

Interactive
Comment

Interactive comment on “Greenland annual accumulation along the EGIG line, 1959–2004, from ASIRAS airborne radar and detailed neutron-probe density measurements” by T. B. Overly et al.

T. B. Overly et al.

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1 Author Response to Anonymous Referee #1

1. Comment: “... Simonsen et al. (J. Glaciol., Vol. 59(215), 2013, pp. 545; not cited in the manuscript) report on the analysis of ASIRAS data from CryoVEx 2006 and 2008 campaigns over the EGIG transect and other sites in Greenland, addressing issues of firn compaction, etc. This paper is very relevant for the work presented by Overly et al. and should be referenced accordingly.”

C3280

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2. Author's Response: We agree Simonsen et al. 2013 should be referenced.
3. Author's Changes in Manuscript: We add a summary of Simonsen et al. (2013) and reference where necessary.

2 Author Response to Anonymous Referee #1

1. Comment: "... In Section 3.1 the authors present processing methods for ASIRAS data. Differences and advancements versus the previously applied methods should be clearly explained. Another technical issue, not addressed in the paper but of potential interest to the reader, are possible links between the work presented in this paper and the application of CryoSat-2 data for retrieving accumulation rates."
2. Author's Response: Though we agree that possible links exist between the work presented in this paper and CryoSat-2 data in the near-surface, the technical challenges of CryoSat-2 LRM reduced bandwidth (350MHz CryoSat-2 down from 1GHz ASIRAS) and increased footprint of CryoSat-2 relative to ASIRAS make the application of this analysis to CryoSat-2 problematic. We note that Hawley et al. 2006 included a section on this potential and we are happy to revisit this if the editor deems it necessary.
3. Author's Changes in Manuscript: We add clarifying text on the differences in our methods compared to Simonsen et al. (2013).

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3 Author Response to Anonymous Referee #1

1. Comment: "... High resolution accumulation data as provided by ASIRAS are of interest for validating regional climate models (RCMs). The Polar MM5 output shows consistent underestimation of accumulation compared to ASIRAS accumulation data (which agree with in situ measurements). This example is of limited relevance for assessing the performance of RCMs over Greenland, because it refers to one particular model and covers only a small section of the ice sheet. Additional comparisons with output from other RCMs (e.g. RACMO-2, HIRHAM-5) would provide wider evidence at least for the study region."
2. Author's Response: We have obtained RCM data for two additional comparisons, RACMO-2.3 and Modèle Atmosphérique Régional (MAR), and add those for comparison to ASIRAS-NP.
3. Author's Changes in Manuscript: We modify Fig. 4 to include RACMO 2.3 and MAR, and discuss these comparisons in Section 5.3, which we re-name ASIRAS-NP vs Regional Climate Models. We also modify Fig. 4 to display the grid-cell locations along EGIG for MM5, RACMO, and MAR. The modified Fig. 4 is included below, automatically labeled "Fig. 1" in this interactive comment.

Interactive comment on The Cryosphere Discuss., 9, 6791, 2015.

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9, C3280–C3283, 2016

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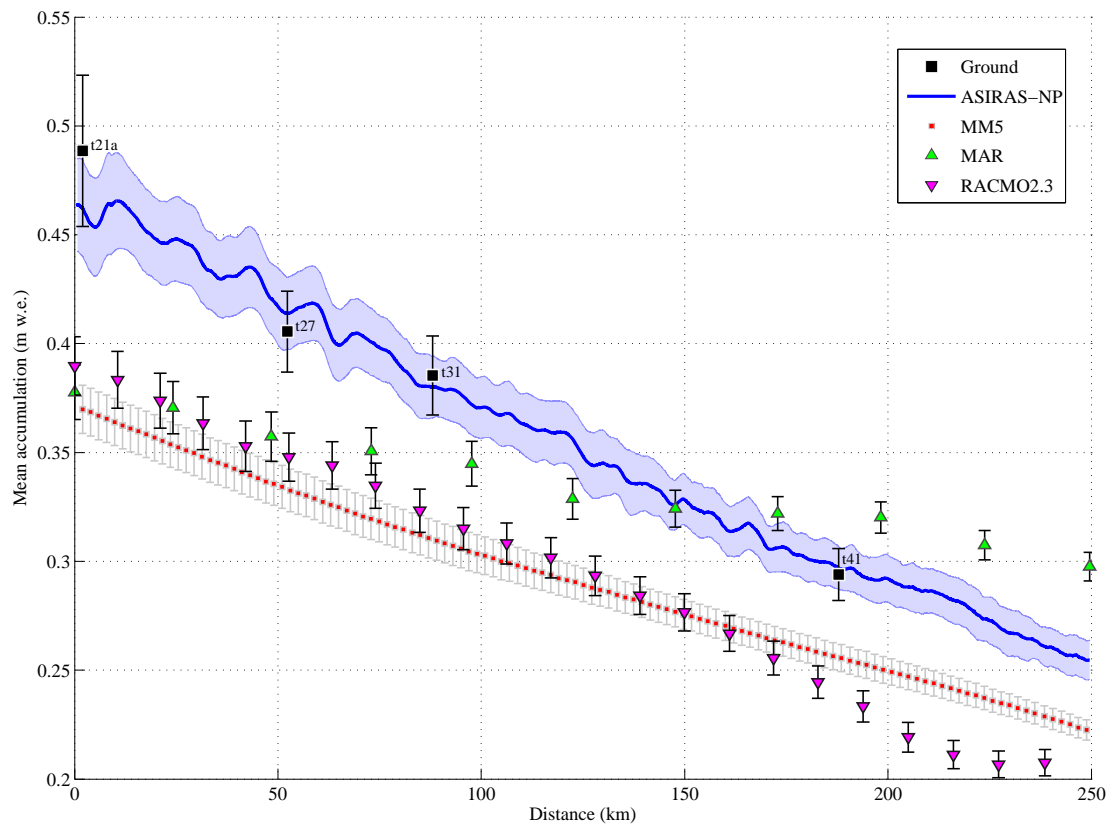
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**Fig. 1.**[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)