

## **Anonymous Referee #1**

*Received and published: 27 July 2009*

*Overall comment:*

*The first part of the manuscript is well written and all details are good explained. In this part I have only minor suggestions. The “Results and Discussion” part contains a lot of information and is hard to read. Since the manuscript deals with the huge amount of biogeographical provinces and a temporal range of 8 years it is hard to follow and also the tables don't help to understand the text. My suggestion is to structure the discussion part analogue to chapter 2.4. More (and bigger) figures might help to understand the complex dataset.*

**The results have been structure analogue to chapter 2.4. So, the biogeochemical changes observed along the Atlantic Ocean was specifically described for each separated region. Figures have been enlarged for clarity.**

*Specific comments:*

*Ch. 2.2. and 2.3. Since only 2 standard gases are used to calibrate the instrument an estimation about the accuracy should be given somewhere in one of these sections.*

**The recommendations established from different Workshops point out the standards were traceable to reference standards provided by NOAA/Earth System Research Laboratory (Pierrot et al., 2009). In this sense, Izaña meteorological station (Canary Islands; <http://www.inm.es/>) belongs to the NOAA CMDL Carbon Cycle Cooperative Global Air Sampling Network. The accuracy of our standards is  $\pm 0.1$  ppmV.**

**The new version of the manuscript includes this information: “Two standards were used through this channel; CO<sub>2</sub>-free air and a CO<sub>2</sub> standard gas of known concentration ( $375 \pm 0.1$  ppm) certified by Instituto Meteorológico Nacional de Izaña (Canary Islands, Spain).”.**

Table 1: The information in this table is not necessarily needed. It can be an appendix or deleted.

**The Table information gathering the dates and the ships of different cruises have been kept.**

Table 3: It's not easy to understand the table. Since the table shows the coefficients in Eqn. 4 the columns should be named accordingly: Not Lon(E), lat(E), but A, B, C: : Then the coefficient should have the same order as in the equation: The chl not in the end.

**The Table have been changed. So, coefficients show the same nomenclature and order of the Eq. 4.**

Figure 2: There is too much information in one figure. It is impossible to see differences for any parameter and for the different colors.

**Figures have been enlarged for clarity.**

Figure 3: It is much harder to get any information out of this figure. First a,b,c: : : are not explained and second it is too small to distinguish between circles and squares. Even the labels of the axes are too small.

**Following your suggestion, the circles and squares have been replaced with empty and filled circles.**

Technical comments:

p. 5592, l.5: the year of the Takahashi reference is 2009.

**The correct reference has been included**

#### **REFERENCES**

**Bender, M., Doney, S., Feely, R. A., Fung, I. Y., Gruber, N., Harrison, D. E., Keeling, R., Moore, J., Sarmiento, J., Sarachik, E., Stephens, B., Takahashi, T., Tans, P.P., Wanninkhof, R., 2002. A Large Scale Carbon Observing Plan: In Situ Oceans and Atmosphere (LSCOP). Nat. Tech. Info. Service, Springfield, p. 201.**

**Pierrot, D., Neill, C., Sullivan, K., Castle, R., Wanninkhof, R., Lüger, H., Johannsen, T., Olsen, A., Feely, R. A., Cosca, C. E.: Recommendations for autonomous underway pCO<sub>2</sub> measuring systems and data-reduction routines. Deep-Sea Res. II, doi:10.1016/j.dsr2.2008.12.005, 2009.**