Seasonal evolution of net and regenerated silica production around a natural Fe-fertilized area in the Southern Ocean estimated from Si isotopic approaches, by I. Closset[1], M. Lasbleiz[2], K. Leblanc[2], B. Quéguiner[2], A.-J. Cavagna[3], M. Elskens[3], J. Navez[4], and D. Cardinal[1,4]

General comment

Closset *et al.* present a study investigating the seasonal evolution of net and regenerated silica production in the Indian sector of the Southern Ocean (KEOPS study). The manuscript is well presented, and the results are interesting. I only have a few comments, and I recommend publication of this manuscript after minor revisions.

Specific comments

Throughout the manuscript silica production and dissolution rates are defined as either P and D (abstract), or ρSi and ρDiss (Eq. 1 and Eq. 2, pages 10 for example). The authors should use only one of these acronyms to help the reader.

Page 11- line 15-19 : The authors discuss the relevance of the 2 models and say that the accuracy and the sensitivity of each model was tested. The authors could mention what type of procedure was used to select the model (was it an Akaike information criterion or something similar ?).

Page 18 – and Figure 6, page 51 : If I understand correctly, net production rates are calculated from the difference ∫ρSi - ∫ρDiss (x-axis). If so, I'm not sure that the authors can plot (1-∫ρSi :∫ρDiss) as a function of (∫ρSi - ∫ρDiss), because the two variables are not independent.
For example, if we use a random set of values for ∫ρSi and ∫ρDiss (consistent with the range of values listed in Table 2 : from 3.09 to 47.9 mmol m-2 d-1 for ρSi and from 4.50 to 9.99 mmol m-2 d-1 for ∫ρDiss), we can generate the same hyperbolic curve (Figure A below); the hyperbolic curve shown on Fig.6 might be an artefact. If the authors want to use Fig. 6, they should discuss this point (variables X and Y which are not independent).

Page 25, line 9-10 : although the data on phytoplankton taxonomy are not shown, it would be interesting to know how the ∫ρSi :∫ρN ratios change as a function of the proportion of diatoms in the phytoplankton community.

Page 26 , section 4.2.4, line 17-24: The authors attribute the unexpected observation (higher ∫ρSi :∫ρN ratios under iron replete conditions, and lower ∫ρSi :∫ρN ratios at station E3) to the dominance of different diatoms populations**.** Here, it would be interesting to have some species names. Are the high ∫ρSi :∫ρN correlated to the dominance of some specific genus or species of diatoms ? Are these species commonly found and preserved in the sediment?

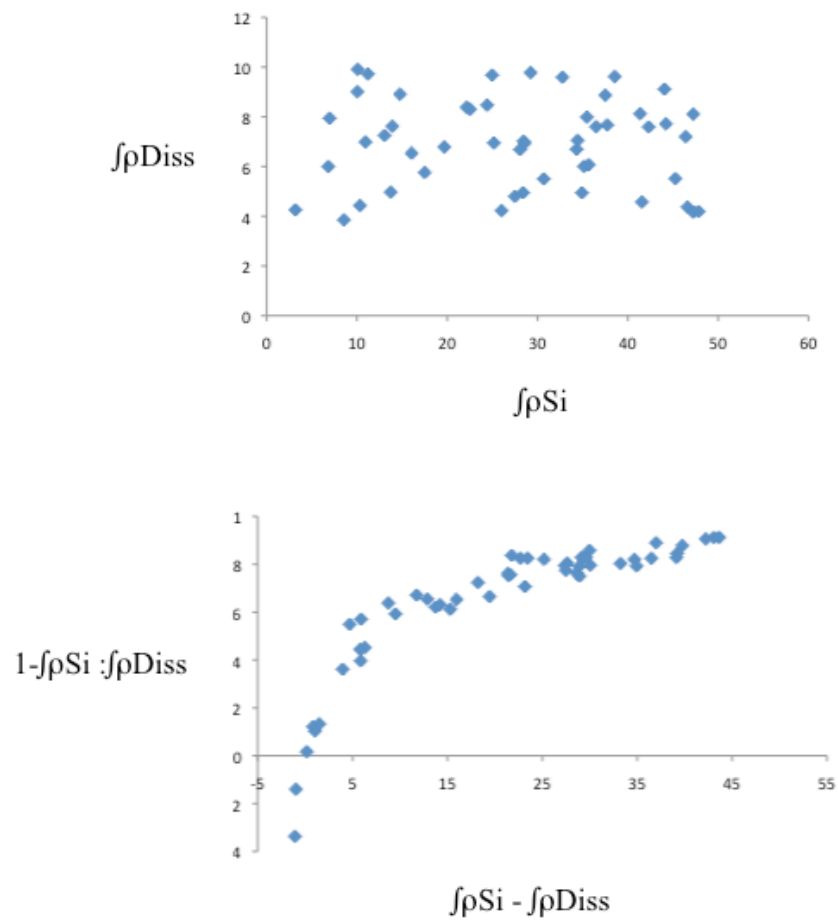Figure A: **(a)** ∫ρDiss as a function of ∫ρSi using a range of random values consistent with data listed in Table 2 (from 3.09 to 47.9 mmol m-2 d-1 for ρSi and from 4.50 to 9.99 mmol m-2 d-1 for ∫ρDiss) ; **(b)** resulting correlation between (1-∫ρSi :∫ρDiss) and (∫ρSi - ∫ρDiss).