

## **Response to reviewer for technical correction:**

We thank reviewer for reviewing again our manuscript and for pointing out several technical issues. We have addressed all comments as described below. Reviewer's comments are italicized, our responses are in normal black font, citation from the manuscript are in blue font, ~~strikethrough~~ text was deleted, and new sentences that were added in the revised version, in response to reviewer comments, are shown in green font text.

Note that we changed the figure and table numbering by modifying table 1 into a new figure 1 to allow the display of islands geomorphic type pie charts (which is not allowed in tables for final formatting).

*The revised version by the authors substantially improved the manuscript. I have just a couple of technical corrections that should be addressed.*

*Lines 221–223: A sentence was repeated.*

We deleted one of the repeated sentences:

~~*These large IMEs commonly encompass numerous smaller islands, each of which may generate its own local IME superimposed on the broader signal of the main island.*~~

*Line 322: The authors identify as "island mass effect" the change in [PPC]/[Chla] and in [Chla]/[Cphyto] due to a seamount. It is incorrect to define this as an island mass effect since there is no island. A couple of references about the seamount effect include:*

*<https://www.nature.com/articles/s41598-020-69564-0>*

*<https://www.sciencedirect.com/science/article/abs/pii/S0141113620301410>*

*<https://www.science.org/doi/full/10.1126/sciadv.adk6833>*

Submerged seamounts shallower than 30 m are treated like islands in this analysis, following the detection method from Messié et al. (2022) and Bourdin et al. (2025). We realized this information was not repeated in the method section of the submitted version of the manuscript. We have added the following sentence in section 2.6 Island Mass Effect Detection of the method to clarify that shallow seamounts are treated as islands in the detection algorithm:

*Following methodology from Messié et al. (2022) and Bourdin et al. (2025), submerged topographic features shallower than 30 m are treated as islands in the IME detection algorithm; therefore, the term IME can also be used in this study to qualify enhanced [Chla] zones associated with seamounts.*

And adjusted the paragraph in question adding the suggested references:

*The inbound transect to Fiji crossed an IME episode associated with a submerged seamount located north of Fiji and not connected to the island shelf (15°39'38.2" S, 175°51'59.8"E; the IME is visible in the inbound panel of Fig. 5 but is outside the domain of the zoomed maps in Fig. 6). This IME episode was also characterized by a synchronized decrease in [PPC]/[Chla] and an increase in*

*[Chla]/[Cphyto], consistent with the entrainment of low–light-adapted phytoplankton into the surface layer. This pattern suggests enhanced vertical mixing around the seamount, likely driven by the interaction between ambient currents and the seamount topography (Lueck and Mudge, 1997; Wang et al., 2024; Dai et al., 2020; Leitner et al., 2020).*

*Table 2: Capitalize "chlorophyll" in the "Normalized chlorophyll b" description.*

We capitalized “Chlorophyll”

*Line 305: A "(" is missing right before the geographic coordinates.*

We added the missing parenthesis.

*Redundancy between lines 338–339 and lines 441–443.*

We do not consider lines 338–339 and 441–443 to be redundant, as they address complementary aspects of the analysis. Lines 338–339 focus on the spatial variability of  $\Phi_{Sat}$  relative to upwelling indicators and the island shelf to infer potential sources of iron enrichment. In contrast, lines 441–443 examine the temporal variability of IME-averaged  $\Phi_{Sat}$  and biomass indicators over the six-month time series to identify co-variations between iron stress and biomass increase.

*Table 4: Uniform cell borders within the table.*

Table 4 (now table 3) was created in LaTeX, we double checked the code, the cell borders within the table are already uniform. Tables in pdf format may display differences between cell border thickness within a single table at a specific zoom level, especially between colored and noncolored cells. We believe this behavior caused the artifact observed by the reviewer.

**End of response**