



# ***Interactive comment on “Influence of atmospheric deposition on biogeochemical cycles in an oligotrophic ocean system” by France Van Wambeke et al.***

## **Anonymous Referee #2**

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Comments on the manuscript bg-2020-411: Influence of atmospheric deposition on biogeochemical cycles in an oligotrophic ocean system

This manuscript by Van Wambeke et al. aims at investigating the impact of atmospheric depositions on the biogeochemical properties and processes in the Mediterranean Sea surface mixed layer. For this purpose, the authors present a large amount of data, collected both in the water column and in the atmospheric depositions, along a transect covering both the Western and Eastern basins of the Mediterranean Sea, during the PEACETIME cruise. The authors also presented the results of an enrichment experiment. The strength of this paper, as the authors stated in their conclusions, is that

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it provides simultaneous sampling on both atmospheric depositions and the surface ocean on a large portion of the Mediterranean Sea. Moreover, as the authors highlighted in their introduction, the “in situ” study of atmospheric depositions is very rare due to obvious limitations. For these reasons, I think these data should be published. However, the manuscript still needs a bit of refining. I hope that the following comments will be helpful to the authors.

Main considerations: 1) I understand the difficulty of writing a paper with so many results. However, an effort need to be made to shorten the whole manuscript. In the current form I find it quite hard to read, it is too long, one can get lost while reading it. I suggest the authors try to smooth it and make it shorter. There are long sentences that can be shortened, or written with fewer words.

2) I think that the setup of the enrichment experiment is somehow in contrast with the goal of this paper, which is studying the “in situ” effect of atmospheric deposition. As the authors highlighted in the introduction, these experiments are simplifying the natural system. How can we relate the results of an experiment carried out into a 60 ml bottle with what happens in the natural environment? The authors themselves conclude that the results of the experiment cannot be compared with the “in situ” observations. I suggest removing this part.

3) It is clear that a lot of the results obtained from this cruise/project are presented in other papers that are currently under review in this issue or are being prepared. There is a bit of confusion about some data, reported as results in this study, but at the same time citing other papers (under review or in preparation). In particular, I refer to the following: Lines 418-421, DIP results in Pulido-Villena et al. Lines 422, PP and BP in Maranon et al., 2020 Lines 432-435, LAP results in Van Wambeke et al., 2020 Lines 515-517, Citing the results from Fu et al. The authors should clarify, if the results presented are already been present in the cited papers, they should be considered in the discussion section and not presented as results (and therefore also removed from the methods section). If this is the case, it would also help to make the whole

manuscript shorter and more readable.

4) There are way too many citations of articles that are “in preparation”, I have counted at least 17. Citing a paper that is in preparation is usually not recommended (sometimes even not allowed), the data are not available and there is no guarantee that they will be. These citations need to be strongly reduced.

Minor comments:

Lines 169-172: This information is contained in table 1, they can be removed from the text and cite the table. Please also check that for stations ION and TYR the dates in the methods and table 1 do not correspond

Lines 196 – 198: Define high and low frequency

Lines 405-416: This division in groups could be summarized in a table, to be more clear to the reader

Lines 425 – 427: Integrated PP and BP, how were they calculated? This information is missing in the methods

Paragraph 3.4 is a mixture of results and discussion and extra information that go beyond the results

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-411>, 2020.

**BGD**

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