high-frequency measurements of primary productivity. In addition, the FRR fluorometer can be used in platform systems such as moorings, drifters, and floats. Saino et al. (2004) developed an underwater profiling buoy system that uses the FRR fluorometer, supported by the Japan Science and Technology Agency. In the present study, we used the profiling buoy system to observe primary productivity in the western North Pacific Ocean, over about 40 days. This study is the first attempt to use a profiling buoy system by deep sea mooring. Here, we show the results of observations and discuss potential benefits of the profiling buoy system for the measurement of oceanic phytoplankton productivity at high spatial and temporal resolutions.