

Major Comments

- *1) The near-shore nutrient-rich water west of the EAC jet has been attributed to upwelling (L272), but I am not fully convinced that it is the cause because it is not shown. Can this be shown using data below 200 m (L12 refers to >200 m, but the results presented are restricted to the upper 200 m)? Or is this attribution a speculation based on previous knowledge? In the case of the Kuroshio (Hayashida et al. 2023), it was attributed to the uplifting of nutricline that makes sub-surface nutrient-rich water accessible to the surface via winter convective mixing.*

We appreciate the reviewer's insightful comment. After reviewing Hayashida et al. (2023), we will be including an analysis of nutricline depth in our manuscript. Some initial analysis shows that similar to their findings, we observe a shoaling of the nutricline during the offshore mode, with mean nutricline depths of approximately 350 m in the inshore mode and 200 m in the offshore mode. While our dataset doesn't allow analysis of seasonal MLD variability, we will use observed gridded products and reanalysis products to investigate the dynamics that results in nutricline depth variability and determine whether convective mixing plays a role. We believe this will greatly improve our manuscript.

2) The findings about the inshore and offshore modes (L12-14) need to be supported by improved figures. The transect figures (Figures 4,6,7,9) show the inshore and offshore composites of nutrients but none of these show the corresponding locations of the EAC jet, which makes it difficult to understand the relationship between the EAC jet position and the nutrient distributions. Would it be possible to add the locations of the inshore and offshore EAC jets based on composites to these figures? Furthermore, while Table 2 is useful for understanding the probability distribution of inshore vs offshore modes, it would be also useful to produce time series of the longitudinal location of the EAC jet (similar to the Kuroshio axis time series such as Figure 2a of Hayashida et al. 2023). This will help better understand the temporal variations in the EAC jet and link with climate variability such as ENSO (L250).

We will be incorporating composite velocity contours into the transect figures and add a time series of the EAC jet position (for sampled days) to Figure 3. However, we have opted to remove the discussion of ENSO from the manuscript. Given the sparsity of the data, we believe that additional time series may not provide any useful further insights.

- *3) Introduction contains a lot of useful background information on the jets that governs the EAC and extensions. Many numbers (latitudes) are mentioned, but it would be helpful to visualize these details. Figure 1 can be zoomed out to include these details with arrows and lines? It can also denote 154.2 E along the transect used for the jet position definition (L117).*

We will be making several revisions to Figure 1. We will retain the original scale of Figure 1, but it will now serve as a subplot to the figure. The second subplot will be zoomed out to show all currents mentioned in the introduction. Following the reviewer's suggestion, we will also mark the line for 154.2° E on the original Figure 1.

Particular Comments

- *L20-21: Consider citing a reference relevant to this sentence.*

We will add citations for reviews of the EAC and water masses/circulation of the southwest pacific.

- *L58: "coastal" is adjective. Suggest adding a word after it or use "coast" instead.*

Fixed.

- *L84: "intensification zone". It would be helpful to indicate this zone in an introductory figure.*

Instead of creating a separate introductory figure, we will add a subplot to Figure 1 that includes surface currents. Alongside the definition provided in the introduction, this addition should clarify the location of the intensification zone.

- *Figure 1: The caption says "black triangles" but they are yellow in the figure.*

Fixed.

- *L104: Suggest deleting "depth" at the end of the sentence.*

Fixed.

- *L106: This reasoning only supports the claim for phosphate limitation. Any reference for nitrate limitation?*

Yes, we will add references that examine nutrient ratios and utilize nutrient enrichment experiments to demonstrate nitrate limitation.

- *L107: This sentence is a bit awkward; silicate limitation could be due to large uptake of silicate by these diatoms. Suggest rephrasing something like “Siliceous diatoms dominate ... that contributes to silicon limitation in this region”.*

We will edit for clarity.

- *L112: Suggest adding a few words to briefly describe the density-based procedure.*

We will add a description to provide more context and further details regarding the methods employed in the Holte and Talley (2009) algorithm.

- *L113: “grouped by season”. It is unclear which months are considered as which season. This could be indicated in Figure 2 caption. (*I noticed these are mentioned later in L131, but they should be mentioned here at first appearance).*

Yes, we will add the months included in each season to the text and to the Figure 2 caption.

- *L114: “qualitative”. I think this definition is rather quantitative. It seeks the longitude at which the southward velocity between 40-100 m is at maximum.*

We will edit for clarity.

- *L116: “was between 40-100 m” should be “between 40-100 m was” because the former sounds like the strongest flow can be located beyond the 40-100 m range, but the method looks for the strongest flow within the 40-100 m range, correct?*

Fixed.

- *L113: The definition of the inshore/offshore mode is a bit awkward and can be written more simply, something like “The EAC is considered as an inshore mode when the strongest southward flow between 40-100 m along the CTD transect is located west of 154.2E. Otherwise, it is considered an offshore mode”.*

We will be editing this section to simplify the mode definition.

- *Figure 2: Markers (a,b) and lines (c,d) often overlap, which makes it difficult to visualize the density of the data coverage. Suggest fine-tuning the figure with the transparency parameter (“alpha” in Python) for markers and lines.*

Fixed.

- *Figure 3 b and c: Since the rest of the analysis is based on the inshore and offshore composites, would it be more consistent and robust to show the composites in these panels too, instead of an example transect?*

While this is a valid point, the significant variability in the offshore mode may complicate the interpretation of a composite, as there is no distinct EAC jet. After considering both options, we concluded that an example day provides clearer definitions of the modes. However, we have added the composite data to the transect figures (Figures 8 and 9) for additional context and are considering adding a second column to this figure with the composites.

- *L144: The past tense “was” is used twice, whereas the rest of the section uses present tense. Suggest changing “was” to “is” for consistency.*

Fixed.

- *Figure 4: The caption says “upper 200 m” but the y-axes are given as “pressure”. Also, the widths of the left panels are narrower than those of the left and right panels as they are squeezed by the presence of the colorbars. It is also hard to read the longitudes as they are close to each other (some possible solutions are to: reduce the number of decimals displayed, tilt the labels, or use fewer ticks/labels). The same goes for the subsequent figures displaying the vertical distributions.*

All points here will be addressed in revised figures.

- *Figure 5: It took me a while to figure out what the grey circles represent. It is a bit misleading to label panel A as autumn, but it shows for other seasons too (and the same goes for other panels). While I understand the benefit of showing all data in grey as background, these panels (A/C/E and B/D/F) are easily comparable without the grey circles because they are shown using the same x and y axes. Therefore, I would suggest removing the grey circles for potential confusion. Also, the caption refers to the isopycnal lines as “light grey”, but they look more like black. Suggest referring to these lines as “black dotted lines”.*

We respectfully disagree on this point. Although the panels are adjacent, we find that including the grey points representing "all data" makes it easier to clearly identify changes between seasons in the TS plots, providing valuable context for comparison. This is also common practise in the literature. We will add further clarification in the figure caption to mitigate any confusion.

- *Figure 6: Why does the colorbar for nitrate include negative values? Also, the colors range from light to dark for nitrate and phosphate, whereas it goes from dark to light for silicate, which makes the visual comparison counterintuitive. The same goes for Figure 9.*

We will adjust all colorbars.

- *L155: Figure 8 is cited before Figure 7. In this case, the order of these figures should be switched.*

Yes, Figure 7 and 8 will be switched.

- *L157-159: It is unclear whether these sentences are referring to Figure 8 or Figure 6.*

This refers to Figure 8. We will add additional figure references for clarification.

- *L167 and L170: Missing the closing brackets for the figure citations.*

Fixed.

- *L182: “was” should be “is” for consistency with the rest of the text in the section?*

Fixed.

- *L184-L186: Suggest deleting this paragraph, because it is based on the results not shown and also because part of the results is already mentioned in L175-L177 and the range can be inferred from Figure 7.*

We respectfully disagree with the reviewer on this point. We find this to be useful information, however we will significantly shorten the paragraph and combined it with the description of Figure 8 for better integration with the relevant results.

- *Figure 8: It would be helpful to provide a description for violin plots, as I think not all Ocean Science readers are familiar with violin plots, which seems more complex than others like Taylor diagrams or box plots. At the least, please provide the reference where readers can obtain the necessary information to understand these plots.*

After consideration, we have decided to go a different route and change the violin plot to boxplot, which more clearly represents the data and matches the interpretations in the text. We will modify the text appropriately.

- L205: *“the average properties of the water column” is unclear. Which properties (temperature?) and what does it mean by “average”?*

This will be edited.

- L207: *“we see evidence of upwelling” is unclear. Was such evidence shown in Results?*

This section will be rewritten to clarify our point more effectively.

- L210: *“meaning that upwelling in the offshore mode results in higher ...” requires information on the vertical location of the nutrient rich water, rather than the horizontal location mentioned in the previous sentence.*

Similarly to the previous point, this section will be rewritten.

- L249: *I am not sure if it is ok to bring the not-shown-results into discussion. Is there a reason for not showing the results in the paper? I think it would be beneficial to show such time series comparison even though the lack of temporal coverage. If page limit is an issue, it can be included as supplementary information.*

We have opted to delete this section entirely, as it diverges too far from the main message of the manuscript.

- L272: *“. M” should be “, m”*

Fixed.