Reviewer #1

GENERAL COMMENTS

This is a very interesting manuscript that deserves publication on the potential of using ZTDs derived from raw GNSS data obtained from private citizens smartphones. Supplemented with an example of ZTD data from a smartphone providing GNSS data in an idealized setting and compared to ZTD derived from a professional grade GNSS receiver.
I congratulate the authors of having written a nice, easy to read manuscript almost ready to publish.

Thank you for recognizing the value of our manuscript!

Compared to previous tests of usage of other crowsourced smartphone data, such as for example pressure (see e.g. Hintz et al, https://doi.org/10.1002/met.1805) it is clear that for derivation of ZTD from raw GNSS smartphone data much longer un-interrupted time-series are required for the mobile phone data to be useful. On top there is a benefit from obtaining the GNSS data, when the phone in an open environment.
It would be interesting to include in the article information about:
1. The local time of day distribution of the full data volume versus the volume kept for analysis after filtering.

Thank you for the comment! The figure below shows the distribution of the local time when users started collecting GNSS data in Germany. It can be concluded that most data were collected during the daytime or in the late evening, especially for the selected data. This figure is not included in the revised manuscript since it is not closely related to the main topic. However, a sentence has been added to section "3.2 Crowdsourced smartphone GNSS data" to mention this finding:
"*Most of the data were collected during the daytime or in the late evening.*"

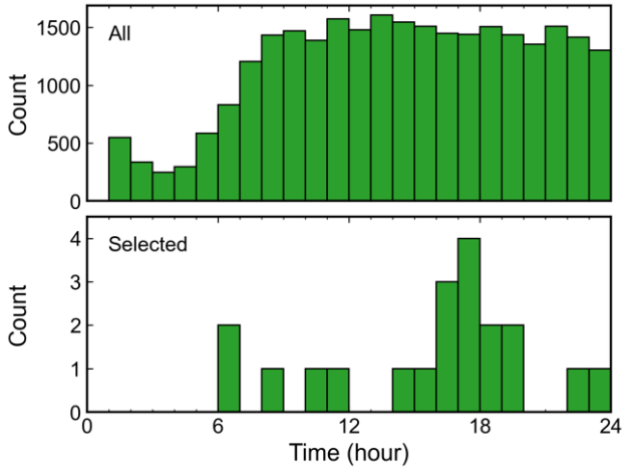

Figure 1 Distribution of local time when users started collecting data in Germany. The upper panel shows the distribution of all the crowdsourced data and the lower panel shows the results of the 20 selected data sets.

2. Were the volunteers providing the data given any information about how to use (e.g., how long in the proper mode) or place (indoor/outdoor/sky view) or not move their devices prior to the experiment?

Yes, some basic instructions on how to collect GNSS data were given when users opened the CAMALIOT app for the first time. For example, users were told to leave their smartphones stationary in a place with an open-sky view. However, these requirements could not be enforced.

We added one sentence in section "2.1 Data selection" to include this information:
"*For example, users were advised to place their smartphones in a stationary position with an open-sky view.*"

3. Many Android phones contain also a pressure sensor, data from that could be collected simultanously, the two types of data potentially improving usage when used together (just your thoughts on this).

Thanks for the comment! Yes, it could be beneficial to collect air pressure measurements along with raw GNSS data. For example, (1) precise locations could be derived from GNSS for barometric measurements and further correct barometric measurements with altitude information, (2) the zenith wet delays can be precisely separated from GNSS-derived zenith total delays if air pressure and temperature are available.

Actually, this functionality has been implemented in the latest version of the CAMALIOT app. Users can now choose to collect and upload measurements from environmental sensors, such as air pressure and illumination, along with GNSS observations. Hence, we have added a sentence in the outlook part of section "5 Conclusions":
"*The latest version of the CAMALIOT app allows users to record environmental sensor measurements, such as air pressure, which could further contribute to meteorological applications.*"

SPECIFIC COMMENTS

The smartphone based curves in figure 11 appear to me surprisingly smooth. Is that due to constraints in the data processing of the raw GNSS data or subsequent smoothing of the ZTDs?

Yes, a between-epoch constraint (i.e., process noise) was applied to the ZTD estimation, which is specified in Table 1 in the manuscript. No subsequent smoothing was applied.