

Interactive comment on “Functioning of the planktonic ecosystem of the Rhone River plume (NW Mediterranean) during spring and its impact on the carbon export: a field data and 3-D modelling combined approach” by P. A. Auger et al.

Anonymous Referee #1

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***General Comments:**

Manuscript by Auger et al focuses on the impact of cold water lenses on the carbon export in GoL. The manuscript is not well written and not well structured, it is very hard to read and many important results are lost in crowded text. The conclusion part does not reflect the results of the major findings from this research, also the abstract is poorly written. The conclusion part is superficial; it mostly repeats known ideas

C5252

whereas it should provide answers on key factors controlling the organic carbon deposition. For example, results given in Figure 17 should be the core of this research, most pronounced feature is the alternating export patterns between 200 m and 1500 m. Authors mention about canyons but this is not obvious, why does these sharp fluctuations in POC flux occur? Sections 5.2 - 5.4 include important results of sensitivity tests but very hard to follow, this needs to be re-organized in a logical manner.

Although this is an appreciable effort, because the analyses are poorly presented the manuscript needs major revisions before it can be published. At present form it takes too long to read, especially the parts that focus on model-data comparison and sensitivity analyses are very hard to follow. It may help to separate results-discussion-conclusions parts. If the authors believe a revision is feasible, they need to provide the revised version (considering the comments above), before I can provide more detailed comments. Still some specific comments are given below.

***Specific Comments:**

Pg 9041: I wouldn't call this an “innovative” model, maybe a complex model

Section 2.2. It would be good to have a figure that shows biogeochemical model compartments and their interactions (wire diagram)

Section 2.5 Should be shortened

Section 3.2: Authors talk about increase and decreases in nutrient concentrations, relative to what?

Section 5.1 Where is the river mouth? It is hard to follow what is being described in this section. The canyon effect on export needs to be detailed.

Section 5.2 What are MOPs, “floods” were never mentioned before. I cannot follow what is meant in the last sentence here?

Section 5.3 Relative contribution of different phyto groups on export is an important

C5253

results, why this is not given in abstract and conclusions?

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C5254