

## **Reviewer 1**

We would like to thank the reviewer for the hard work invested in reviewing our paper and the overall very positive view on it (manuscript os-2021-124). We have gone over all of the issues raised and revised the manuscript accordingly. These comments provided much assistance with reshaping and clarifying the manuscript. We hereby present point-by-point answers to the issues raised by the reviewers. Our answers are in blue.

Moderate revisions

### **General comment**

This paper aims to describe the impact of cyclonic and anticyclonic eddies on the primary productivity, bacterial productivity and plankton biomass in the southeastern Mediterranean Sea. The paper is well written, in some passages a little too long, but still easy to follow. The Figures are generally clear but some of them can be improved as suggested in the specific comments. The biological and biogeochemical aspects are very detailed, with extensive discussions well placed in the context of previous literature. On the other hand, the physical part is not so accurate. It is quickly described only in the Results Section and are not included in the Discussion Section and not even linked to the results of the biogeochemical parameters. The manuscript should also include a short final paragraph summarising the main conclusions and new findings of this work.

**Reply:** We thank the reviewer for his/her comments and suggestions. We have specifically clarified the physical part where needed, added some relevant discussion and improved the resolution of some figures.

We believe that adding a final paragraph with the main conclusions/ new findings may be repetitive and length the manuscript even more so than it is now without a real scientific-based necessity.

### **Specific comments:**

Title: This paper provides a snapshot of two structures, one cyclonic the other anticyclonic, sampled in the late summer of 2018. The current title is too pretentious, suggesting an

analysis that is more comprehensive and extended in time. I suggest adding at the beginning of the title "On the influence..." or at the end of the title "...in late summer 2018".

**Reply:** We revised the title as suggested by both reviewers. The title now reads: *“Influence of cyclonic and anti-cyclonic eddies on plankton in the southeastern Mediterranean Sea during late summertime”*.

Results: The AMEDA algorithm finds Argo float traces (grey lines in Figure 1) within both the cyclone and the anticyclone examined in this paper. These data could be useful to describe the temporal evolution of thermohaline characteristics in these structures before and concurrently to the analysed period, to confirm the presence of upwelling and downwelling within them and/or the flux of cold waters upwelled south of Cyprus into the cyclone #11988.

**Reply:** We have added this information in the revised manuscript: *“...Later, when the DYNED atlas was extended to include 2018, it was identified as cyclonic eddy #11988 that was created more than a year earlier, mid-September 2017 (Figure S2). It was split from cyclone #11310 located south of Cyprus and migrated to the easternmost SEMS. Profiles of Argo floats (#6903221 and #6903222) localized within cyclone #11310 showed that it brought denser, colder and saltier water upwelled on the southern Cyprus coast (Figure S2A)... ”* (Lines 295-300).

Line 290: Please add a short description of the SST maps in Figure S2, highlighting the upwelling along the southern Cyprus coast and the following spreading of cold waters in the SEMS.

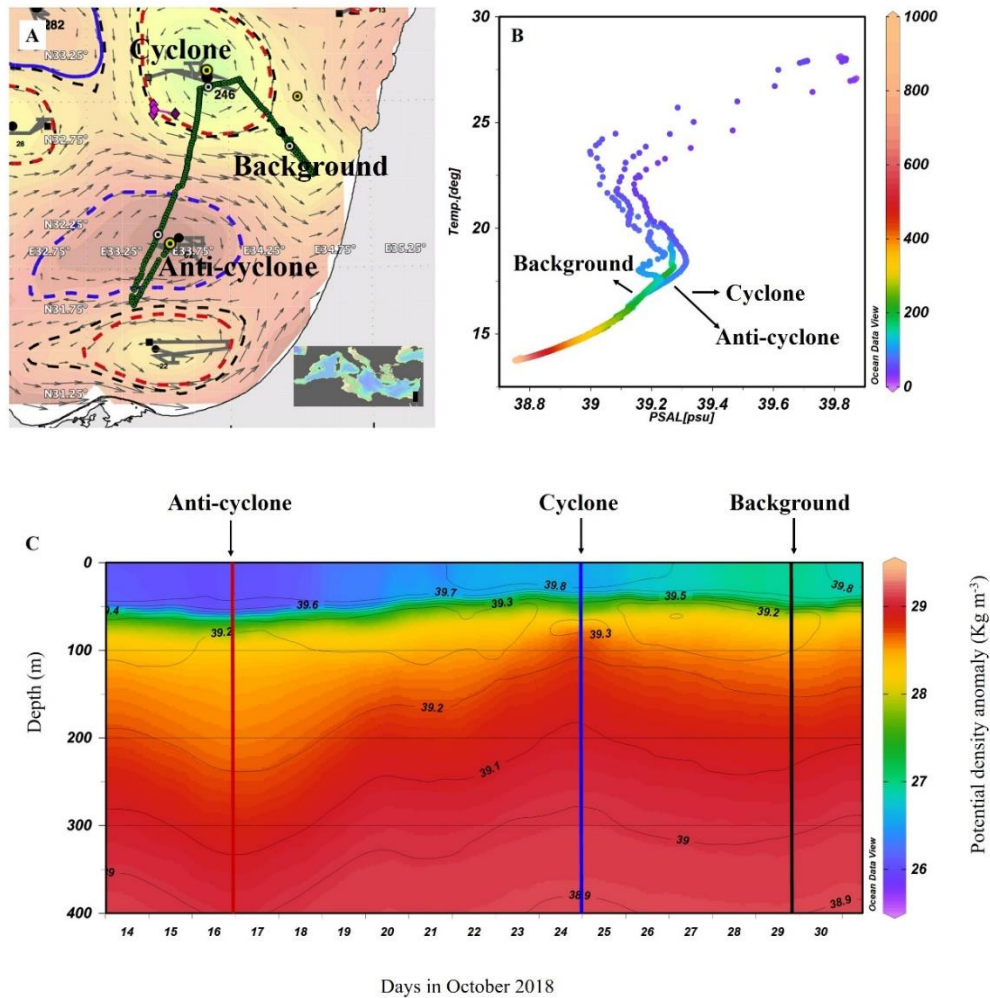
**Reply:** We now describe in more details that the upwelling at the southern Cyprus coast and its associated cold water spread as a cold-core cyclone: *“...cyclone #11310 showed that it brought denser, colder and saltier water upwelled on the southern Cyprus coast (Figure S2A). At the time it was sampled it is characterized as a cold-core cyclone, colder than its surrounding waters (Figure S2B)...”* (Lines 298-301).

Line 297: The cyclone #11310 is not shown in Figure S2.

**Reply:** Cyclone #11310 (25-Nov-2016 to 29-Sept-2017) dates prior to cyclone #11988 (first detection 15-Sept-2018) and therefore is not seen in Figure S2 that shows SST for 11/08/2018 (A), and 12/10/2018 (B). We removed the reference to Figure S2 in the revised manuscript.

Line 310: Remove the isopycnals from Figure 1d and overlap the corresponding isohalines on the density contour. This will make the properties described in lines 315-317 much more evident to the reader.

**Reply:** Agree – the figure was revised as suggested:



Figures 1b, c: Increase the quality of Figures and their sizes (insets are very hard to read). My suggestion is to replace these figures with Figure S3 (e.g. with profiles coloured by depth) and move them in the supplementary materials.

**Reply:** We agree with the reviewer and revised the figures and corresponding text accordingly. Where, we moved the vertical profiles of temperature and salinity to the supporting information (new Figure S3) and added to Figure 1 the T-S profile colored by depth as suggested. We also improved the resolution and quality of the figures. Please see Figure 1 in the comment above and Figure S3 below.

Figure S3:

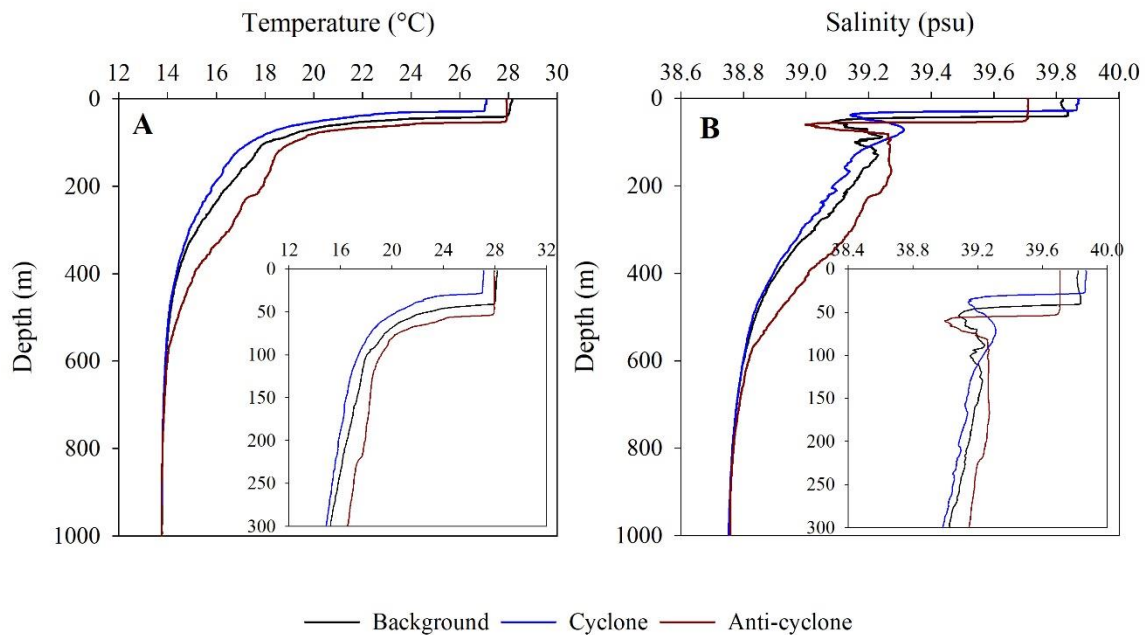
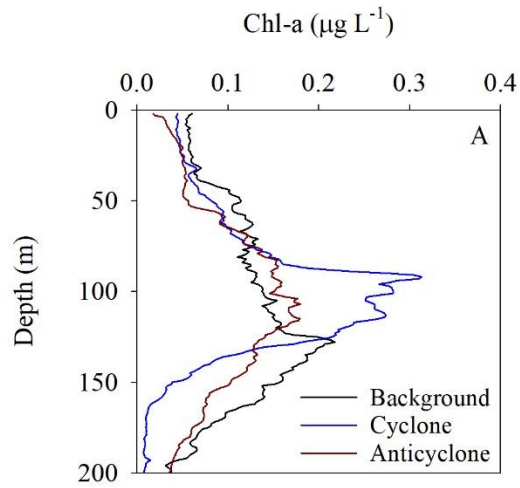


Figure 3a: add symbols to identify the anticyclonic, cyclonic and background conditions.

**Reply:** The chlorophyll-*a* data is measured continuously every meter on average, similarly to the T-S profiles, by a fluorimeter (calibrated against *ex-lab* pigment extraction). Adding symbols will result in unclear profile design-wise (that is, too many data points). To avoid confusion, we added a specific legend in panel 3A.



Figures 4, 5, S4, S5: Increase the quality of Figures

**Reply:** We have revised the figures which now has a better resolution and thus quality.

Note that the figures uploaded to the OS platform are in in the journal's requested format.