

Interactive comment on “Avalanches and micrometeorology driving mass and energy balance of the lowest perennial ice field of the Alps: a case study” by Rebecca Mott et al.

Kuhn (Referee)

michael.kuhn@uibk.ac.at

Received and published: 14 December 2018

The manuscript "Avalanches and micrometeorology driving mass and energy balance of the lowest perennial ice field of the Alps: a case study" by Rebecca Mott et al. gives a well written account of an exceptional set of measurements and simulations. Among others, Fig. 9 is absolutely novel and important for the understanding of the balance of such ice fields.

Other groups are presently investigating the fate of the remnants of decaying larger glaciers. In order to enable them to make use of the findings and experience of Mott and co-authors, I recommend fast publication of this paper with the following minor

C1

changes.

Check the punctuation in the entire text. Use decimal points rather than commas. Use uniform format of the date. There is Oct 26, 2017; 29 Sep 2018; 12-09-2018... (With my restricted background I was not able to judge the performance of instruments and methods of the surveys mentioned in 2.2.2.) As I am not sure whether the deposits around the ice field would all be considered as moraines by strict geomorphologists, I suggest you state something like "we refer to moraines as any rocks that have been moved in, on top of, or under the ice field and have been deposited close to it"

In particular Page 2 / Line 8: As an example of the size distribution of glaciers in Austria quote M. Kuhn, A. Lambrecht, J. Abermann, G. Patzelt, G. Gross 2012: Austrian Glaciers 1998 and 1969: Area and Volume Changes. Zeitschrift für Gletscherkunde und Glazialgeologie 43/44 (2009/2010), 3 – 107. 2/24: 1995 Table 1: in this context, can you mention whether any of the parameters used needs to be known to better than +- 10%, +- 1 degree, or +- 0.1m? 5/12: varying by less 6/15 An atmospheric 6/28 generates 7/24 Add results given here either to Table 1 or insert a new table here, including volume change. 8/6 in winter 2017/2018 (Figure 6) was obtained 8/7 snow depth at 8/14 on this day 8/18 the Small Ice Chapel 8/19 of snow deposition. With less than 0.5 m snow accumulation, most areas 8/22 Areas which are not prone to avalanches, such as 8/31 Is some of that accumulation attributed to "solid precipitation" possibly contributed by airborne powder avalanches? 9/6 – 24 This is awkward to read. Can you summarize these changes in a small table, maybe using months instead of seasons, like "October 2017 and September 2018" in line 8, and shorten the text? 10/5 Maps of air temperatures 2 m above the surface 10/7 present. Under uniform solar radiation, measurements evidence 10/12 resulting in an air 10/22 using an IR camera 10/27 It is "Grudzielanek" in the reference list. 3.3.2 Can you estimate the so called free air temperature at the ice field elevation from the records at Kührioint (1420 m)? 13/34 Mention strong IR Radiation from the surrounding rocks. 14/14 change 14/20 ice fields is due to the 14/27 involves 16/37 year of appearance? 17/51 Zeitschrift für

C2

Gletscherkunde und Fig.1 A larger map, e.g. including Salzburg, would be helpful. Fig. 1 Shift the legend of the middle panel on the right to the white background Fig. 3 The areas under each year are barely legible. Fig. 8 The color code is difficult to distinguish. Fig. 9 Explain the numbers in the upper left panel. Fig. 9 The color code on the right margins is difficult to read. Can you present just one at a larger scale? Fig. 10 Why is the dashed line limiting the cold air flow in the panels 10 d and 10 f not at the same x-direction? Fig.11 Maybe 50.5 – 500 and 500.1 – 700 would be sufficiently accurate. Fig.11 Which of the panels belongs to which date?

Best wishes, Michael Kuhn

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-255>, 2018.

C3