

## **Author’s response on “High-resolution topography of the Antarctic Peninsula combining TanDEM-X DEM and REMA mosaic”**

*Authors:* Yuting Dong, Ji Zhao, Dana Floricioiu, Lukas Krieger, Thomas Fritz, Michael Eineder

The Cryosphere Discuss., <https://tc.copernicus.org/preprints/tc-2020-323/>

Referee comments are shown in *black*, our response in *blue*, changes in *red*. Line numbers refer to the newly submitted revised manuscript (pdf).

### **Authors’ response to Dr. Kenny Matsuoka**

#### **General comments:**

*I am also happy to see substantial improvements in the manuscript. One reviewer pointed out that Section 5.4 can be shortened, which is a valid point in my opinion. It is not necessary to merge it with Section 3, but please consider a more concise presentation of Section 5.4.*

**Response:** We thank the editor Dr. Kenny Matsuoka very much for the positive feedback and the very helpful comments. We carefully evaluated all comments and suggestions and point-to-point responses are given in the following. Corresponding improvements were added in the revised manuscript and are marked in *red*. In the revised manuscript, section 5.4 has been shortened and the redundant description with the introduction or section 3 has been removed.

**Changes:** Section 5.4 has been shortened and its subtitle has been changed into “Potential applications of the corrected TDM DEM”.

*This paper describes the methods to generate a new DEM, so the release of the associated DEM is critically important. Because the review process is very close to complete, please upload the dataset to obtain DOI, and include DOI to this article. A part of the meta data can be described in data availability section (see my comment below for Table S4).*

**Response & Changes:** Thanks for the advice. The brief description of the meta data has been moved to the data availability and Table S4 has been deleted. Besides, there will be a text file accompanying the data product to describe the meanings of values in the flag file.

As for the DOI of the data, we give a formal website in the data availability as (<https://geoservice.dlr.de/web/>). Later the data will be released there. However we have to say this will take some more time because of the DLR’s legal data policy. Anyhow we are working very hard toward it now and the DEM data will be available soon.

*Below, please find other minor comments:*

*Figure 1: add distance scale to the two zoom-up insets. Cite a reference for RAMP and*

*Matsuoka et al. (2021) for Quantarctica (<https://doi.org/10.1016/j.envsoft.2021.105015>); the former is a requirement to use Quantarctica, and the latter is the latest recommendation from the Quantarctica project.*

**Response & Changes:** Figure 1 has been improved with distance scales to the two zoom-up insets added. The relevant references have been cited.

*P8L197ff: this paragraph presents the minimum elevation inconsistency, minimum elevation discrepancy and minimum elevation difference. These terms need to be better defined and readability of this paragraph needs to be improved.*

**Response:** All the three terms have been unified as “minimum elevation difference”. Clarification about this term has been added. The wording of this paragraph has been improved.

**Changes:** Changes can be found in Point (4) of Section 3.1 in red.

*P13L262: Is the citation of Figure 1 correct?*

**Response & Changes:** Sorry for the mistake. Citation of Figure 1 has been changed into Figure 2 as in P12 Line 265.

*P14L294: briefly describe the magnitude of the temporal corrections based on Smith et al. (2020). For example, add mean and quantile values.*

**Response:** Thanks for your comments. We have added the statistics of the temporal elevation corrections including mean, 10% and 90% quantiles.

**Changes:** Changes can be found in second paragraph of Section 4 in red.

*Tables 2 and 3: do you need to put elevation ranges into parenthesis?*

**Response & Changes:** The parentheses in the tables have been removed.

*Figure 14 and associated text (P30L470-477): the caption needs to be expanded. Why are there so few data points in this figure? The description/interpretation of this figure is also very limited.*

**Response:** Thanks for the very helpful comments. There are respective 7 points in Figure 14 for both LVIS 2015 and ATL06 2019 altimetry data corresponding to different elevation ranges in Figure 13. The slope values are the mean slopes of each elevation range. The corresponding MAEs can be obtained from Tables 1 and 2 same as in Figure 13.

**Changes:** Caption of Figure 14 has been improved with more clarification. More description of Figure 14 has been added (Line 485 in red).

*P32L519: HEM -> DEM, typo?*

**Response & Changes:** Sorry for the incorrect expression. Since Section 5.4 has been improved, this word has been deleted.

*Table S4: this is a description of the dataset associated with this article. So, please move this information to the data availability section (or delete).*

**Response & Changes:** Table S4 has been deleted.

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### **Authors’ response to Dr. Romain Hugonnet**

#### **General comments:**

*The author have done an excellent job accounting for the referee's comments, and also relating to the closely related paper by Wessel et al. (2021) which, since the last iteration, entered discussion in TC.*

*The additional discussion points, updated calculations and tables, and material presented in the Supplementary have satisfactorily addressed all raised points.*

*I only have a comment on the revised text: I found the added section 5.4 of the Discussion a bit long, and redundant with several aspects discussed either the end of the Introduction or in section 3.*

*I suggest shortening the related section, or possibly embedding it totally in section 3.*

*Other than that, I see no additional change necessary for the publication of this manuscript.*

**Response:** We thank Dr. Romain Hugonnet very much for the positive response. We carefully considered your advice to re-organize the redundant section 5.4 which is also the comments from the editor. In the revised manuscript, section 5.4 has been shortened and the redundant description with the introduction or section 3 has been removed. The improved content is in *red*.

**Changes:** Section 5.4 has been shortened and its subtitle has been changed into “Potential applications of the corrected TDM DEM”.