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The Cryosphere Discussions

Interactive comment on "Temperature variability and thermal offset in steep alpine rock and ice faces" *by* A. Hasler et al.

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This manuscript represents a substantial contribution to the study of temperature conditions in mountain permafrost and is clearly within the scope of The Cryosphere. Based on an extensive measurement setup, the authors present unique results on variability in annual mean temperatures for variable surface and near surface characteristics in steep alpine rock and ice faces. Especially the observed ventilation effects in clefts in steep rock walls, and effects of snow cover on mean annual temperatures in radiation-exposed faces are major contributions.

However the paper can easily be made clearer in some places and parts of the text could be reduced. The "Discussion" is partly difficult to follow and last part of the "Introduction" is rather long (part of this could be moved to the "Discussion"). I will

recommend that it should be published but with changes and suggestions as indicated above and below. In addition there are some comments that need further clarifications and considerations before the paper is acceptable for publication:

Specific comments:

P726, “Instrumentation”: As it stands now the description of measurement setup needs some clarifications to allow their reproduction by fellow scientists. A few more lines from Beutel et al. (2009) and Hasler et al. (2008) would help.

P723, L27: In a recent study in southern Norway (also performed on gentle mountain slopes), MGST varied by 1.5-3.0°C over distances of 30-100 meters (Isaksen et al. 2011). You may consider to also including this.

Ref: Isaksen K, Ødegård RS, Etzelmüller B, Hilbich C, Hauck C, Farbrot H, Eiken T, Hygen HO, Hipp TF. 2011. Degrading mountain permafrost in southern Norway - spatial and temporal variability of mean ground temperatures 1999-2009. Accepted for publication in Permafrost Periglacial Processes.

P730, L19-27: This section needs some clarifications

P731, L21: I can not see any data on MAAT in Figure 7!?

P732, L7-8: The use of the abbreviations, MAT, MAGT etc is not totally clear. Please make this clearer and be consequent in the rest of the paper.

P732, L14: Replace “warmer” with “higher” (e.g. temperatures are “higher/lower”, not “warmer/colder”)

P732, L24: Replace “later one” with “latter”

P732, L26: Replace “other publications” with e.g. “traditionally found in literature”

P733, L3-8: Consider to include some of this in caption (Fig. 8).

P733, L12: Replace “warmest” with “highest”

TCD

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P733, L14: include “located” –> “. . .positive TO are LOCATED relatively flat. . .”

P734-737, Discussion: Consider splitting up the discussion with 2-3 subheadings to make it easier for the reader. As it stands now, parts of the text are a little hard to follow.

P737, L24: Replace “colder” with “lower”

P738, L6-25: Consider to move this text to “Discussion”

P743: Table 2 text: What is “563”?

P 751: Capitalize the first letter of the y-axis

Interactive comment on The Cryosphere Discuss., 5, 721, 2011.