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Biogeosciences Discussions

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

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The study by Leblanc et al is interesting and worth publication (after revision for a number of mostly editorial issues) for the following main reasons:

(I) Particle flux measurements in general and shallow sites in particluar are still not abundant. Additional data are important to fill in gaps in our understanding and observational evidence. The paper is well written and the study carried out thoroughly.

(II) The most important statement, I think, is included in the last paragraph on page 562: Clear evidence for a faster recycling of carbon than silicon with depth. Though this is no entirely new message it counterbalances the argument that biogenic silica may have a ballast function for efficient downward transport of carbon.

(III) The study shows the extreme difficulty in determining vertical particle fluxes in

coastal regions (see, e.g., section 4.5 on page 564) due to the high temporal and spatial variability.

A few minor things need to be clarified or corrected before the paper can be published. I ask the authors to address the following issues:

(1) Abstract: “The main focus was to investigate...”. Please, avoid almost meaningless “process goals” such as “...to investigate...”.The authors do much better on page 553 at the end of the introduction in describing the aim of the study than in the abstract.

(2) page 553, 10-15: “strongly hydrodynamic” is not clear (highly turbulent ?)

(3) Though it can be deduced from the rest of the paper: Cite the bottom depth in the first sentence of section 2 on Material and Methods.

(4) Explain the acronym DIW for the non-specialist.

(5) page 557, 20: “strong similarities” is not enirely true. For POC the flux in the lower trap is smaller than in the shallower trap. This is a big difference to the other particle species at the site discussed.

(6) page 558, around 2: “The annual Si export budget for the year 2000 was derived...”: I think “estimated under the following assumptions (explain them)....” is better than “derived”. There are many difficulties in really quantifying the export flux so that an “estimate” - however a useful one - is probably the most you can honestly due.

(7) page 556, top: Can you make an estimate of how much (in percentage) of the primary production you would miss if you wuld make a cut off at 56 m? 56 m is already quite deep and given turbid waters there may not be as much light penetrating down there.

(8) page 561, 5-10: delete one “accurately”. There are some further small inaccuracies, which in part have been repaired by the conversion to the new pdf file from the original manuscript (mismatches in the numbering of subsections) etc. Please, “proofread”

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your manuscript before submission thoroughly.

(9) Write consistently SOFI or SOFi.

(10) The dotted lines (upper trap) in Figures 3-7 are awkward. Please use a dashed line which is easier to read on screen and in print.

(11) Figure 8: The regression line for the surface trap should be drawn dashed only. The correlation between POC flux and BSi flux is realtively poor after all. For the bottom trap, please add a third diagram repeating the correlation analysis for samples in the range 0-0.2 mmol Si m^{-2} d^{-1} for BSi and 0-2 mmol C m^{-2} d^{-1} for POC.

Sincerely, Christoph Heinze

Interactive comment on Biogeosciences Discussions, 2, 551, 2005.