The paper still needs a few major corrections:
1. Lines 25-26: the wording of „each technique" and „three techniques" is not clear
Thank you. We revised the sentence.
2. Line 80: 'the reported uncertianty of the measurement'. I guess you are not reporting the uncertinaty of GPS measurements, but the uncertainty of the resulting displacements…?
You are right. We revised the sentence.
3. Line 115: The trajectory model has evolved over the years. The one you've mentioned here is the simplest trajectory model, which has been upgraded to an extended model best suited to displacement series.

The trajectory model has evolved with time. From linear only fit, to linear fit with jumps, to the most widely used fit (offset, rate, seasonal). Some more modern models such as the extended linear trajectory can also handle postseismic deformation.
Our data pre-processing handles the cases that could potentially need the model with postseismic transient (see Paragraph 2). For example, we delete data that may be biased by a postseismic transient, so no post-seismic fit is needed. Therefore, we prefer using the standard conventional trajectory model (see e.g., Klos et al., 2023).

4. Did the authors quantified the impact of draconitic period and thermal expansion of bedrock/monument on their annual signal they are comparing? This may be of large importance when comparing the correlation vs annual amplitude.

Draconitics:

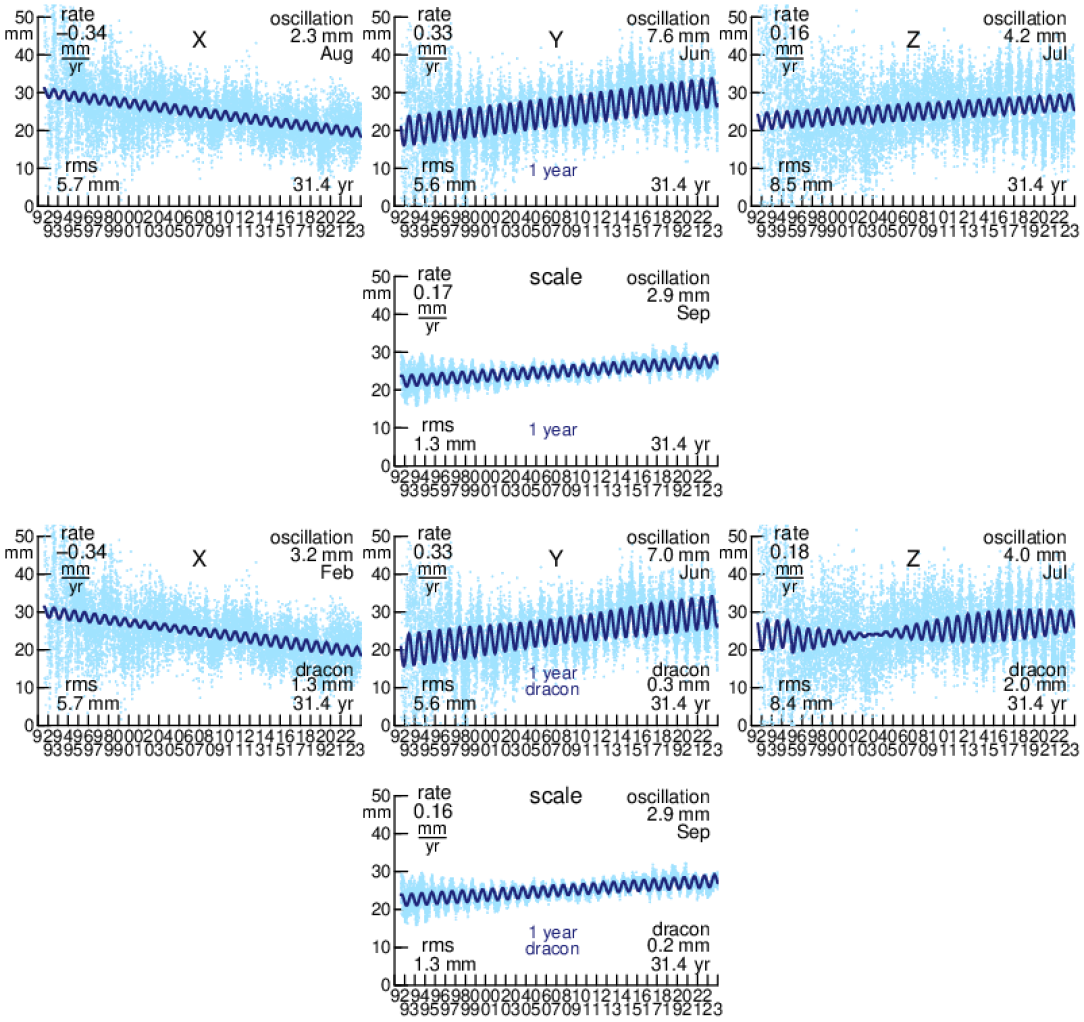
Literature: Argument for there being a significant draconitic in GPS data biasing the interpretation of position-time series is underwhelming.

- As the reviewer suggests, the first draconitic (351.6 days) is very close to annual cycle (365.25 days). To resolve for the differences between the two a minimum of 15 years of data is required (Klos et al., 2023). Our timeseries do not exceed 15 years, thus we do not add the draconitic period to the determinist model.
- Several tens of refereed articles on GPS measurements of seasonal oscillations without there being mention of a draconitic [e.g. White et al. 2022]. We rely on the satellite orbit determination of Bertiger et al. 2002 and the site position determination in Blewitt et al. 2018; we do not want to alter these documented results.
- In the GPS contribution to ITRF 2022 [Altamimi et al. 2023], Rebischung 2022 estimated and removed periodic signals at the first 8 GPS dracontic harmonics [https://itrf.ign.fr/en/solutions/ITRF2020]. However, there are no specifics on how big the amplitude of the draconitics are (https://itrf.ign.fr/docs/solutions/itrf2020/IGS-contribution-to-ITRF2020.pdf). Ray et al. 2008 is the seminal study on the GPS dracontic. But Amiri-Simkooei et al. 2017 find the draconitic in the 3rd GPS reprocessing to have decreased and to be minor.

To further assess, we fit an offset, a rate, a sinusoid with a period of 1 year, and a sinusoid with a (first dractonitic) period of 351.6 days to JPL's X files (the file contains transformation parameters and position and velocity residuals relative to ITRF2014), the values X, Y, Z, and Earth's scale applied to all positions. Overall, daily X files between 1992-2023 are used for the analysis.
For all 4 quantities, we find the amplitude of the first draconitic to be no more than 1-2 mm.

We appreciate the reviewer's feedback. We will keep in mind and evaluate further as we prepare a next manuscript where longer GPS timeseries will be available; right now, we want to keep with the GPS position-time series of Blewitt et al. 2018 (2006-present).

In the figure below:
light blue shows daily X,Y,Z and scale parameters with respect to ITRF2014.
Top 4 panels: A bias, rate and sinusoid fit is shown in dark blue. The rate and the amplitude of the peak-to-peak oscillation are reported.
Bottom 4 panels: A bias, rate, sinusoid and draconitic (351.6) fit is shown in dark blue. The time-series is long enough and allows for deciphering between annual cycles and draconitics. The amplitude of draconitic using 30+ years of data ranges between 1-2 mm (X and Z axis respectively).



We added the following short explanation in the manuscript:
In a future release of the dataset, we will evaluate the presence of draconitic periods in the time-series and will add them in the trajectory mode if justified. With the timespan of the current time-series being up to 15 years, we cannot resolve for the draconitics (i.e., the first draconitic period (351.6 days) and the annual cycle (365.25 days) are very close and require a long time-series to be deciphered). For a more thorough discussion we refer the interested reader to Amiri-Simkooei et al. (2017) and Klos et al. (2023).

Thermal expansion: Thermal expansion can show up in annual cycle. Typical values of thermal expansion suffice to rule out annual vertical signals driven heating and cooling of the bedrock (Tsai, 2011). For example, an 8×10^{-6} °C^{-1} linear coefficient of thermal expansion times 2 m depth times a 30 °C seasonal temperature variation delivers an estimate of motion of just 0.5 mm (Argus and Peltier, 2014). Klos (2023) finds that amplitude of thermal expansion is anywhere between 20-40 times smaller than annual cycle, deeming it negligible.

5. Lines 100-111: ‘Common model error’? Is that correct? It should be ‘common mode error’ / ‘common mode noise’.

Thank you. We substituted 'common mode error' for 'common model error' everywhere in the manuscript.

6. Lines 112-116: This paragraph probably should have been earlier, as it now interweaves the CMC description, making it inconsistent.

Please check again the manuscript. The lines you refer to do not match up. If you refer to lines 105-109 the flow is: 1) Definition of common mode error; 2) what Kreemer and Blewitt did about common mode error; and 3) what Tian and Shen did about common mode error.

7. 'Timeseries' vs 'time-series' vs 'time series'. Please be consistent throughout the manuscript.

Thank you. We use the term 'timeseries' throughout the manuscript.

8. 'GPS up displacements' vs' GPS vertical displacements'. Please be consistent throughout the manuscript.

Thank you. Fixed. The term vertical displacement is used throughout the manuscript.

9. 'data set' vs 'dataset'. Please be consistent throughout the manuscript.

Thank you. Fixed.

10. Lines 200-202: Is there any difference between terms 'position time series' and 'displacement time series' you use? If yes, please, explain. If not, please stay consistent.

Thank you for your comment. We revised our description earlier in the text to clarify.

"We input the NGL position timeseries, derive the displacement relative to a reference epoch and then follow Argus et al. (2010, 2017, 2021) to isolate the part of GPS displacements reflecting solid Earth's elastic response"

11. All station names are usually written in capital letters. Please correct in the text and drawings.

Done.

12. Line 302: I would suggest using GPS observed vertical displacement or GPS vertical displacement for short.

Thank you! We revised accordingly.

13. Line 340: no k and h in the explanation.

You probably mean line 240. We revised and explain the terms. Thanks!

14. To what degree and order did the authors determine the spherical harmonics from the mascons?

We use 3-degree mascons, which spherical harmonic expansion is up to degree and order 360.

15. Figure 2: Are correlation values plotted for the residuals of equation (2)? If so, why is a dependency between annual amplitude and correlation observed? Is there any residual annual signal in the displacement residuals?

No, for the correlation the original timeseries was used. Please see lines 278-279 "First, we specify the level of agreement between the datasets by estimating the Pearson correlation coefficient between GPS and GRACE(-FO) timeseries." Therefore, the dependency is anticipated.

16. Figure 3: is the variance estimated for the annual signal?

The variance is estimated from the fit of the GPS and GRACE-(FO) timeseries of an offset, a rate, and a sinusoid with a period of 1 year.

17. Description of Fig. 5, something is missing in the second sentence.

Thank you! r_{MAD} was missing and was added.

18. Fig. 6: Are these the amplitudes of noises, or…?

Yes. This is the amplitude of the noise/uncertainty. We revised accordingly.

19. Line 696: GPS-derived or GPS-observed displacements? Please, stay consistent.

Thank you. We use the term “GPS-derived” throughout the manuscript.

20. Line 754: do you mean ‘non-tidal’ atmospheric and oceanic loading models?

Thanks for picking it up. It is indeed non-tidal.