

Interactive comment on “Spatially extensive estimates in annual accumulation in the dry zone of the Greenland Ice Sheet inferred from radar altimetry” by S. de la Peña et al.

Anonymous Referee #3

Received and published: 27 July 2010

The paper of de la Pena et al. investigates the estimation of annual accumulation using an air-borne altimeter. The paper focuses on a 200km transect on the western slope of the Greenland. The results show significant spatial and temporal variations of the accumulation. In addition, they show that the accumulation is over-estimated in ERA-40 with respect to the radar altimeter measurements.

The paper is clear, well organized and well written. The objectives are original and clearly stated. The methodology is well presented, the results are concisely exposed and the discussion is sufficient and convincing. I recommend this paper is published after the following minor revisions.

C574

I have two main questions/remarks.

1.

Were other transects measured during the campaign ? And if yes, why they were discarded from this analysis ?

2.

The authors mention Cryosat-2 as a possible space-borne equivalent instrument of the one used in the present study, and evasively mention a possible issue with the vertical resolution. I think a clearer conclusion should be given concerning the ability of Cryosat-2 to measure annual accumulation on the ice-sheets.

Detailed remarks:

p 771, l5: add value of the vertical resolution and of the footprint size.

P 771, l22: “as are” → “are”

p 772, l 5 – l13: the use of the term permittivity is incorrect. Use “refraction index” instead.

P 772, l15: give quantitative details about the snow density profiles (mean value, std, ...) and why not a plot of these profiles.

P 774, l7 and 8. I don't understand these two sentences.

P775, l24: “calbrated” → “calibrated”

p 776, l 6 and 7: I don't understand what should be concluded from this statement. Please detail.

P 776, l23: 30 years → 20 years

Fig 1: precise what the contour lines represent.

Fig 2:

C575

1.

the intensity of the surface echo should be reduced to highlight the others which are the only ones discussed in the paper. Maybe a log-scale of the intensity.

2.

Labeling the different layers with the year they were deposited (on the right or left of the picture) would greatly help the reader to follow the results discussion.

3.

I don't understand 10.5ns in the legend.

Fig 3: "For scaling purpose". This reason is unclear and is different from the reason given in the text.

Interactive comment on The Cryosphere Discuss., 4, 767, 2010.