The Cryosphere Discussions

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Comment

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.

Anonymous Referee #2

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General Comments

This paper is well written and does a good job of documenting a dataset that substantially improves accuracy of the Antarctic digital elevation models. The effort to set an appropriate resolution and to provide an error assessment are noteworthy. Examples of studies that have used this dataset provide useful points of comparison for understanding the significance of the improved DEM product.

Specific Comments

The discussion in section 2.1 and Figs. 2 and 3 strongly implies that the decreasing

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bias from 0.25 to 0.5 slope is not corrected. If it is not, there needs to be a very strong justification for not correcting the entire effect. How do the authors justify the resulting discontinuity of the correction from the 0.25 degree threshold as the effect diminishes out towards 0.5 degrees. In figure 3 the legend shows that the bias correction reaches a maximum at 10 meters (again at 0.25 degrees), but the text and figure 2 show that the maximum correction was supposed to be ˜15 meters. The dataset is already in use by others, so perhaps it is a moot point to ask changes as this paper documents what already underlies those other publications. However, I believe it is critical that the authors clarify these apparent discrepancies.

End of section 2.2: It would be useful to see a scatter plot of the polynomial fit for weighting coefficients to slope angles, along with some measure of goodness of fit. The quality of this relationship is unstated.

The authors might consider the utility of semivariograms from the kriging literature for the purpose of determining the optimum sampling resolution. The relative uncertainty due to resolution is as much or more dependent on the spatial scales of variability in the data. There is no tradeoff for oversmoothing with the simple interpolation ratio that is used here.

There is no description of Figure 9.

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

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