

Interactive comment on “Brief Communication: Ice Sheet Elevation Measurements from the Sentinel-3A / 3B Tandem Phase” by Malcolm McMillan et al.

Anonymous Referee #2

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This brief communication (BC) provides an overview of what’s gained by incorporating a tandem phase to the commissioning of new radar altimeters. As shown in the BC one could only have wished that this concept had been performed in the past during the commissioning of ERS-2, ENVISAT, and AltiKa. The BC limits the space available for more in-depth analysis of the data gathered in the tandem phase. However, after reading the manuscript I’m left with a feeling of wanting more. Here, a more classical cross-over analysis would have been obvious and a cross-over analysis of the two instruments during the tandem-phase might have given insights to the instrument degradation of S3A. However, I fully acknowledge that only the “added information” of the unique tandem phase is the scope of this BC. With this in mind, I’m only left with

C1

minor comments to the BC.

Minor comments:

I11: Add Copernicus in front of Sentinel

I12: remove “each of”

I15: “co-located measurements to be acquired” to “co-located measurements of surface elevation, to be acquired”

I19: Shepherd 2019 should be 2020.

L24: add a reference to a technical paper about the program/Sentinel-3

L37: how many cycles?

L47: Suggest removing the section and incorporate the information in the intro.

L49: Baseline 2.27? Please elaborate on this baseline numbering, how does this compare to Baseline 004, which is available at the sci-hub?

L51: Spirit, please add the geographical information

L53-55: Please use the right references for these two data set as posted on NSIDC. I know the references are limited, but the big effort of collecting airborne data should be acknowledged.

L69: “complex topo...” should do. What is non-linear?

L71-72: coherent waveforms: Is this analyzed by eye or do you have a measure?

L73: “future possibilities”: I can see how this is done for CS2 with the phase information, but how would you go about this here. Could you give some in-sights?

L79: “central part of. . .” Could you be more specific? I see the figure has coordinates, but what is the projection? The same is the case for Figures 1 and 3.

C2

L85: the number of significant digits should be the same

L94: insignificant, I guess you used the same tests as above?

L99: "recent" the first

L104: What about the satellite degradation? S3A has now been in orbit 2 years more than S3B, is this what is seen in Figure 1 with a possibly noisier S3A waveform?

L105: "indicates" - This should be stated clearly that we would need similar observations to be made when S3C and S3D are entering service.

All figures are missing information about the projection and geographical coordinates.

Figure 1: For parts of the waveforms S3A looks noisier, is there a way to judge if this is the case? Add more information to section 3 about the inter-comparison of the waveforms.

Figure 3: suggests replacing a and b with an along-flight-trace profile.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-223>, 2020.