

Reply to Comments from Anonymous Referee # 2

The comments are in *Italic* and the replys are in Roman fonts. The line number refers to those in the revised manuscript, not in the track change.

I thank the authors to have done a very good job in improving the clarity of the figures as well as adding more explanatory figure captions, and usually adequately modifying the draft. I am however not fully satisfied by two of the replies provided.

The first on relating to OISO station 11: ‘This may not interest as much the authors, as it is mostly T, S, O₂, DIC, TA, and sometimes, NO₃, Silicates (rarely PO₄). On the other hand, it could be nice to check some of the trends mentioned in the last section.’ This answer (‘not included as at more than 20 km’) is not very satisfactory. I don’t think that the data need to be included, but cross-referenced / compared, in case this is relevant (trends can be estimated from those data, and have been estimated). If it is not relevant (too different water masses, for example), this would need to be provided in the response.

We compared only temperature and salinity (see Appendix A), not oxygen, nutrients and carbons. For temperature, Purkey and Johnson (2010, Journal of Climate, <https://doi.org/10.1175/2010JCLI3682.1>) estimated that the horizontal decorrelation length is approximately 160 km. OISO station 11 (56.5°S, 63°E) is much farther apart from our section than 160 km and it seems impractical to compare temperature between these two stations. The same reasoning applies to salinity.

Also, on the comment to the ‘Andro’ Argo current product: ‘We did not try plotting the same figure from ANDRO, but ther document (Ollitrault and Rannou, 2013) convinces us that the plot will be similar’

This is reassuring. I have recently been alerted that the number of data included in the SIO product and the Andro product are rather different (more in Andro, at least in the updated version). This points probably to differences in the data selection/processing/quality control. Thus, it might be good to mention that this has been checked with similar results.

For reference, we now made the plot. We do not know the reason but generally Andro shows weaker EKE’s. Since the distributions are similar and does not change our statements about the spatial contrast of EKE at 1000 dbar (LL.39-41), we think it is beyond our scope to discuss the difference in this manuscript.

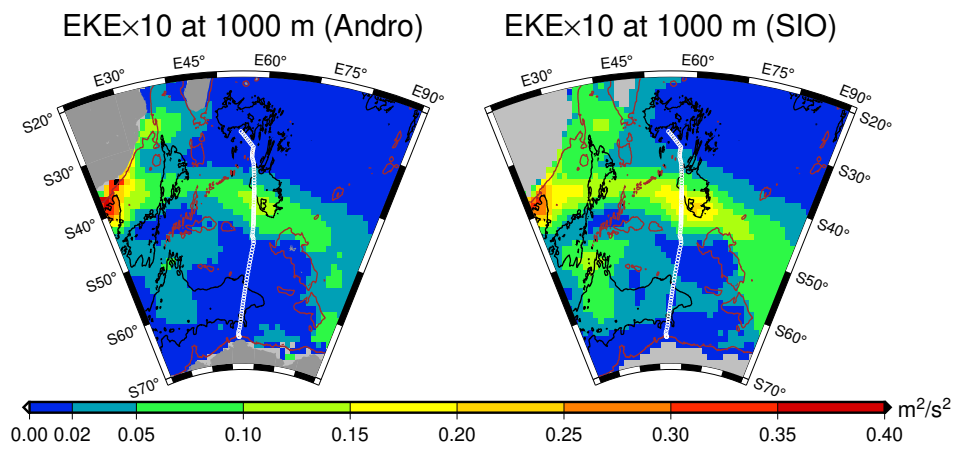


Figure 1: Eddy kinetic energy at 1000 dbar with two products of Argo drift velocity.

Minor editorial comments on revised manuscript: I noticed two typos that need to be corrected in the revised manuscript with track changes:

- *l. 76 ‘... station numbers...’*
- *l. 79: ‘... to attempt...’*

We thank the reviewer for careful reading.

Reply to Comments from the Editor

The comments are in *Italic* and the replys are in Roman fonts. The line number refers to those in the revised manuscript, not in the track change.

At many places in the text: Positions do not get parentheses.

The parentheses were removed.

I think the subsections in the introduction are not common and in this case also not necessary.

Subsections in the introduction were removed.

L19-20 “The GO-SHIP (Global Ocean Ship-based Hydrographic Investigations Program) section I07S is the latest occupation.” Reading this I expected to read the year of occupation.

Changed to “The GO-SHIP (Global Ocean Ship-based Hydrographic Investigations Program) section I07S is one of these sections and occupied for the first time in the austral summer of 2019/20.” (L.18–19)

L41 Not sure if “negotiate” is the correct word here. L238 again “negotiating” seems not the right word here. It is not clear what is meant

Before submission, the manuscript had been checked by native English editing services. None of them have left a comment here. I have also looked up a dictionary (Oxford Advanced Learner’s Dictionary) and ”negotiate (v) 3.(formal) to successfully get over or past a difficult part of a path or route” applies here (L.39). We chose to change the latter to ”flow through”, however (L.238).

Section 1.2 about eddies does not seem to belong in the introduction. It shows results of your work, which is not very usual. This might find a better place in the results section.

This figure is a reproduction of a past work done elsewhere (Katsumata, 2017) and we would rather not include this result as part of the present research which targets the outcome of the cruise. This figure is referenced from the 3rd paragraph of Introduction (LL.39–43).

Section 2 Data: Additional data are shown in this paper, namely DO and transient tracers. Please add information about these in this section, like methods, precision/accuracy.

We have also used nutrients. Relevant remarks are added (LL.70–74).

Caption Figure 4: conservative temperature, absolute salinity and dissolved oxygen do not get capitals

Conservative Temperature and Absolute Salinity need to be capitalised. See Editorial at <https://doi.org/10.1175/JPO-D-13-082.1> in *J.Phys.Oceanogr.* volume 43 issue 5. We agree with the editor that DO should not be capitalised and corrected accordingly (Caption to Fig.4).

L280-285 Please check whether the different data providers would request a fair data use statement

We do not exactly understand what the editor means by "fair data use statement" but we have double-checked "how to cite"s for each database and followed the instruction therein (LL.280-287).

- *L144 flank instead of flak (typo)*
- *L170 delete: unit*
- *L192 delete one: are*
- *L385 Reference Johnson 2008 is incomplete*
- *L402 Please add volume and ages: vol 54, pages 1105-1120*
- *L449 Please add volume and paper number: 129, e2023JC019847*
- *L413-414 delete: "BROKE-West" a Biological/Oceanographic Survey Off the Coast of East Antarctica (30-80°E) Carried Out in January-March 2006, 2010"*

We appreciate the editor's careful reading. All these typos are corrected.

This is such an embarrassment but the first line of the abstract "December 2018 to January 2019" should have been "December 2019 to January 2020". We also found a coefficient "1.66" was missing in front of [SO₄]. These were corrected.