

Interactive comment on “Efficiency of the silicate pump at a coastal oligotrophic site in the Mediterranean Sea” by K. Leblanc et al.

K. Leblanc et al.

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1. Proofs :

page 1 in Author affiliation: correspondance to K. Leblanc (leblanc@com.univ-mrs.fr) in stead of leblanc@udel.edu

2. Answers to C. Heinze's comments :

(1). This phrase was replaced on page 1 line 4 to 7 by the following : “The main focus of this paper was to establish an annual budget of biogenic silica export, to describe the seasonnal pattern of Si fluxes in relation to the organic and mineral C fluxes and to quantify the Si/C decoupling processes during sedimentation.”

(2). page 3 line 18 : “strongly hydrodynamic” was replaced by “highly turbulent”.

(3). The bottom depth (162 m) is now documented on page 5 line 3.

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(4). page 5 line 16. DIW was replaced by “deionised water”.

(5). Indeed, the annual mass flux for POC does not follow the same trends as BSi and total mass flux, even though the pattern of the major sedimentation peaks coincide. The first paragraph on page 8 line 10 to 14 was replaced by the following :

“Particulate carbon fluxes patterns showed some similarities with the precedent parameters, with peaks of sedimentation occurring at the same periods, but of varying intensity (Figure 5). Contrarily to BSi and total mass flux which increased in the bottom trap, the average POC fluxes over the sampling period were very similar in both traps, with 26.3 +or- 30.5 mg C m⁻² d⁻¹ at 56 m and 24.3 +or- 35.3 mg C m⁻² d⁻¹ at 142 m.”

(6). The yearly export budgets are indeed estimates, and this section was reformulated as follows on page 15 : “The annual Si and C export flux budgets were estimated for the year 2000 from the bottom trap data, which presented the longest continuous dataset, using the following assumption: the low Si and C fluxes obtained from September 1st to November 15th were averaged to a daily flux and in turn extrapolated to the two gaps in the sample collection in January 2000 (36 days) and mid-November to December 2000 (46 days). The yearly estimates thus amounted to 86.8 mmol Si m⁻² y⁻¹ and 154.9 mmol C m⁻² y⁻¹.”

(7). Indeed, it seems the cut off at 56 m did not affect total primary production much, with a decrease of only 8.5

“The shallow depth of the surface trap could further not explain this increase in mass flux in the bottom sediment trap, as a cut-off at 56 m rather than the bottom of the euphotic layer induces only a small decrease in the yearly integrated primary production (-8.5

(8). The revised manuscript was proofread.

(9). The word SOFi was consistently corrected throughout the manuscript.

(10). Dotted lines were replaced with dashed lines on Figures 3 to 7.

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(11). The regression line in Figure 8 (top) has been replaced by a dotted line to reflect the poor regression fit. As suggested, a third graph has been added to this Figure to expand the cluster of points in the low concentrations values. The scale chosen was 0–0.4 mmol Si m⁻² d⁻¹ and 0–3 mmol C m⁻² d⁻¹ in order to include the whole cluster. The Figure legend has been subsequently changed on page 25.

Anonymous referee 2 :

Minor comments:

page 5 line 16. DIW was replaced by “deionised water”.

Figures :

As suggested, we have added an extra scale for the figures 4 to 6 representing the corresponding fluxes in mmol m⁻² d⁻¹.

Chapter 4 Discussion :

In the revised version we have removed that statement, as after a calculation suggested by the editor, it seems that the surface trap would be collecting a large majority of the produced material. Indeed, it seems the cut off at 56 m (rather than the bottom of the euphotic layer) did not affect total primary production much, with a decrease of only 8.5

“The shallow depth of the surface trap could further not explain this increase in mass flux in the bottom sediment trap, as a cut-off at 56 m rather than the bottom of the euphotic layer induces only a small decrease in the yearly integrated primary production (-8.5

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