

Interactive comment on “Reconstruction of the Greenland Ice Sheet surface mass balance and the spatiotemporal distribution of freshwater runoff from Greenland to surrounding seas” by Sebastian H. Mernild et al.

Anonymous Referee #2

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I fully agree with review #1 that this paper can not be accepted in the present state for publication in TC due to the lack of a robust validation of the presented results. In addition, except Section 4.2 which is a bit interesting, the scientific interest of this paper is very poor and clearly not innovative (e.g. Section 4.1 which is just a confirmation of previous studies)! The mean 1979-2014 SMB over GrIS, the 2012 melt record year and the recent increase of runoff (and corresponding refreeze capacity decrease) in link with changes in AMO and NAO have already been shown and discussed in many papers like the ones from Hanna, Fettweis, Noel, Wilson, . . . Finally, the studied period

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is limited to 2014 while ERA-Interim is available until Oct 2017! The results seem to be a bit outdated.

Line 132-133: The interest of this new version of the SnowModel in respect to the results of Mernild and Liston (2012) should be shown and discussed with validation data.

Line 251: What do you mean by “acceptable results” ?

Line 338-343: only a 2D validation with MAR results should be useful here. A comparison at the scale of the ice sheet is not enough ? Why is there a such underestimation in respect to MAR ? In each area? MAR is not the true and a comparison with the Bales et al. (2001, 2009, . . .) ice cores measurements should be useful here.

Line 316-318: SnowMOdel generally agrees with . . . It is not a validation! What do you mean by “generally agrees” ? A validation with the PROMICE SMB data set is absolutely needed.

Fig 2: showing mean SMB without a validation or without a 2D comparison with other models (e.g. MAR or RACMO) is not interesting for me.

Fig 3b: what is the interest of showing the 2 last figures?

Fig5: these figures are not readable.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2017-234>, 2017.

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