

Response to Reviewer 3 Comments

Point a: Consistent name of “Sentinel-3”

Response a: Corrected throughout the text

Point b: Missing a “.”

Response b: Corrected throughout the text

Point.c)

c)line 58: I would think that “measurement” would be more appropriate than “measure” since we are addressing the action of measuring.

Response c: : Corrected

Point d “Low cost”... agree with such statement. The implementation of a spaceborne system is quite expensive on the contrary. Now, the European Copernicus program provides the data freely, which gives this impression of low cost. Thus, I would instead mention the European Copernicus program which distributes freely the data to users. In addition, there is a commitment to provide these data over a very long period for monitoring the climate change, which is allowing to perform such analysis and still do it in the future

Response d: : Corrected (line 69-72)

Point e: anthropic to anthropogenic...

Response e: : Corrected (line 74)

Point g: SAR instead of Sar.....

Response g: : Corrected (line 82)

Point h: line 98: there is a dam on this lake: how do we know that the water level fluctuations in this lake are not due to the human management of the dam? Maybe a few lines would be great to explain why we are confident that the observed water level fluctuations are linked to natural processes and not influenced mainly by the dam management.

Response h:

Water level variations in the dam and the entire lake are controlled by the two main tributaries of the Sassandra watershed and rainfall. However, the dam is located towards the deep zone of the lake (Figure 2, see also line 356-371)

Point i: i) usually in radar instead of “bidirectional” we are prefer using “round trip”

Respond i : Corrected (line 168)

Point j : this paragraph is a bit confusing. Indeed all the level-2 GDR products provided by CTOH are including all the different geophysical corrections. I would only mention this. Indeed, I am not sure maybe it can be checked that CTOH is using the GDP plus product for correcting the wet tropospheric delay. As stated I would only mention that the CTOH are delivering the level-2 GDR

Respond j : True... Corrected, see line 185-188

Point k: line 246....“calibrating” the data ?....

Respond k: this is an error....Corrected (line 215)

Point l: Line 259.....“in-situ and not observed”

Respond l: True.... Corrected (line 227)

Point m: ...“R2 instead R2....

Respond m: Corrected throughout the text

Point n: line 278: the hypothesis that the in-situ is closer to track 16 explaining a better agreement is difficult to understand. Indeed on figure 6, at the beginning we get a very good agreement on both sets and then surprisingly track 743 becomes anti-phase. An explanation shall be found on this to understand what occurred starting from 2016. What I would do is the following. As we can see on Figure 4, track 743 is going through a major piece of land (not so clear for track 16 since it seems to be at the border). Maybe the land in this area has been modified so I would select only the part of track measurements which are really inside the lake away from the banks/land. I would probably do the same for track 16 since the land configuration might also evolve at some point. Hopefully with this reduced data set, we should be in good agreement between tracks 16 and 743. I really do not think that the track separation could be the explanation for figure 6.

Respond n: There were errors in the process of selection and treatment of valid points in the virtual stations, so the process has been revised and therefore this Assumption has been removed from the text

Point o:"under the figure some times appear 314, 333, ..."

Respond o: Errors....Corrected throughout the text

Point p: Figure 7: not sure what is the added value of this figure since the same information is contained in figure 6.

Respond p: That's right, we added a more relevant figure (Figure 7, line 380 and line 356-371 for comment)

Point q: line 338: I would write started on June 02, 2016 a few months after the launch of Sentinel-3A

Respond q: True....Corrected (line 323-324)

Point r: line 358: on line 87 it was stated that the long rainy period was from March to July so we should be consistent

Respond r: Corrected

Point s: Figure 8: we should be consistent with the absciss axis and in principle the year should be indicated (2016, 2018, 2020 and 2021)

Respond s: Corrected (Figure 6, line 372)

Point t: Figure 9: please use consistent absciss axis with respect to figure 9

Respond t: This figure has been removed

Point u: line 398: have you checked S3A

Respond u: This is our observation for the moment... But to avoid any polemics we have removed this part in the text

Point v: lines 418 to 420: I do not agree with the statement here. Cryosat and Sentinel-3 are both using the Delay Doppler processing technique. However, Sentinel-3 has 2 major advantages over Cryosat-2. First, the satellite resource (memories, etc.) has been sized so that data can be acquired/recorded all along the orbit. In addition, Sentinel-3 has a tracking mode (called open loop mode), which is essential for capturing consistently data over hydrological targets.

Respond v: True... Corrected (line 399-402)

Point w: lines 426 to 439, this point was already presented earlier in the presentation and any mention with geo-physical correction is not fully interesting since level-2 GDR products are provided and used for this analysis.

Respond w: This section has been revised (line 427-429)

Point x: line 452..... A has 385 ground tracks compared to Cryosat-2 which has well over 5000 ground tracks. What plays a role here is the ground track phasing. Luckily the ground track phasing (which were selected to ensure the acquisition of signals over a radar transponder on an island in Crete Gavdos-) is crossing the lac Buyo.

Respond x: This section has been removed

Point y: line 482 I would avoid mentioning BRAT, GPD+ but instead mention the provision of level-2 GDR data freely available.

Respond y : see respond w