

Dear Reviewer,

The major revisions requested are categorized here, whereby each major Revision# is described in the file “MajorRevisions_TC_AP_RDatta”, also attached. Our response to minor comments are listed after.

Many thanks for your consideration.

Sincerely,

R. Tri Datta

Major Revisions:

1) Observational uncertainty

Original comment:

What about observational uncertainty of satellite data or uncertainties introduced by the postprocessing of satellite data? Would it be possible to include a specific errorestimate to better evaluate the model results and to take into account the observational uncertainty?

Response

In addition to more focus in the introduction, greater attention is given to the discussion of the spatial resolution of satellite sources, although the errors associated with the postprocessing of satellite data were difficult to quantify here. This is partially addressed in Revision #7, #8,

2) Driving reanalysis

Original Comment:

What about the impact of ERA-Interim as driving reanalysis data? Would it be possible to add it in the evaluation? Could the mentioned aspects of wind biases and thus resulting biases of melt occurrence have also their origin in the obtained large-scale atmospheric information given by the boundary condition?

Response:

This has been addressed in Revision #4

3) Additional model deficiencies

Original comment:

Could the mentioned cold bias in MAR (when maximum temperature and average daily temperature exceed 0 degree Celsius) origin from other model deficiencies as well? So far only wind is considered.

Response

Other potential causes for melt are highlighted in greater detail in the results

P15 L9-17

The potential effects of horizontal and vertical resolution are also expanded upon (although these do relate to wind flow). This is discussed in Revision #1.

4) Excessive abbreviations

Original comment:

In Section 4.2 and 4.2.1 there are many abbreviations introduced which makes it a bit difficult to read. Would it be possible to already introduce those in the methods part and provide a table as overview? Or maybe it is possible to reduce the amount of abbreviations used in the text.

Response:

This now includes an overview table as Table 1

5) Comparisons with other studies

Original comment:

It would be interesting to discuss presented results (e.g. the underestimation in melting in the center and east of the Larsen C ice shelf) in greater detail to other studies e.g. to other regional climate model studies over the Antarctic region or in general in terms of e.g. issues in snow melting (e.g. onset and ending) in other regions. Also GCMs might have similar issues that would be of interest to consider.

Response:

We have altered the text to emphasize the relative advantages/disadvantages of hydrostatic vs. non-hydrostatic models and an intermodal comparison with the hydrostatic model RACMO2.3p2 (Revision #2, #5)

Response to Minor Comments:

- Page 3 l. 29 + l. 33: use same space before unit – corrected, P3, L23
- Page 4 l. 20: change to föhn Paragraph reordered
- Page 5 in section 2.1: Please mention the size of the model domain
Lat/lon boundaries added in P 5 L25
- Page 5 l. 2: explain abbreviation RCM
Term now fully introduced in Introduction P3, L14,15
- Page 7 l. 6: add space after where Paragraph reorganized for clarity
- Page 7 l.35: remove space before Wilks - corrected, P8, L33
- Page 12 l. 34: citation with 2 brackets - corrected, P15, L12
- Page 34 l. 34: remove second brackets (assuming related to the previous comment)
- Page 18 l. 8: remove slash in Royal - corrected, P21, L19
- Page 24 l. 5: add space before Greenland - corrected
- Figures:
- Fig. 1: Please add coordinates to the axes – added
- Fig. 2: Please add coordinates to the axes – added, Now Fig. 5
- Fig. 3: Please have a consistent labeling of axes throughout all the figures 1-8; variable [unit] - corrected
- Fig. 4: Same as Fig. 4 - corrected

Fig. 7: ended with a comma] – corrected, Figure now combined with previous figure.

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