

Interactive comment on “Changing pattern of ice flow and mass balance for glaciers discharging into the Larsen A and B embayments, Antarctic Peninsula, 2011 to 2016” by Helmut Rott et al.

Anonymous Referee #2

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Review of “Changing pattern of ice flow and mass balance for glaciers discharging into the Larsen A and B embayments, Antarctic Peninsula, 2011 to 2016”, by Rott et al.

This manuscript presents a mass balance study for the East of the northern Antarctic Peninsula, based on remotely sensed altitude changes, and a comparison with mass changes derived from modeled surface mass balance and surface flow velocities. It is shown that the land-based ice is continuing to lose mass, although the rate of loss has decreased over time since the collapse of the ice shelves. The manuscript is well written and clearly structured. The different data sources are described in great detail and also the methods are clearly presented. The results for the single catchment

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areas are described and also provided as tables, which is quite useful. This is new data, continuing earlier observations to extend the overall record, and thus of great interest to the community. However, I would like to raise several points, which I think should be addressed before final publication:

1. in lines 272-276 error estimates for the glacier cross sections, the flow velocities and the modeled mass balance are given. They appear to come “out of the blue”. It would be good to describe how you got to these estimates.

2. There is a general estimation of ice density to be 900 kg/m^3 . This appears rather high to me, and means there is hardly any firn layer on the glaciers. There has to be an error assumption for this density value as well. This becomes important when you are concluding ice thickness from the floating glacier tongues, but also for the lowering of the surface of the grounded ice. Can there be a lowering of the surface due to firn compaction from surface melting? Maybe this could be discussed with the RACMO-results for the area. Is surface melting likely to occur on the glaciers?

3. The discussion is a bit disappointing in relation to the rest of the paper, and reads like an extended (repetitive) description of the results. I think one point which could be discussed more prominent in a broader context is the connection of mass loss and sea ice (fast ice) cover in the embayments. This could be an essential contribution to a better understanding of how ice shelves form, or the stability of existing ice shelves.

4. Figures 5 and 6: Maybe it would be better to place the labels of the catchment areas outside of them and connect with an error. In the form they are now they are obscuring quite a large part of the smaller catchments. The label B12 is missing, but as it's the only one maybe that's intentional.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2017-259>, 2017.

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