

Interactive comment on “Development of a new expendable probe for the study of pelagic ecosystems from Voluntary Observing Ships” by M. Marcelli et al.

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Received and published: 11 December 2006

All the answers to Referee #1 comments were inserted in the manuscript.

The manuscript was revised giving an interpretation of discrepancies when observed and improving the discussion of the results. This was possible excluding some paragraphs concerning technical specifications of the electronic system in order to streamline the text.

A more recent bibliography about remote sensing as a method for phytoplankton biomass estimate was added. Carr, M.-E., M.A.M. Friedrichs, M. Schmeltz, M.N. Aité, D. Antoine, K.R. Arrigo, I. Asanuma, O. Aumont, R. Barber, M. Behrenfeld, R. Bidigare, E. Buitenhuis, J. Campbell, A. Ciotti, H. Dierssen, M. Dowell, J. Dunne, W. Esaias, B.

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Interactive Discussion

Discussion Paper

Gentili, S. Groom, N. Hoepffner, J. Hishisaka, T. Kameda, C. LeQuéré, S. Lohrenz, J. Marra, F. Mélin, K. Moore, A. Morel, T. Reddy, J. Ryan, M. Scardi, T. Smyth, K. Turpie, G. Tilstone, K. Waters, Y. Yamanaka; A comparison of global estimates of marine primary production from ocean colour, Deep-Sea Research, Part II, 53, 741-770, 2005

Following are reported point by point the corrections operated and the answers to the specific comments.

Page 1518 and in the Abstract: “This method is an in vivo Chlorophyll measurement...” was substituted with “This method is an in vivo chlorophyll estimation that can get the immediate biophysical reaction of phytoplankton inside the aquatic environment”.

Page 1521: “For the chlorophyll a fluorescence measurements is employed a semiconductor element..” was cancelled with all the paragraph 3.2

The fall rate equation adopted to estimate the probe's falling speed was obtained from the studies referred to XBT (Reseghetti et al. 2006). The equation adopted for the XBT is specific for a probe launched from a high of two meters while our prototype was left at the water surface: for XBT the falling rate diminishes along the water column before reaching a constant speed, while for our prototype (for some of the field tests) the velocity becomes greater before reaching a constant speed.

A graph representing the transmittance respect to the wavelength of the LEDs employed for the fluorescence measurement was inserted in the Development and Optimization paragraph (Figure 5).

The chlorophyll “a” concentrations range for calibrations goes from 0.01mg/m³ to 0.9 mg/m³: this is due to the grater difficulty of this probe to detect the small concentrations, while for the higher ones (the tests were leaded reaching at most 2 mg/m³) there is a good linear relation between the calibrated probe's signal and the real concentration. Moreover the Tyrrhenian Sea, where the probe was tested, corresponds to this range of chlorophyll “a” concentrations (Marcelli et al. 2005).

Fluorimeter was replaced with Fluorometer

Fig 6.and Fig.7 On the basis of the preliminary experimentation, different prototypes were assembled and tested. At first were assembled two retrievable prototypes which enabled to carry out in situ tests, analysing the output signals and directly bringing the required modifications (to the gain or to the optics). The study carried out with the retrievable prototypes brought to the assemblage of the first 30 pre serie launchable probes. The first prototype, the retrievable one, has the measurement cell a little larger and geometrically different from the definitive probe, that's why in the calibration of the two types of probes (the retrievable and the launchable) there are big differences in the regression coefficients.

In Fig. 9 the units for fluorescence are given in mV as in Fig. 8, so it was reported in the subtitle. (All figures and page numbers are referred to the previous version of the manuscript).

More details were given on where and when the measurements have been performed (Field Tests)

Bosc et al. 2003 in the text was substituted with Bosc et al. 2004. Falkowsky et al. in the text was corrected with Falkowsky P.G. 2001. In the References was inserted the review where is published Marcelli et al. 2005.

Interactive comment on Ocean Sci. Discuss., 3, 1515, 2006.

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