Retrieving frozen ground surface temperature under the snowpack in Arctic permafrost area from SMOS observations

Comments from Reviewer 2 / Christian Matzler

Comments from the reviewer
Answers from the author

The authors want to thank again Christian Matzler for the valuable comments.

'The new version shows improvements. But I still miss a clearer statement on deficiencies in the retrievals due to the temporal variation of areas with liquid water, and how this problem may be solved. Some information may even exist in the present data. By far the best results were obtained during the short period of available data in 2016 (Figure C1) for Inigok. Also in other years, the spring data seem to perform better than during the winter season.

We consider that the "*areas with liquid water*" you mention refer to the open water / water bodies / lakes area. The subsection "5.2.1 Effects of the snow and ice-covered water bodies" is meant to highlight the spatial and temporal variability of water bodies and the faced limitations in our modeling. The use of the Hr,wi parameter is proposed as a "fixing" solution. The subsection "5.2.2 Analysis of a site with high water fraction (Inigok)" expands the discussion by looking at a specific site (Inigok). We added a comment about your relevant observation: "It is worth noting that the $\Delta \bar{T}$ are smaller in late winter, suggesting that early winter lakes freezing processes require a different dedicated modeling." (lines 404-406).

Figures 5 to 7 include data that are not defined: the tiny points (very small rings). The captions in these figures refer to other figures (in Figure 7 erroneously to Figure 7 again). I think that such information belongs in the main text. The figure caption should define the symbols, curves etc. of the associated figure, only, to avoid confusion, and to make it simpler for reading. In the caption to Figure 7, the reference to the x axis should be: "probing depth below the soil surface".'

Many thanks for pointing out the residual inconsistencies and typos.