

Comment on **essd-2021-68**

Anonymous Referee #3

Referee comment on "Operational and experimental snow observation systems in the upper Rofental: data from 2017–2020" by Michael Warscher et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-68-RC3>, 2021

General comments

The authors present an extension of their previous ESSD publication that focuses on automated meteorological and snowpack observations collected in an alpine environment in Rofental, Austria. The authors followed the ESSD living data process to guide this manuscript, and accordingly nicely focus on extensions of the time series, instrumentation upgrades, and descriptions of some new instrument installations that offer additional insights into snow cover processes. I found the article easy to follow and was able to download and plot some of the data relatively easily, suggesting this data is readily accessible for future research applications. However, I did find some of the data incomplete and lacking a proper description of errors and uncertainties (see comments below).

Specific comments

- Based on Fig. 6 it looks like some of the snow depth and SWE measurements have some missing values. Please specify why in the text. Overall the text is light on descriptions of the uncertainties in the measurements, with only the instrument resolution listed in the tables. The paper would benefit from better discussion of sources of error.
- Some of the time series for the new sensors are relatively short in duration, such as the snow measurements at Proviantdepot. It would make sense to include data from the entire 2020-2021 winter season now that it is mostly completed.
- When downloading the tab-delimited data I found it difficult to work with the column headers because the variable name, units, and method/device details were all in the same cell. If working with a scripting language like R or Python it is much easier when the columns can be indexed with short concise name, in which case the units and descriptions could be on their own rows. That being said, I am not familiar with the standards and limitations of the PANGEA data platform.

Technical comments

- Line 118: Please define the acronym "GSM"
- Lines 155-157: Please provide more description of the SPA instrument, and how it can be used to calculate density and SWE as later shown in Fig. 9.
- Line 167: By "daily values" I assume this means daily averages.
- 5 and 6: These plots are missing the subplot labels (a-f)
- Fig 9: Would it be more logical to move snow depth from subplot (d) to (a) since it is the first plot discussed in the text?
- Line 301: Can you provide an actual distance instead of "in close proximity"
- Table 4: I don't understand the need for the final 2 rows in this table since they simply repeat the same values. It's also unclear why some values are in italics. Perhaps the 6 unique values presented in this table could simply be stated in the text, along with an explanation of how they relate to each other.
- Fig 13: The caption description of the avalanche should use proper avalanche terminology. The edges are called 'fracture lines' with the one along the top called a 'crown' and the ones along the sides called 'flanks'.