Although the manuscript has been improved, it still exhibits two important inconsistencies related to the effects of irradiance and iron. These imprecisions had already been identified in some way by the three reviewers in their previous reviews.

Concerning light, the figure 2 clearly shows that P_m^B was significantly lower at low irradiance than at high irradiance. This figure also shows the opposite response for α^B, which was significantly higher at low irradiance than a high irradiance. However, the manuscript comment the results in this figure 2 on page 10 (lines 204-206) writing *"Irradiance variations generated changes in P_m^B, α^B and Ek values,* ***which increased significantly ($p < 0.05$) at the low and constant irradiances*** *(Fig. 2)"*. Surprising, the contrary was written in the abstract, where is possible to read (lines 33-35) *"Specifically,* ***reduced irradiance resulted in decreased P_m^B and α^B values****, whereas reduced iron…"* but the effect of light in the CORSACS experiments is discussed (page 16, lines 342-350) assuming the opposite response, increases in both P_m^B and α^B and invoking Fig. 2.

About iron, table 3 shows significant higher values of P_m^B in waters with iron concentrations < 0.1 nM during PRISM cruise and this was the only significant difference in photosynthetic variables related to iron variability. However, in the abstract is possible to read "*However, irradiance, dissolved iron concentrations, and carbon dioxide concentrations* ***when altered under controlled conditions*** *exerted significant influences on photosynthetic parameters. Specifically, reduced irradiance resulted in decreased P_m^B and α^B values,* ***whereas reduced iron concentrations were associated with increased P_m^B and α^B values***". But altered controlled conditions are only shown in Fig. 2, where the effect of iron is not significant. In the discussion it is also possible to read (page 15, lines 325 and 326) *"****Reduced iron concentrations, however, resulted in lower P_m^B values****, despite the relatively limited number of measurements at concentrations less than 0.1 nM"*

Specific comments

Abstract

Page 2, line 29. α should read α^B. 64% should read 48% according to the values given in table 4.

Introduction

Page 3, lines 58-59. Modify this sentence because P_s^B is the chlorophyll (or biomass)-specific light saturated of photosynthesis in the absence of photoinhibition.

Page 3, lines 61-62. Modify this sentence because P_m^B is the chlorophyll (or biomass)-specific light saturated (realized) rate of photosynthesis.

Page 3, line 63. Ek is derived from the ratio of P_m^B (not P_s^B) and α^B

Page 5, line 109. Remove maximum or irradiance-saturated, because the meaning is the same.

Methods

Page 6. Line 119. December, 2006 should read December, 2005

Page 7, line 147. I suggest including "original solution". Then, the sentence could be: and total available inorganic ^{14}C-bicarbonate was assessed by counting aliquots of the original solution directly in scintillation fluor.

Page 7, line 154. P_m^B is the maximum realized (or irradiance-saturated) rate of photosynthesis. The irradiance-saturated rate of photosynthesis in the absence of photoinhibition is P_s^B and $P_s^B \geq P_m^B$.

Page 9, lines 180 and 181. This sentence should be relocated on page 7, lines 151 and 152.

Page 10, lines 216-226. This paragraph is apparently better connected to the paragraph in the next section (page 12, lines 250-259) where the influence of nutrients and temperature is again analysed. May be the two paragraphs can be combined to analyse the 3 environmental variables (temperature, nitrate and iron) together.

Page 11, line 229. I think it is unclear what lack of correlation means. I understand lack of relationship between photosynthetic parameters and % of surface irradiance. If I am right it could be specified.

Page 12, line 247. 1.1 ± 0.77 is 1.1 ± 0.60 in table 4

Page 12, line 253. The values of the range of nitrate concentration here are close but different to the values given before on page 10, line 218. 54 P-E measurements should read 56 P-E measurements according to table 3.

Discussion

Page 15, lines 332-334. But CORSACS experiments lasted for several days or at least this is deduced from what was written at the bottom of page 9 and at the top of page 10. According to this, phytoplankton could acclimate to iron additions and modify the photosynthetic response to these new conditions, as was the case for the two levels of irradiance and the two levels of CO2.

Page 16, lines 353-354. The sentence "*Enhanced α^B values may reflect the interaction between light-limited and light-saturated rates described by Behrenfeld et al. (2004)*" needs further explanation. It is not directly evident for the audience.

Page 17, lines 366-368. I am not totally convinced about the idea that only environmental features determine the P-E response, I think species are also important because they integrate, in some way, the environmental variability.

Figure legends

Figure 2. The level of probability must be specified. Typically, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Figure 3. Replace α by α^B in the text and in the equation, and replace P_s^B by P_m^B in the text.

Figures

Figure 2. Replace P_m^b by P_m^B and α by α^B in the 3 legends; photons should read quanta in the legend of the right axis.

Figure 3. Replace P_m^b by P_m^B and α by α^B in the 2 legends.

Tables

Table 2. Honestly, I do not think that Zmix and Z1% were determined with such exactitude. One meter of precision (without decimal figures) should be enough.

Table 3, Footnote. For this level of probability two asterisks are needed.