

**SP-2023-28 Submitted on 02 Aug 2023**

**Reply to the reviewers. Third round of reviews**

**“Variability of manometric sea level from reanalyses and observation-based products over the Arctic and North Atlantic Oceans and the Mediterranean Sea”  
by Andrea Storto, et al.**

We thank once again the reviewer for the careful reading, the encouraging comments, and the suggestions to correct concepts and sentences in the manuscript. We report below a point-by-point answer to the Reviewer’s comments (Reviewer in black, our reply in red).

## **Reply to Anonymous Reviewer 2**

### **Main comments**

- In relation to one of my previous comments (comment 3 on Section 2.4), the authors responded by stating that the majority of the subannual signal can presumably be attributed to seasonal variations. They mentioned that this assumption is discussed in the text, but I was unable to locate it. Could they guide me to the specific section? Alternatively, if this explanation is absent, they should incorporate it into the text.

Added in the first paragraph of section 2.4

- L15: the first letters in "global reanalysis ensemble product" should be capitalised.

Corrected

- L20: I think it would be better to substitute "is well explained" with "resembles". "Explained" might give the impression that the global barystatic sea level variations force sea level variations in the North Atlantic.

Changed to “highly correlated”

- L24: I do not know if "than in comparison with" is grammatically correct. In any case, it would sound wordy and redundant. The authors could remove "in comparison with".

Corrected

- L35-44: I recommend that the authors partly rewrite the first paragraph of the Introduction. The first line of the introduction explicitly refers to interannual variations. However, the first paragraph does also refer to longer timescales.

Also, the authors state that interannual sea level variations can be decomposed into a steric and a manometric component. However, this should be true at all timescales.

We have removed “at the interannual timescale”.

- L35/36: The phrase "changes in density-driven variations in sea level" contain both the word "changes" and "variations". One of the two should be removed.

We have removed “changes”

- L143: Could the authors check whether "CGLORS" should be written "C-GLORS" instead?

Corrected

- L167: The "b" in "Bootstrapping" should not be capitalised.

Corrected

- L197: I am not sure if I can locate the part of the text where the authors explain the meaning of "mean uncertainty" and where they explain how they calculate it. Could they help me locate the specific line? Is it in the caption of Table 2? Or, if it is missing, could they include this explanation into the main text?

Added in the text, defined as the time-averaged uncertainty of each product, defined in turn as ensemble spread as specified in section 2.4

- L211: "Here, the manometric trend accounts for about 60-80% of the total sea level trend, depending on the specific product used." With "total sea-level trend", do the authors refer to the barystatic sea level trend?

We referred to the total (barystatic + steric) sea level provide by altimetry. Now explicated in the text to make it clear

- L213-L214: I think that a parenthesis is missing after "Table 3" and that one parenthesis should be deleted after "considered".

Corrected

- L220: The "s" in "strait" should be in capitalised.

Corrected

- L228: I think that "decomposing the full signal" should be followed by "into", not "in".

Corrected

- L247: maybe "possibly due" is better than "due".

Corrected

- L284-L285: The sentence "Other influential climate modes of variability are linked to the North Pacific variability, namely the PDO and NPGO" seems a little bit out of context. Could the authors rewrite this sentence for it to be better connected to the paragraph where it is located?

We have rewritten this last sentence to make the context more clear.

- L600: In the sentence "... whereas as the minimum correlation ...", "as" should be deleted.

Corrected

- Table 2: I recommend that the authors specify the units.

Added in the caption