

The revised version of the manuscript „Potential permafrost distribution and ground temperatures based on surface state obtained from microwave satellite data“ is significantly improved compared to the original manuscript. It is well structured now, clearly states its purpose of discussing the possibility of deriving permafrost extent and possibly MAGT purely from observational satellite data and delivers a meaningful discussion of the uncertainties in the results. All questions concerning the methods used have been addressed properly.

I have some minor comments, all technical in nature, as follows:

Abstract

line 3: “the simplification” refers to the sentence before, changing to “this simplification” clarifies that

line 12: substitute the last word “what” by “which”

Introduction

page 1, line 7: “it’s distribution” needs to read “its distribution”

page 1, line 32: I assume you mean low annual mean air temperature. If so, add “air” to clarify this.

page 3, line 22: “same” needs to read “some”

section 2.2.1

page 4, line 33: MAGT as abbreviation for Mean Annual Ground Temperature has been introduced already in the introduction

page 4, line 33: add a comma after “In total”

section 3.1

page 5, line 24: MAGT as abbreviation for Mean Annual Ground Temperature has been introduced already in the introduction

page 6, line 2: “due e.g” should read “due to e.g.”

section 3.3

page 6, line 18: “what allowed us” needs to read “which allowed us”

section 4.1

page 7, line 24: the sentence about the R^2 value is not very well formulated. I suggest something like “ R^2 between MAGT from meta data records and MAGT at coldest sensor depth is 0.994 (Fig. 1).” Also, I’m not sure what R^2 is meant to tell me here on its own. The important information would be that the slope of the linear fit equals one with a good R^2 . If you doubled all MAGT values at coldest sensor depth and redrew the diagram, R^2 would have the same value, but the slope

would be two, which is not what you want to show. R^2 as a “proof” for a linear relationship is good, but you want to demonstrate that MAGT from the coldest sensor approximately equals MAGT from the meta data, so you also need to discuss the slope of your fit.

page 7, lines 28 & 29: I would extend this sentence to clarify: MAGT at coldest sensor depth seems to be also valid as a substitute for MAGT at ZAA in non-permafrost regions ...

section 4.2

page 8, line 4: substitute “extent” for “region” to clarify the sentence

page 8, line 8: add a comma after “In general”

section 4.3

page 8, line 22: add a comma after SSM/I to clarify the sentence

section 5.1

page 11, line 29: “from borehole to borehole what may impact” needs to read “from borehole to borehole which may impact”

page 11, line 30: “for calibration what may weaken” needs to read “for calibration which may weaken”

section 5.4

page 13, line 23: Scandinavia instead of Skandinavia

References

There are several inconsistencies in abbreviating journal names (eg Remote Sensing, PPP). Please check!

page 16, line 13: the end page of the article is missing

page 16, line 13 & 17: Bartsch et al. 2016 needs to be Bartsch et al. 2016a and Bartsch et al. 2016b

page 16, line 14: I am not sure where this paper is cited. It seems to me that all references to Brown et al. 2007 should actually be references to Brown et al 1997 (see comments on Figures and Tables)

page 16, line 22: CLimatology needs to read Climatology

page 16, line 27: the pages are missing

page 17, line 1: European instead of european

page 17, line 10: the doi is missing

page 17, line 14: the doi is missing

page 17, line 37: the pages are missing

page 18, line 6: the pages are missing

page 18, line 8: the issue is missing, the pp. before the pages needs to be deleted

page 18, line 11: the doi is missing

page 18, line 16: the doi is missing

page 18, line 35: pages and volume are missing

page 18, line 37: the doi is missing

page 19, line 7: the pages are missing

Table 4

This should refer to Brown et al (1997).

Table 5

“based on” should be removed once

Figure 4

I would suggest to add the satellite product the rows refer to to the panels in the figure to increase readability.

Figure 6

The reference should be to Brown et al (1997).

Figure 9

The reference should be to Brown et al (1997).