

Interactive comment on “Zooplankton diel vertical migration in the Corsica Channel (north-western Mediterranean Sea) detected by a moored ADCP” by Davide Guerra et al.

Anonymous Referee #2

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Title

Zooplankton diel vertical migration in the Corsica Channel (north-western Mediterranean Sea) detected by a moored ADCP

Authors

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General comments

The paper by Guerra et al is a study of diurnal vertical migration of zooplankton in

the Corsica Channel observed with an Acoustic Doppler current profiler for a period of about two and a half years. The study produced interesting results about the vertical and temporal variation of zooplankton distribution and its relation to environmental conditions. The introduction and methodology sections are in general well written. However, some important information regarding the statistical analysis is missing in the methodology section. The results and discussion section requires several changes and a few additions, as some of the text is not easy to follow and understand, and some of the text is not clearly supported by the present graphs. The length of conclusions section should be significantly shortened, as it is largely a repetition of the results and discussion section, through a more synthetic writing. As the results are interesting, I suggest publication after the issues presented below are addressed.

Specific comments

1. Although authors appreciate that the MVBS is only a proxy of zooplankton biomass, they use the term biomass to refer to variations in MVBS. Biomass should be replaced with absolute backscatter or another appropriate term to avoid reader confusion, as details regarding their difference are given only in later sections.
2. Results should be presented in the past tense.
3. Please add units that are missing in several figures and use equation editor for the units in figure captions, not text.
4. Please consider adding density profiles to figure 2 and refer to the pycnocline instead of the thermocline when mentioning stratification.
5. Please distinguish between primary (phytoplankton) and secondary (zooplankton) bloom throughout the text (or at least once in each paragraph). In some cases, it was obvious from context which one was meant, in others, it was a bit confusing.
6. p.3, l.21-24: Please consider expanding a bit the discussion on the drivers of DVM.
7. p.3, l.25: van Haren, J. Plankton Res., 2014 and Ursella et al, Deep-Sea Res., 2018

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are two additional ADCP studies on zooplankton in the Mediterranean Sea. Please consider including them.

8. p.3, l.28: “. . .to infer the composition in the Ligurian Sea. . .”. This is incorrect, they only suggest that a change in composition is probable. Please remove.

9. p.4, l.6-8: Please consider including Brierley et al, Deep-Sea Res., 1998.

10. p.5, l.18-24: Please consider moving “The operating . . . (Thomson and Emery, 2014).” to introduction and merge the rest of this paragraph with the next one.

11. p.5, l.32: Do you mean composition instead of “. . .consistency. . .”?

12. p.6, l.1-2: “Therefore, . . . quantitative.” Repetition (also on p.4, l.6). Please consider removing.

13. p.6, l.5: Please consider moving “The four . . . signals.” to the previous paragraph which explain the operation principles.

14. p.6, l.6: Please replace “. . .is upward looking. . .” with “. . .is placed at an upward looking position. . .”. The way is stated, one might understand that this particular ADCP can be used only in an upward looking position, which is incorrect.

15. p.6, l.16-20: This paragraph could be removed.

16. p.6, l.27: Please explain symbols H and θ .

17. p.7, l.1: There is one PG per transducer and an average PG. Which one was used? The average, the minimum of all separate transducers or something else?

18. p.7, l.13: What data were used for the calculation of the absorption coefficient α ?

19. p.8, l.18: Perhaps you meant “. . .complemented. . .” instead of “. . .integrated. . .”?

20. p.8, l.22: Please take also into consideration that large organisms can escape the 200 μm mesh. Moriarty et al, Earth Syst. Sci. Data, 2013.

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21. p.9, l.9: The sentence seems incomplete.
22. p.9, l.12: Please provide more information on spectral analysis. Are the data detrended, windowed, block-band averaged, which is the number of segments for the spectral estimate, what is the segment overlap? These are necessary for the calculation of confidence intervals.
23. p.9, l.15: Please consider replacing “. . .verify. . .” with “. . .investigate. . .”.
24. p.9, l.18-28: “. . .”. Repetition (also on p.4, l.15-24). Please consider removing.
25. p.10, l.4: Please consider moving the DCM definition to p.5, l.10-15 and add some information regarding its variability from literature.
26. p.10, l.10: It is not clear to me which this interface is.
27. p.10, l.18-23: I think that “Vertical . . . range.” should be moved to methodology.
28. p.10, l.26: “All considerations . . . bottom.” Repetition (p.7, l.3-4). Please consider removing.
29. p.11, l.3: The daily cycle is embedded in the plot, but it is not distinguishable. Please consider including a representative subplot with time span of a few days.
30. p.11, l.7: “June-July 2016”. I think it’s around April, not June-July.
31. p.11, l.9: “. . .a pattern . . . organisms.” Please add reference.
32. p.11, l.22: “. . .daily values are slightly higher than nocturnal values. . .”. Please include a supporting graph or mean daily and night MVBS values.
33. p.11, l.33-34: Please include a plot of integrated MVBS as the argument is not evident from figures 3 and 4.
34. p.12, l.3: I think it’s “. . .intra-annual. . .” instead of “. . .interannual. . .”.
35. p.13, l.5 and figure 4c-4f: Since light intensity was found to be the governing factor

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controlling DVM (e.g. figure 3), the x axis should be hours relative to sunrise and sunset instead of hour of the day for the W ADCP to be more representative of actual zooplankton migrating velocity. Qualitatively, the results will be the same as those in figure 4d and 4f, but I expect that the duration of upwards and downwards motion will last less time than is shown in the present plot. Please consider, either including a plot with such an x axis, or adding some text explaining that the vertical velocity values are not optimally presented in this plot.

36. p.14, l.4: “. . .or does not involve a large number of organisms.” This applies only (and partially) to MVBS spectra. The way it is stated both MVBS and W are meant, which is incorrect.

37. p.14, l.6 and 8: The smallest annotated period in figure 5 is 4.45 hours. It is 4.75 hours in the text.

38. p.14, l.30-31: “The community is essentially composed by organisms that do not migrate significantly. . .”. Please add reference.

39. p.15, l.10: Please replace “. . .which is accompanied. . .” with “. . .which is possibly accompanied. . .” as the lack of surface data hampers further investigation.

40. p.15, l.11-12: Please add reference.

41. p.15, l.17: Is the distinguish between shallow and deep layers based on the photic layer depth or on another criterion?

42. p.15, l.27: “. . .that well correlate. . .”. The Chl- α and MVBS time series should be pre-whitened (i.e. remove autocorrelation) before a conclusion is drawn regarding their degree of correlation.

43. p.15, l.32: Please consider replacing “. . .a surface value. . .” with “. . .an exponentially weighted near-surface value. . .”.

44. p.15-16, l.29-13: Please consider placing the part of literature that sup-

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ports/contradicts the findings of this study at the beginning of the paragraph and then present possible explanations for this agreement/disagreement. I was confused.

45. Conclusions section: I think that this part should be rewritten to avoid repetition of results. Instead, the relation of the results of the present study with the relevant literature should be stressed. Also, the length of this section should be substantially shortened.

46. figure 1: Please include information about the data set of SST field in the data availability section.

47. figure 4a and 4b: The x axis is month or climatological month? It was not clear to me from the text. If climatological please add this to the axis label. Otherwise, state which year the plot refers to.

48. figure 5: Please add confidence intervals. This is particularly important for the low-passed series (5c and 5d) and subsequent interpretation of results.

49. figure 6a: It seems redundant to me as the three numbers in this plot are already present in the text.

50. figure 7b: Please add confidence intervals.

51. table 1: Please explain symbols in table caption or replace B, L, D, C with blank distance, etc.

52. table 2: I think that this table is redundant, as the useful information of taxonomic analysis has been already presented in the text. Please consider removing.

Technical corrections

1. Please add the data availability section that is missing (required by journal).

2. Bibliography is not formatted according to journal standards. Number of volume and pages are missing. Also, doi representation is not consistent among references (some

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are doi: . . . others are https://doi...).

3. p.3, l.16: Please merge the two sentences or rephrase.
4. p.4, l.5: “. . .by the depth of the depth. . .”. Typo.
5. p.4, l.7: “. . .attempts to calibration. . .”. Typo.
6. p.4, l.17: “. . .Data collections. . .”. Typo.
7. p.4, l.22: Perhaps replace “. . .is completed by. . .” with “. . .concludes with. . .”?
8. p.5, l.18: Please replace “. . .as sediments. . .” with “. . .such as sediments. . .”. Typo.
9. p.6, l.5: “. . .increments to each other. . .”. Typo.
10. p.6, l.28: #7 deployment is missing. Typo.
11. p.7, l.3: Perhaps replace “. . .will be done. . .” with “. . .will be made. . .”?
12. p.9, l.15: Please consider replacing “. . .results to be. . .” with “. . .is a relevant. . .”.
13. p.9, l.31: Please replace “. . .servicing. . .” with “. . .mooring maintenance. . .”.
14. p.9-10, l.31-3: please consider merging the two sentences.
15. p.10, l.1: “. . .are representative of. . .” instead of “. . .represents. . .”. Typo.
16. p.10, l.4: “. . .in correspondence with. . .” instead of “. . .in correspondence of. . .”. Typo.
17. p.11, l.24: Perhaps replace “. . .much lower.” with “. . .much weaker.”?
18. p.14, l.4: “. . .take place. . .” instead of “. . .take places. . .”. Typo.
19. p.14, l.24: Please consider replacing “. . .by far the most abundant group were the copepods. . .” with “. . .the copepods were by far the most abundant. . .”.
20. p.14, l.29: Please consider removing “more” in “. . .more western. . .”.

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21. p.15, l.3: Please consider replacing “. . .more superficial. . .” with “shallower”.
22. p.15, l.9: “Fig.” instead of “fig.”. Typo.
23. p.15, l.26: “. . .are shown. . .” instead of “. . .is shown. . .”. Typo.
24. figure 1: Please change “IW=Intermediate Water” to “IW=Intermediate Water pathway” or something similar.
25. table 1. “. . .-400 mis. . .”. Typo.

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