

Interactive comment on “A new 1 km digital elevation model of the Antarctic derived from combined satellite radar and laser data – Part 1: Data and methods” by J. L. Bamber et al.

J. L. Bamber et al.

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We are grateful to Helen for her comments on the paper, which are helpful and will result in a better paper at the end.

1) Combining DEM and validation papers. Helen suggests that we should combine part I and II. Originally, this was a single paper but as the work progressed we realised that i) there was more than we wanted to cover than was reasonable in a single paper and ii) more importantly, the material and methods presented in each paper, although linked, were very different and distinct. Paper I is geophysical and glaciological in nature while paper II is of a more technical and statistical nature. They discuss very different science and scientific issues. We believe, therefore, that it is more appropriate

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and more helpful to the reader to separate them.

2) Footprint size. Good point. We have added a short paragraph in section 2 to cover this.

3) ICESat data used. Helen is correct about additional data being available. When we wrote the first draft of the paper, less campaigns were processed to a reliable version number. We have, indeed, included all campaigns that have been processed to version R428 and have updated table 1 accordingly.

4) Figure 7. We have used the MOA grounding line instead as suggested.

5) Fig 12 replicates Fig 4c. Fig 4c and 12 are similar except that we use a different colour scale for Fig 12 and it shows, clearly, the location of the ICESat tracks and ERS data, which, unfortunately aren't visible in Fig 4c due to its size. Because this is such an important aspect of the DEM (the combination of ICESat and ERS data) we believe Fig 12 provides valuable insights not available in Fig 4.

6) Tides over the ice shelves. We have added a section describing the tide correction we applied (not the one on the product) to both the ERS and ICESat data over the ice shelves.

7) Add a geoid. Geoids are not standardised reference surfaces so we never provide DEMs WRT the geoid as the default product. Different users may have their own preferred geoid to use depending on the application and the location. We can, however, provide a 1 km geoid to use with the DEM if users want this and have added a comment to this effect.

8) Request to reference a paper by Fricker et al on the Amery. We have no doubt that this is valuable data set but it is not a global product (i.e. it does not cover the whole ice sheet) and there are quite a large number of other elevation data sets that we could mention in addition to Fricker et al that are excellent regional products. It is not our aim to discuss all the DEMs that have been produced for parts of (or all of)

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Antarctica in this paper and so it's not entirely clear why we should discuss this one and not, for example, Young et al, the CASERTZ DEM, several airborne and photo-stereographic products that exist and other satellite DEMs that have been produced. We do not want to undertake a review of all the elevation data that exists for Antarctica as this is another sort of paper altogether. We will, however, as part of the changes we are making, review the other work we discuss in section 1 of the paper to ensure that this is a fair summary of what is available at present and to make sure we adequately acknowledge the extensive amount of other work that has been undertaken in this field of research.

Interactive comment on The Cryosphere Discuss., 2, 811, 2008.

TCD

2, S497–S499, 2009

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