I'm satisfied with the answers to my questions and improvements to the manuscript. I have a few comments and suggestions to the new parts of the manuscript, and a few very minor things that I didn't catch in my first review.

Thank you for these additional comments and please see below the point-by-point responses.

Line 13: "bending angles statistics" should perhaps be "bending angle statistics".

Corrected.

Line 14: I think the sentence would be better if "and" is replaced by "but".

Agreed, it's indeed better.

Line 15: impact-height -> impact height.

We keep it hyphenated since it's a compound adjective.

Fig. 3 caption: "CODE 05 s (5 min orbits and 5 s clocks).". Should it be 15 min (it says so in the text, line 137)

Yes, thanks for catching this one. It's now corrected.

Line 151: There is a "the" too much in "by the all the members".

Removed.

Fig. 7: "Bias/standard deviation" in the x-lables, but it is only standard deviation here.

Corrected.

Equation after line 215: Although it is the only equation in the paper, it should still have a number (1). Perhaps say that P_cr is in terms of meters (as opposed to P_NCO).

Added the number and the units.

Line 218: direct handle -> view. I don't understand 'handle' in this context.

Reworded.

Line 219-220: bias -> error. Bias is a statistical measure when averaging many observations, which is not what you show here (in Fig. 10).

For the transmitter/receiver clock solutions, we refer to a bias, since they indicate a (time-varying) offset with respect to the GPS time. However, to address your comment we now explicitly write "bias error".

Line 223: Some things are worth noting in the figure -> We note the following

Reworded.

Line 228: Being the bending angle proportional -> Since the bending angle is proportional

Reworded.

Line 249: (11) -> (Fig. 11)

Corrected.

I suggest moving the new discussion in section 6 about the Allan deviation to the discussion section (section 5).

Done.

Discussion section: Why not consider the use of 5s clocks for GPS in the future? It seems that 5s is good for all GPS blocks and also gives the smallest standard deviation in the overall results in Fig. 6. I think the results in Fig. 6 is in accordance with results of refractivity statistics in the ROM SAF report here: https://rom-saf.eumetsat.int/product_documents/romsaf_vr_atm_ntc.pdf, where it appears that the 5s GPS clock results are slightly better than those using 30s clocks at high altitudes (Fig. 3.17 in the report). However, both are worse than the 1s GLONASS clocks, perhaps due to the vertical correlations that increase standard deviation in refractivity.

Thank you, that's a good point and we added this remark in the abstract and conclusion section. Thank you also for the pointing us at the SAF report, which we now quote in the conclusion section.

Summary

The authors provided a revised version of the manuscript addressing the comments from the previous review. One major improvement is the inclusion of an analysis investigating the effects of different GNSS clock rates at single-occultation level. Additionally, Section 3.1, which covers precise orbit determination of the Sentinel-6A (S6A) satellite, was strengthened with a comprehensive comparison of different orbit solutions presented in Figure 4. To provide a better overview in support of the reader, the authors added a table summarizing the different sets of GNSS products used in the study.

Furthermore, the final combined Discussion and Conclusions section was separated and expanded, now also including considerations on the Galileo and BeiDou GNSS systems.

Thank you for your additional feedback, and please see below for point-by-point responses.

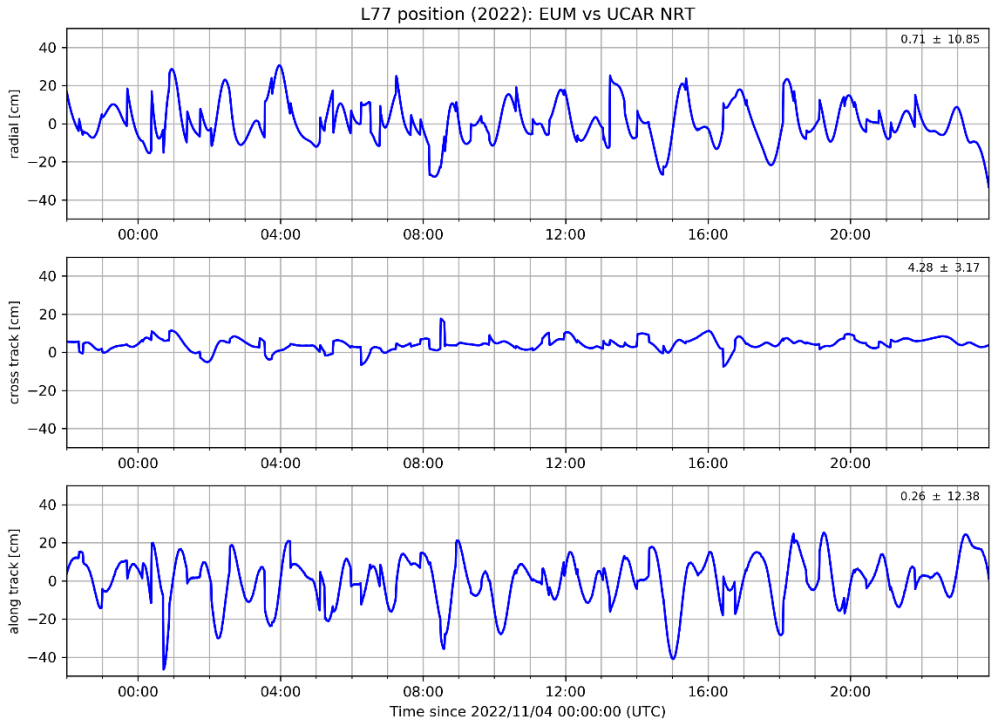
General comments

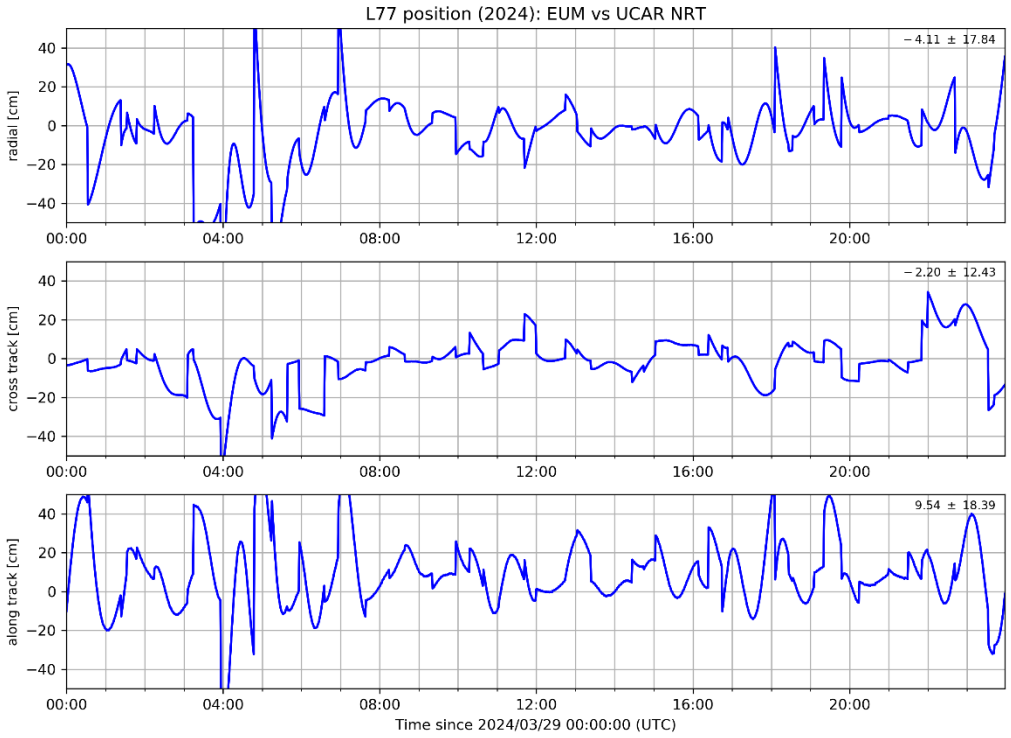
In response to feedback from the initial review, the authors included an additional figure and corresponding discussion regarding the expected performance of Galileo and BeiDou occultations in the Conclusions section. While the addition of this content and the insights on these GNSS systems is valuable and enriches the publication, the introduction of a new figure and content in this final manuscript section is not common practise. It is required that the authors restructure the last two sections of the manuscript and move their main considerations on Galileo and BeiDou, along with Figure 12, to the Discussion section. Since the final Conclusions section is generally intended to be self-contained, it is further recommended to minimize figure references unless they are considered essential.

We restructured the Discussion and Conclusions section, as suggested. We reduced the number of Figure references, while maintaining some that provide a handy connection between the statements and the results.

The paper primarily focuses on S6A and utilizes only a small batch of COSMIC-2 data. Section 4.2 points out a larger standard deviation in the bending angle statistics for COSMIC-2 compared to S6A, attributed to a POD solution of lower quality. It is argued that this is caused by the absence of a satellite macro-model, the lower orbit altitude, and increased solar activity in 2023. While Section 3.1 extensively discusses S6A POD, there is a lack of discussion on COSMIC-2 POD in this dedicated POD section. It is advised that the authors add a short discussion of COSMIC-2 POD, including relevant numbers or references, in order to provide a complete analysis and to support their assessment of lower COSMIC-2 POD quality in Section 4.2.

We did not expand on the C2 POD for two reasons. First, the focus here is S6A, which provide the bulk of the data. C2 is used to verify that the effect of the different GNSS clock rate is the same. With this, one can safely argue that using a higher rate clock product is beneficial, even though in absolute numbers the standard deviation for the two missions is different. Second, while for S6A there are several POD solutions that can be used as comparison (which we included in Figure 4, thanks to your previous round of comments), for C2 we are only aware of the NRT solutions available on the UCAR server. Here's a couple of examples comparing our POD solutions to UCAR's NRT orbits for the satellite with SP3 ID L77 (C2E2), for 2022 and 2024 (i.e., before and after the 2023 period analysed in the paper):





The comparison is quite noisy, and sometimes biased, but with a zero bias within the 1-sigma value reported in each panel (with the exception of the cross-track component in 2022. However, cross track orbital biases have the least impact on the BA bias). Of course one cannot know which of the two solutions is better, or if they are both not very representative of the truth,

but this kind of comparison would explain the somewhat larger biases of C2 at large impact heights with respect to S6A and the increased standard deviation.

We are of course interested in improving the POD of Cosmic2, and we plan to work on that in the future.

Line per line and figure specific comments:

Figures (general): Please use intermediate minor tick-marks and provide major tick-marks with shorter intervals to support the reader with the identification of relevant values in the figures (applies basically to all bending angle statistics figures).

We increased the grid spacing for the C2 GLONASS figure, since there the range of the x axis was larger and indeed the bias curve was difficult to read. We prefer to keep the style of the other figures as is, since adding marks would clutter them.

--- Abstract

L2: In the first review I noted the following: *"Space-based RO experiments …". For my understanding this sounds a bit too "experimental", RO is a proven and well advanced remote-sensing measurement technique, but maybe this is commonly recognized designation*.

We just had in mind RO experiments on other planets, where the receiver sits on ground and not on a LEO. But indeed in the context of this special issue, there's no need to specify it.

What I was referring to in my comment above was not "space-based" but the wording "experiments". I suggest to replace it by "measurements". Note that this applies to other occurrences in the text as well.

We substituted "experiment/s" with "measurement/s" or "instrument/s" where appropriate.

--- 1 Introduction

L20: Remove "an" in "requires an accurate knowledge …".

Done.

L33: The wording "some information" gives the impression that Table 1 is somehow incomplete. I suggest to rephrase.

Reworded.

--- 2 Motivation

L59: Please introduce OPE at its first usage in the text, independently from Figure 1. In Figure 1 be consistent with the introduction of OPE and STC.

Done.

L65: Start new paragraph with: "The comparison of the statistics …".

Done.

L68: Note the mission: "…, using recent S6A data …".

Done.

L70: You state that different POD SW and different GNSS auxiliary data are responsible for a 3 % difference in total number of BA profiles obtained by the OPE and STC processors. The OPE uses GNSS products from JPL-EUM (GPS: 15 min/30 s; GLONASS: 15 min/1 s) and the STC GNSS products from COR (GPS: 15 min/30 s; GLONASS: 15 min/30 s). I wonder how the different POD SW and GNSS auxiliary data (used by JPL and CODE) affect the number of processed BA. I assume both analysis center deliver GNSS orbit and clock data products covering the entire test period and that for each retrieved profile a matching modeled profile exists. Is it rather the different quality of the provided orbit and clock data which differs and therefore leads to rejection or failure to process some of the occultations? Or are there differences between the OPE and STC processors leading to different numbers of successfully processed BA profiles?

Differences in the number of products between is a combination of several factors:

- The different POD SW affects the orbit and the receiver clock solution. Typically, differences in the orbits do not affect the number of resulting products. However, since the receiver clock solution is based on epoch-wise solutions, different POD SW often results in small differences in the data cleaning procedure/results, which in turn may results in small differences in the number of computed receiver clock epochs, and thus in number of occultations. These differences may affect both the degraded-to-nominal ratio and the total number of products;
- We typically see a very good quality of the GNSS products produced by CODE and JPL. Thus, they are comparable and any difference does not influence the number of occultations. What can and has happened is that one centre decides to not provide the solution for a particular space vehicle (e.g., because it's in commissioning or declared unavailable), while another does (because it is still processed and the solution passes the QC), in which case if the receiver is recording the signal from this particular satellite, the associated occultations cannot be processed given the missing relevant GNSS orbit);
- S6A sometimes sends down archive dumps, i.e., data that was not sent down in a timely manner and thus, may fill gaps that were initially present in the level 0 data. In OPE, we have plenty of time to receive the archive dumps, while in the STC processor we can miss some of them.

Now the text also includes the third possibility.

L72: Please stick with OPE here instead with NTC. It is easier to relate to the following text and occurrences of OPE therein.

Done.

L76: Start new paragraph with: "Previous work has pointed out …".

Done.

L79: Plural and hyphenation: "Less stable clocks would require a higher-rate correction to compensate their noise, …".

Done.

---- 3 Set-up of the experiments

L109: At the beginning of Section 3.1 you state that LEO orbit and clock solutions are obtained with Bernese 5.4, with the exemption that the OPE embedded Bernese 5.2 in 2021 and thus also

has been used with the OPE processor in Fig. 1 (L109). To clarify, apart from the OPE analysis in Fig. 1, which used Bernese 5.2, in all other cases Bernese 5.4 was used?

We clarified that Fig.1 is the only place where Bernese v5.2 has been used.

L106: Better: “Integer-ambiguity fixing has been shown to perform better …”.

Done.

L120: “etc.” instead of “ect.”

Fixed.

L120: Please correct: “As a result, the reduced-dynamic versus kinematic orbit comparison …”.

Done.

L124: Introduce hyphenation for “cross-check”. Also for all further occurrences (e.g., L128).

Done.

L150: Sentence structure: “In Fig. 4, we use the CPOD QWG combined solution as the reference solution… ”.

Done.

L153: Add missing space between value and unit: “JPL 30 s GNSS products”.

Added.

--- 4 Results

L165: Plural: “GNSS clock data rates”. Maybe even better to rephrase: “… using GNSS clock products with different data rates in the BA data processing”.

Secondo option adopted.

L172: Remind the reader once more of the selected data rates and specify the five data sets used.

Done.

L197: Do the three-days of COSMIC-2 test data comprise data from all flight models and have they been processed from level 0 data from UCAR? Please add this information, in particular the origin of the data, to the manuscript.

Thanks, we added this information.

L199: Sentence structure: “For GPS occultations we only present results for GPS clocks at 30 seconds (Fig. 9), …”.

Done.

--- 5 Discussion

L206: Better: “… points to the importance …”.

Thanks, corrected.

L207: Please correct to “… in terms of …”.

Done.

L212: Use numerals rather than spelling out numbers (e.g., about 110k occultations).

Done.

L234: Plural: “these data”.

Done.

L237: Plural: “… set of bending angle profiles.”

Done.

L238: I think you intend to refer to Fig. 7 here. Also, I would rather say that there is no obvious trend in the standard deviation across the GPS blocks with respect to different clock rates.

Thanks, fixed the figure reference and reworded.

Figure 10: I suggest the following adaptations to the figure caption: Move second part of the first sentence to the beginning of the sentence to improve the word order; Move the note on the different vertical axis ranges in brackets to a separate sentence. Furthermore, in my opinion the interpretation rather belongs in the text than in the figure caption. In any case you should elaborate which decrease is very evident for GLONASS and rather talk about phase variations or differences instead of lines for GPS.

Reworded and removed some text since already present in the main text.

--- 6 Conclusions

Please see the general comments section for remarks on the content and structure of the Conclusions section. Besides that, line per line comments follow.

L241: Remind the reader once more what was the main focus of the study: “This work focused on the implications of different GPS and GLONASS clock rates on occultations recorded by …”.

Reworded.

L243: Word order: “… S6B, will start collecting Galileo signals on the RO antennas, in addition to GPS and GLONASS signals.”

Done.

L245: Plural: “… modern RO missions also exploit … ”.

Done.

L248: Standard deviation of what? Elaborate and provide more context.

Expanded.

L249: “vertical error correlation (Fig. 11)”

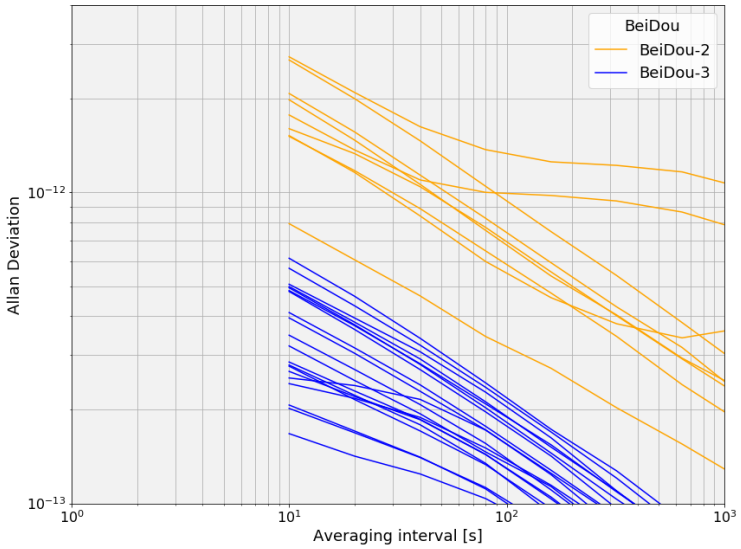
Done.

L253: Add figure number and adequate commas.

Done.

L256: So there are no BeiDou clock products available with a rate higher than 30 seconds? Especially the shorter averaging intervals of the AD would be of interest.

There are indeed some GNSS NTRIP streams providing BeiDou clocks at 5s. In our experience these products are not very stable, and they often are of worse quality with respect to the MGX products (even accounting for the RT timeliness). Here below is an example of the Allan Deviation for such a product, for 2024, Oct. 30th. We consider the MGX product more informative that the NTRIP example, even though it has a lower rate.



L262: As you pointed out in your response to the initial review I also consider “sweet-spot” an informal definition because it varies among different studies. I recommend not overemphasizing it: for example, you may consider stating "...is expected in the 5 to 30 km range (Kursinski et al., 1997), also referred to as the so-called 'RO sweet-spot'.", and avoid the repetition of the term in the following sentence.

Done.

L264: Remove comma before “Recently ...”.

Done.

--- References

L298: Remove space from article number: “112395”.
That was the page number and the space is introduced as part of the bibliography style (Copernicus). The page number has been removed, since it is also part of the DOI.