Abstract

Line 4: the sentence starting "The number …" is unclear and should be rewritten.

Line 19: There is a jump between description of MAGT derivation and permafrost derivation.

Line 21: The sentence starting "This applies …" should be rewritten, as there is no reference before to the C-band.

Introduction

Page 3, line 13: What input data?

Page 3, line 19: I guess this should read "… and it represents the state …"

Sections 4.2.1 and 4.2.2

I find it in general easier to understand differences between model and observation if they are presented as model minus observation, because positive differences than imply a warmer model and negative differences imply a colder model. I would change the differences for Figures 4, 9, 10, and 14.

Section 4.2.2

Page 9, line 6: what does offset mean in this context?

Page 9, line 10: Why is the landcover class figure 14, and not figure 10?

Page 9, lines 10 to 15: This discussion is not very precise. The differences among the land cover classes as well as the differences among the soil organic matter classes are of similar magnitude as the differences among permafrost states and among different SWE classes. I think your results merit some further discussion!

Page 9, line 14: I do not see strong variations between the years for soil organic carbon.

Section 5.4

Page 14, line 12: I do not agree with your statement that landcover seems to be of minor importance for the quality of your derived $MAGT_c$. See comment to Page 9, lines 10 to 15

References

You need to check a number of your bibtex entries for accuracy.

Page 17, line 15: in "supplement to: Bartsch, A." the dot is missing

Page 17, line 33: after Figa-Saldana, there are two commas.

Page 18, line 14: there is something wrong with P.Kuhry

Page 19, lines 25 and 27: everywhere else, you refer to Vladimir Romanovsky as V. E. Romanovsky. Here, the E. is missing.

Page 20, line 18: The name of the journal needs to read The Cryosphere.

Figure 2:

It would be good to see the 1-on-1 line for the "perfect fit" in the three right panels.

Figure 6:

It would be easier to compare this figure to figure 3 if the differences had been computed in the same manner (ASCAT-SSM/I versus SSM/I-ASCAT)

Figure 7:

See comment to Figure 6.

Figure 8:

Please add a zero line for reference in all three panels.

Appendix A:

In the description of the regions in the figure caption, CR is missing.