

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on **essd-2021-255**

Anonymous Referee #2

Referee comment on "A High-Resolution Antarctic Grounding Zone Product from ICESat-2 Laser Altimetry" by Tian Li et al., Earth Syst. Sci. Data Discuss.,
<https://doi.org/10.5194/essd-2021-255-RC2>, 2021

This manuscript presents a high-resolution antarctic grounding zone product from ICESat-2 laser altimetry. The data presented in this manuscript is critical for assessing ice sheet stability, estimating mass budget and its contribution to future sea level rise of Antarctic ice sheet, and ice sheet model projections. This study could potentially make a valuable contribution to studying Antarctic ice sheet mass balance. However, I do not believe the presentation of the manuscript at this stage is sufficiently good to warrant publication. There are some issues with the manuscript that would be valuable to address.

Major comments:

- In Sect. 2.5, the paper describes the operation of crossover analysis, not the method of GZ features extraction. Crossover analysis is mainly to validate the results. So, Sect. 2.5 should be merged into Sect. 3.2.
- In Sect. 3.2, the paper mainly focuses on the comparison with ICESat-2 crossover measurements. However, there are many a lot of comparisons with other study, are mixed in. These comparisons are better to be move into in Sect. 3.3.

The paper is wrote well entirely. However, there are still some problems in English writing. It is suggested to revise the English description entirely.

Other comments:

- In Fig 2,3,8 and 13, lines of different colors are difficult to distinguish, please try changing their linetype, thickness, or color. The legend covers the data, please adjust the position.

- Line 161 and 219, (d.I,n) should be (d, i, n).

- In Fig 7, 9 and 10, the data source of the mass change used in the figures is not given in the manuscript. Why use mass change? Is ice velocity more appropriate here? Moreover, these diagrams do not show absolute separations very well. I suggest showing only the key areas as shown in Fig 11

- In Fig, suggest adding a subgraph representing the location.

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2021-255/essd-2021-255-RC2-supplement.pdf>