

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2021-163**

Anonymous Referee #1

Referee comment on "Remote and autonomous measurements of precipitation for the northwestern Ross Ice Shelf, Antarctica" by Mark W. Seefeldt et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-163-RC1>, 2021

The manuscript of Mark W. Seefeldt et al. provides an impressive overview about a multi-year precipitation dataset from 4 different Antarctic sites. From the description of the three 1-year periods the efforts, which were required to be taken in order to realize the data acquisition, become obvious.

Most points are well addressed within the manuscript. I don't see need for major revisions. The content fits well into the scope of the selected journal. During reading, it becomes also clear that the manuscript is definitely no scientific article, but a worthwhile technical dataset report.

However, I would still like to ask the authors to read and address the following minor comments. From my feeling, seeing them addressed in the manuscript would increase the information content significantly.

Minor comments:

Introduction:

- In the second sentence the authors mention big challenges (small amount of precip, distinguishing between falling snow and blowing snow) but don't provide references which discuss them (or 'introduce' them as a challenge). Could the authors provide some fitting references?

Figures 2,3,4 and description of instruments in Section 2.2/2.3:

- It would be really helpful to name the single instruments (e.g., add numbers to each instrument and add a legend). For instance, I was not able to identify the location of the ODP-104. It would anyway make the instrument description section much easier. E.g., table 2 could provide the respective instrument numbers which I suggested to add to Figures 2, 3, and 4.
- Why is the Parsivel² on Figure 2 tilted (by 45°)? I contacted OTT Hydromet company and asked if there is any possibility to correct the effects of a tilted disdrometer on the derived fall velocities, particle size, precipitation rates, kinetic energy, etc (as the rotation also reduces the effective detection area of the band laser). OTT responded and told me that there's no option to modify the raw-data processing, nor was there ever any request to implement a modified data processing algorithm into the firmware. In general, I missed a description of the setup and performance of Parsivel² in Section 2.x. Would be nice to have one added. Maybe the tilting was due to another focus? Detection of blowing snow? Would be really nice to read about this!

Section 3.3:

- What happened to DFAR in season 3? Did the 'unshielding' improve anything? Did it have negative effects?

Snow height measurements:

- Figures 5 and 6 show sudden jumps in the measured snow height which are reported to be caused by instrument maintenance or relocation. Can the authors provide a recommendation about how to interpret the data? For sure, the snow height timelines cannot just be used to interpret snow accumulation. So what needs to be done in order to make the snow height measurements usable/interpretable? Ideally, the authors should provide a cases study of the correction procedure (to remove the instrumental effects from the actual snow accumulation evolution).

Section 5 and Conclusions:

- I was somewhat disappointed after having read the whole manuscript. No recommendation for which instrument is the best one??? Can't the authors provide a suggestion about which kind of instrument should be preferred? I definitely see need to add a paragraph into the conclusions section in which the pros and cons of the individual instruments are discussed. Or are there other publications, which provide some guide? Some statement about recommendations could also be added to the end of Section 5, where Fig. 6d is discussed (Lines 433-436).

Typos/Grammar:

Line 27: "...on Earth and it is ..."

Line 70: "...measurement studies ..."

Line 423: Suggest to modify: "Figure 6e shows the large variability in snow height during high wind...."