

***Interactive comment on “Comparison of
MODIS-derived land surface temperatures with
near-surface soil and air temperature
measurements in continuous permafrost terrain”
by S. Hachem et al.***

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Major comments:

Introduction section: LST in relation to GST and Tair has been added. Also, the implications of snow and vegetation on LSTs are mentioned in the introduction.

Results section: To lighten the text and erase any confusion, we removed three figures (difficult to read) and replaced them by four tables. The text is now properly related to the tables. We also paid attention to sequence the figures and tables in the order they

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appear.

Discussion section: As we widely explain, the interest by the permafrost community in using LSTs is discussed in the Introduction and in the Conclusion. Also, as the suitability of MODIS is explained in the Data and Methods section, we consider that we have now answered this question. As a result, we did not add a more general discussion.

Specific comments:

P.1585 :

I.21 : We do not understand why a textbook cannot be a reference here? But we deleted it.

p.1590 :

I.11 : LSTs are given with 2 decimals, and loggers with 1 decimal. We thought that the Mean difference could be given with 2 decimals also. We changed our decimal results to 1 decimal.

p.1592:

I.5-12: The paragraph has been moved to the previous section 2.1.

p.1595:

I.23: The words morning and evening have been deleted and an explanation of what is called Day and Night LSTs is given in section 2.1.2.

p.1596:

I.12-20: The paragraph has been moved to section 2.4.

I.14: “depth” instead of “deep” changed.

I.24: “Table 4” is changed to “Table 5”.

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I.25-26 and I.1-3 p.1597: We have been more precise about explaining MD, SD and R, in section 2.4 : “Three statistical parameters were computed to compare MODIS LSTs with Tair and surface temperatures (GST) from meteorological stations: the Pearson correlation coefficient (R), the mean difference (MD) and the standard deviation (SD). The correlation coefficient was used as a measure of the temporal coherence/match (co-variation in time) between LST and station temperature measurements (Tair and GST). The mean difference (Tair – LST or GST - LST) was utilized as a measure of the difference between the two sets of data. The SD was used to verify how large the variability around the Mean MD was.” Table 5 has been modified to make it clearer and SD values have been added.

p.1597:

I.1: “colder” has been changed to “lower”.

I.4: “than GST during daytime” instead of “than daytime”. A new table, Table 5, has been added which relates values between GST and LST. As a result, relations between Tair and LST are now in Table 7. A new table with info on GST during the snow free season has been added (Table 6) along with SD values included.

p.1598:

I.8: Fig. 2 becomes Fig. 3 and Fig. 3 has been deleted.

I.8-9: This sentence has been changed as suggested : “differences are larger in winter than in summer”

I.13-15: Moved to the Data and Methods section (2.4).

I.19-25: The entire paragraph has been rewritten with a better explanation. It is now moved to section 2.4

p.1599:

I.1: “orange” is written instead of “red”.

I.6-8: The entire paragraph has been rewritten.

I.24: “lower” is used instead of “smaller”.

p.1600:

I.5-6: The entire paragraph has been rewritten.

p.1601: Section 4 has been rearranged with new heading levels.

p.1602: Figure numbers have been verified and corrected as needed.

p.1603:

I.6-11: This info has been moved to the Data and Methods section.

p.1604:

I.17-27: As the section has been rearranged, the Discussion does not mix the soil and air temperatures analysis anymore.

p.1605:

I.8 : We did not evaluate the freezing and thawing indices as it was already evaluated by Hachem et al (2009). It has to be explored with new models incorporating other data as it is mentioned in the conclusion

Figures:

Figures 2, 4, 5 have been deleted and substituted by tables.

Figures 6 and 7 are LSTs (color dots) superimposed to Tair (black continuous line).

Interactive comment on The Cryosphere Discuss., 5, 1583, 2011.

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