

***Interactive comment on “Short-term changes in particulate fluxes measured by drifting sediment traps during end summer oligotrophic regime in the NW Mediterranean Sea” by J. C. Marty et al.***

**Anonymous Referee #2**

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General comments:

This paper addresses an important scientific question on short-timescale (hours to days) variation in organic matter flux in marine system, which has been poorly understood. The dataset is solid, including both bulk parameters (C, N, and P) and compound classes such as pigments and lipids. The results are very interesting and have broad implications for study of organic matter cycling. However, there are some unclear interpretations in the paper. For example, the authors made one major conclusion that the short-term sedimentation was largely influenced by the community structure. But how much did the authors know about the community structures of phytoplank-

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ton, zooplankton and microbes? Interaction (rather than structures) between these communities may be the most important factor affecting the particulate organic matter flux and more discussion is needed to address this point. Moreover, the interaction can be influenced by physical conditions such as stratification, wind variation, and day/night change. The authors mentioned several times that the observed POC/PON ratios were always higher than the conventional Redfield ratio (C:N, 106/16 = 6.6), but from Fig. 4, more than 10 measurements showed lower POC/PON ratio ( $<6$ ). Variable POC/PON ratios indicated selective degradation of nitrogen-rich or carbon-rich components but they were selectively not “in part” degraded. The variations of lipid compositions may provide some insights into the interaction between communities but it is very confusing to get clue for exchange between dissolved, suspended, and sinking particles because no any quantitative data were provided for dissolved and suspended pools. In addition, this paper lacks some discussion for inconsistent variation patterns of bulk organic matter and compound classes.

Specific comments:

Abstract:

There are some repeated statements such as “... the settling material was in part degraded” and “... the organic matter ... was reworked ...”. What is definition for “free lipid”?

Introduction:

Some sentences are repeated. For example, the first sentence can be replaced by the sentence on lines 16-17.

Page 578 lines 2-4: this sentence needs to be reorganized to make clear what or who “indicated” that.

Page 578 line 9: “... particles (not particle flux) were collected ...”.

Page 578 lines 11-13: “C, N, and P in the trap samples were measured not measured

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in the traps”.

Materials and methods:

Page 580 line 4: “inorganic forms of C, N, and P . . .”. What are these forms (CO<sub>2</sub>, NH<sub>4</sub>, and PO<sub>4</sub>)?

Page 580 lines 12-14: It is unclear how the internal standard can be used to correct the presence of residual water in the filter.

Page 581 lines 20-22: “. . . the standard deviation of replicate analysis . . . was 6±4%”. What is number 6 here?

Results:

Page 582 lines 7-10: “two principle wind events . . .”. How long did these wind events last?

Page 582 line 11: “desalt water (<38.3)” should be “low salinity water”. What is the normal salinity in the sampling site?

Page 584 line 23: “phaeopigment fluxes” include what pigment compounds (phaeophytin, phaeophorbide, and others?)

Page 586 line 4: “metabolites” what is the definition? What lipid compounds are in this term?

Discussion:

Page 587 line 9: “dissolved di-nitrogen” should be “dissolved N<sub>2</sub>”.

Page 589 lines 4-10: “. . . correlated with the flux . . . (0.42, n=74), . . . (0.49), . . . (0.55), . . . (0.56), and . . . (0.58). What do these number mean? Are they slopes for the correlation lines or r<sup>2</sup>?

Page 589 line 12: “global” should be deleted.

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Page 591 last paragraph: total OC (Fig 3) and total lipids (Fig.7A) showed different day/night patterns. What is the reason for the difference?

Conclusions:

The first sentence should be a general statement including all factors affecting the short-term particle fluxes.

Table1: The details for tracer experiments (methods) should be mentioned. For the unit of ( $\text{mg m}^{-2}\text{j}^{-1}$ ), what does j mean?

Fig. 2: The connected curves between sampling periods should be removed because no data showing the variation trends during these days.

Fig. 3: The title label for nitrogen flux should be consistent to that for carbon flux.

Fig. 4a: The title label should be "POC/PON ratio".

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