

tc-2021-163-referee-report 2 for Referee #2: Fierz, Charles

- Review or not review? I must admit I missed that the editor of the paper must be contacted prior to submit a 'review article'. Thus I guess the editor made his mind up beforehand and I will leave it with him to decide. However, I apologies for my 'quick and dirty' proposal for a new title. The one put forward by the authors is much better suited.

The editor seemed to think, at first, that it was more of a review article. But, I leave to the editor to confirm what he thinks is most appropriate. From my point of view, as well as that of the co-authors, a Review article would be more adapted to this article.

- Water equivalent of snow cover and mm w.e., lines 53 & 55: I of course very much appreciate that the authors took up these suggestions. However, it should then be used consistently throughout the paper. I marked a few instances in the manuscript, but please, check your text carefully.

Done

L63 Not found in reference list. Haberkorn?

Added: Haberkorn, A. (eds): European Snow Booklet – an Inventory of Snow Measurements in Europe, 363 pp., 2019.

L141 Figure 1: I think the recommendation by F. Appel is to remove the dotted red arrows arriving at antenna 1 (see my blue crosses). I would strongly suggest to do so!

Figure corrected. You are right: the red arrows for (1e) should not be shown! There were removed.

- Line 91, "... to follow an event of a short winter storm." and line 489, "daily mean values"

Looking at Figs 3 & 4 again, I realised you did not address problems related to short term reliability of these instruments. Indeed, on Fig. 3 the CRNP shows sudden drops (up to 20 % in SWE around 16 Feb 2009, for example) while SD remains unchanged. Also, on Fig. 4, after 16 March 2018 the signal of the GMON is quite noisy while SD settles but is quiet. This behaviour of course affects strongly the results if working with daily changes – common application in snow hydrology - and I wonder whether you could comment on this shortly in the text.

Interesting remarks, but the comparison of SWE variations cannot always be compared with those of the snow height according to the type of event (variable effect of densification).

A brief section was added to comments on short met. events (snowfall and or rain):

*Precipitation (snowfall and rain) is also plotted, showing how GMON and CRNP develop with each event. But for studying short meteorological events, the measurement period*

*linked to the instrument should obviously not be too long to be able to account for rapid changes in SWE. This can be seen in Fig. 3 showing higher variability in SWE derived from CRNP based on counts accumulated over 1 hour than those derived from GMON based on counts accumulated over 6 hours. Moreover, small snowfalls on top of a thick (denser or wet) snowpack were not always detected. Further studies are needed to address problems related to short term (sub-daily) reliability of these instruments.*

- Footprint: it is now defined in the paper but very late (line 701) while it should be done on line 202.

Note: While I agree with Craig that something like 'measurement area' would better fit, I understand that your definition somehow relates to 'satellite footprint'. Fair enough.

Done. The definition of the "footprint" is now given in Figure 1

- Further typo-like corrections can be found in the annotated manuscript.

Done. Annotated manuscript scanned.