The Cryosphere

Discussions

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Interactive comment on "CryoSat Ice Baseline-D Validation and Evolutions" *by* Marco Meloni et al.

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Major comments:

The manuscript provides a good overview of the improvements in Cryosat-2 Baseline D product over the past Baseline C. This is an important paper for anyone using the product and deserves to be published. Overall quality of the paper is good. However, in my opinion, the authors should include more of the details of the processing in the manuscript and not only link to ESA technical notes online. Furthermore, there are missing details on some of the comparisons – for example the CS2/BGEP comparison is lacking information on averaging altogether. Also, one of the subsections (3.3.5, lead detection) needs considerable work.

The Section 3.3.5. is the weakest of the manuscript and must be considerably improved before publication. I would expect to see the justification of the inclusion of stack peak-

iness and the new classification scheme would be better than the old one. However, what is now shown is that the surface type classification of Baseline C and Baseline D are identical and for that only two tracks over two MODIS images are used. What should be (at least) included here is an overall statistical analysis of surface classification results over the whole Arctic (in the style of Figure 11) to see if the two are really same. If that is the case, the authors should further discuss why the SP was used in the classification. If the two classification results are different, the authors should make a solid point why the one in Baseline D is better than the Baseline C version.

Minor comments:

Section 2 - Please include a short list (or a table) of the main variables in L1b and L2 products and what are their expected uses. Yes, they are in the product handbook, but they deserve to be mentioned in this paper as well.

L122-123 Perhaps this (reasonably short) table could be included as an annex to this paper as well?

Section 2.2. Here I would love to see a statement if there were anomalies or problems with Baseline-C that are still not fixed in Baseline-D. Maybe everything is fixed, but I'd love to know if there are pending improvements left.

L172-175 The new retracker should be described in detail. The authors should also present the rationale of choosing the retracker.

L182 "Some tuning of the thresholds for the other metrics" - please tell us what kind of tuning and on which metrics!

L189 Why not just tell us what the surface type mask model now is?

L241 typo – were compute

L250 – Where does this mask come from? Which mask is it?

L253-L259 Also the retracker has been changed, has it not? How can we distinguish

the effect of new retracker and new slope correction?

L381 I would love to see the formula here as well. As well as a detailed description how it is used in the surface classification process. Even the Design Summary document does not include the thresholds used – and they might be beneficial for anyone trying to improve the surface classification in the future.

Section 3.3.4 – In addition to WHB, there are also significant differences in the Kara and Barents seas. Would be good to mention and discuss there in the text. I would reckon this has something to do with relatively thin ice and lot of specular echoes in the area. Maybe include a zoomed version of Figure 11 difference map for these areas as well?

L400 – 413 – Which ice type (density) and snow estimates are used in Baseline D? Are they same as in Baseline C? How is data averaged (both spatially and temporally)? Are all BGEP moorings used? Averaged together? What about OIB -which OIB freeboard is used here: radar or laser? How close to each other CS2 and OIB points need to be in place and time to form a pair? Averaging?

L409-413 – The caption is confusing. What it should say is C and D are BGEP drafts compared to drafts calculated from CS-2 freeboards.

L559 – which water mask?

L564 – Why one meter? Where does this definition stem from? How would results change of more strict requirement (say 50 cm) would be used?

L575 – where did this offset originate from and which correction fixed it?

L590 - "All kinds" however limited here to land ice, sea ice and (marginally) inland water. Rephrase.