

***Interactive comment on* “Short term changes in zooplankton community during the summer-autumn transition in the open NW Mediterranean Sea: species composition, abundance and diversity” by V. Raybaud et al.**

**Anonymous Referee #1**

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The paper presents and analyse a large set of interdisciplinary data showing the impact of the intrusion of low salinities waters on the zooplankton, during the summer autumn transition, in the Ligurian Sea.

Indirectly, the paper address relevant scientific questions within the scope of BG by discussing the control of variability of zooplankton diversity and abundance, which is a major factor in the knowledge of fluxes of particulate organic matter to the ocean bottom. Even if the carbon fluxes are not treated directly, the paper is associated to the project DYNAPROC directly involved in biogeochemistry.

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The methods, tools and ideas are classical for the zooplankton treatment. Moreover the numerous data are original and the mode of analysis, computation and discussion is absolutely rigorous, original and complete. The interpretations are coherent and substantial. The conclusions are supported by a sufficient number of results clearly presented. At my knowledge, no earlier publication study as explicitly the Mediterranean zooplankton summer autumn declining bloom.

In my opinion, the level of the paper corresponds to the top papers which leads to understand the causality of zooplankton distribution and diversity. It merits to be accepted with minor revision.

Some comments:

P2241 line 10. I presume WP11 zooplankton sampling are performed with 200-0m more than 0-200m.

P2242. As the authors said, the computation of species diversity indices requires a taxonomic identification at species level. Its true, at the population level? However, i am not certain that the condition is applied for the BIONESS sample where all the copepod species and development stages are not sampled even if the identification is done until the species. An intercalibration between WP2 and BIONESS would be usefull (in the future).

P2245 line 13. The thermocline deepening was accompanied by a strong cooling of the mixed-layer water and suggests the beginning of autumnal de-stratification. The situation is not typical of autumn but exist for spring and summer strong wind events.

P2245 line 14. The authors declare that LSW water has a coastal origin and crossed the Ligurian front along isopycnals by a barocline instability. What are the arguments that you are using to justify that assumption. I am not strongly convinced by the coastal origin of the LSW1 waters. The copepod species associated with LSW1 are they typical of coastal surface water? Is it not a confusion between "coastal waters" and low salinity

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Ligurian current waters, from Atlantic origin, which extended between the coast and the Front? (Sea Sournia, et al., 1990; Goffart A, Hecq JH, Prieur L 1995. Contrôle du phytoplancton du bassin ligure par le front liguro-provençal (secteur corse). Oceanol Acta 18:329–342). Moreover, a comparison of copepod composition in LSW1 waters with Mediterranean typical coastal waters and Ligurian waters (from the literature) would be instructive to conclude.

P2246 line 3. The bimodal distribution of phytoplankton on the Fig 2d is observed only on the first sampling and not clearly generalised at the beginning of the cruise. What is the method used to determine the phytoplankton identification and especially the senescent diatoms. By HPLC, some pigments, taxonomic indicator can be included in faecal pellets as well as in senescent cells.

P2246 line 13. The biomass are expressed in  $\text{g m}^{-2}$ . It is not specified if it in dry or wet weight? Please precise the sample net used for biomass.

P2247 line 8. Copepodites represent more than 48% of copepods. The Oithona small copepodites are they sampled by WP2 net ?

P2247 line 20. copepod dimension 200-500  $\mu\text{m}$  and not um.

P2248 table 1, 2, 3. May I suggest a quick definition of Z value for table 1, 2, 3.

P2248 line 15. Why the short term variations can be attributed to horizontal patchiness?

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