

## ***Interactive comment on “Reduction of ZTD outliers through improved GNSS data processing and screening strategies” by Katarzyna Stepniak et al.***

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First, we would like to thank Anonymous Referee #2 for all the comments which helped us to improve the manuscript. Please find below detailed clarifications and responses to your comments.

(1) It would be useful to discuss why the authors are trying to improving the double-difference processing rather than just using PPP in the introduction, just more elaboration on what has been discussed in the “Conclusions” section.

Answer: We would like to include the following paragraph in the introduction (line 3,

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page 2):

“Another approach of satellite data processing which can be used to estimate GPS ZTD is the precise point positioning (PPP) technique. Since PPP allows to process each station individually, there is no direct propagation of errors between stations. However, the accuracy of ZTD estimates from PPP processing depends strongly on the quality of satellite orbits and clocks. In our study, we focused on improving the double-difference processing because most EPN and E-GVAP analysis centres rely on a network approach utilizing double-difference observations, and many of them use Bernese GNSS Software v.5.2 (Dach et al., 2015).”

(2) I would recommend that the authors discuss the potential application of proposed methods, such as applying them to historical data to generate a new data with less outliers or to the operational processing to improve future ZTD estimates. So the whole community can benefit.

Answer: Discussion about potential application as already provided in the conclusions (lines 28-31, page 11), nevertheless we will complete the conclusions as suggested by the referee:

“The improved processing strategy may be also an interesting approach for reprocessing historical data to generate a new data with less outliers or to the operational processing to improve future ZTD estimates. More accurate and stable ZTD series may be produced in this mode, and the impact of equipment changes may be more easily detected in the double difference residuals than in zero difference residuals.”

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