

REVIEW 2:

Thank you very much for the review of the paper and the comments submitted. We have answered all of them. Below you will find your comments (extracted from the PDF; in black) followed by our responses (in blue).

Dear authors,

I had the privilege of evaluating your manuscript entitled "Coastal assessment of Sentinel-6 altimetry data during the tandem phase with Jason-3." I commend you on your insightful research and would like to share my feedback and recommendations to enhance the manuscript's potential for publication.

Please, find attached my comments and suggestions in this pdf. I introduced them as comments in the current manuscript.

Best Regards,

It should be better the other way around: "the geophysical data records (or measurements) available in the standard products"

This has been changed in the text.

when I started reading this list of "quality parameters" it gave me a negative feeling, I suggest to change them to give something a bit more optimistic in a similar way you did in lines 56-58

Done as suggested.

This two paragraphs are mixing the capabilities of transmitting continuous pulses with higher PRFs (Envisat RA and Jason missions with 2kHz, S6 with 9 kHz) with the ground processing that is performed to it.

In this first paragraph I would suggest to focus on the fact that in the traditional altimeters we had to rely on the on-board processing made where the waveforms were already averaged. Nowadays with CS2, S3, we are able to perform SAR processing on ground because the individual pulses are down-linked

We changed the paragraph accordingly.

In terms of processing, S3 has already SAR and LR retrievals as onground we can generate the pseudoLR waveforms from the SAR ones.

One suggestion is to include here some overview of how Sentinel-6 was born as a Jason Continuity mission (also to clarify why J3 is the predecessor of S6) with the orbit and some instrumental heritage from them (ku radar, radiometer, some positioning systems as well) but at the same time it incorporated the higher PRF that allowed the SAR processing without major issues related to Doppler ambiguities.

Done

Another point that can be good here (instead of the first suggestion or together with it) is to introduce the onboard RMC processing performed to reduce the data rate but I am not sure if it is relevant in the scope of the mission since it is not fully exploited over coastal regions.

Since RMC is not relevant for this study, we have not included it in the text.

After reading this section and the results, I miss some details about the way the coastal records has been extracted. For instance, if data from big lakes or closed seas has been used, or if data near sea ice areas has been excluded or not.

Some information on this has been included at the beginning of section 2 (data).

It is confusing to mix ionospheric correction that can be measured from the radar (dual band) with the tropospheric ones that are measured with the radiometer. With this wording is not clear if we can measure the tropospheric ones with the radar directly. I suggest to rephrase this sentence.

Text has been modified accordingly.

In this paragraph there are several acronyms that need to be detailed:

GDR-F

SAMOSA

MLE

EUM and PDAP or maybe EUM PDAP all together

Done

Not sure if this acronym needs to be further detailed or is not an acronym but the name of the retracker itself. Additionally, it should be explained why on the other sections of the document the CORAL

retracker is referred as CORALv2 as it is not clear if CORALv1 is already defined in ref14 and CORALv2 has some additional changes wrt. to v1

Done

Where is this number coming from? Include it in the text if needed.

These numbers were defined and explained in Schlembach et al (2020). We added this information to the text.

Is it clear in the results but should be worth to specifically write that the biases are computed against the J3 LR standard retrievals, since a similar tandem calibration was also performed in the past between J3 and J2

Done

From Figure 12 is not clear if the total number of tide gauges used in this study is limited to North America and Europe. By looking at Figure 1 of

<https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/gdj3.174> it seems to me that the GESLA tide gauges are extended globally.

I suggest to add here a map with the locations of the tide gauges used in this study or otherwise, explain the extension/density of the ones used.

You are right: we have not used all of the globally distributed GESLA3 stations. We can only use stations providing data in the short period of our analysis (March to June 2021). In this period, only 246 stations contain enough data (we require at least 5 values). These are located mainly in North America and Europe. Only one station used is not shown on the plot (located west of Hawaii). We now added a more detailed explanation in Section 3.4 and a note in the Figure caption.

In case the figures need to be redone or are easy to be regenerated, I suggest to order the groups from <5km to >20km or the other way around. It should be clearer when comparing the improvements when going from farthest to closest to the coast.

This comment also applies to Figure 2, 5, 7.

Figure 12, is ok from this point.

Figure 1,2 and 5,7 have been updated according to this suggestion.

This plot is very difficult to interpret with the current Y axis scale.

Would it be better to zoom in from 0 to 0.2 meters or something where we can see the differences between the retrackers?

You already commented about the errors in the high SWH areas for <20km (in lines 229-231) so I don't think there is any relevance on showing these bad performances.

Figure 4 has been adapted and the y axis is now limited to 0.3m. This has been included in the text (line 257 with track changes)

From the explanation of Figure 5 is not clear if the figure is limited considering the same limits as Figure 4, figure 3 or the overall 0.25m - 25 m detailed in line 129.

I suggest updating the label of this a) plot with the one that is correct from these options:

a) SLA: $0.25 < \text{SWH} < 25$ m (aligned with line 129)

a) SLA: $0.25 < \text{SWH} < 15$ m (as in Figure 3)

a) SLA: $0.25 < \text{SWH} < 10$ m (as in Figure 4)

Same comment is also applicable to Figure 7

No additional SWH limitations have been applied for this analysis. Thus, the values include SWH up to 25m. This information is now provided in the Figure caption (Fig. 5 and 7).

Following the previous comment, use 0.25 here

Same comment is also applicable to Figure 7

Clarified in the caption (see above)

Following the previous comment, update it to the correct limit used: 25, 15 or 10 m.

Same comment is also applicable to Figure 7

Clarified in the caption (see above)

By looking at Figure 10 top plot it seems clear that there pattern is very uniform in time.

I won't make such an statement if the reason of this periodic signal is not clear.

This is only related to the trend (and not to the periodic signal). We agree that the formation is misleading. It has been changed in the text.

This section is quite important in order to evaluate the performances of each retracker against validation data.

By looking at Figure 12a, it is not clear to see the values of each individual performance.

Please include this results (Figure 12a) in a table format to make the quantitative comparison easier for the reader.

Table has been added.