



EGUsphere, referee comment RC1
<https://doi.org/10.5194/egusphere-2022-938-RC1>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Referee Comment on egusphere-2022-938

Anonymous Referee #1

Referee comment on "Automatic snow type classification of snow micropenetrometer profiles with machine learning algorithms" by Julia Kaltenborn et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-938-RC1>, 2022

The manuscript presents the compilation of several machine learning algorithms for the classification of snow types of snow on Arctic sea ice from SMP penetration force profiles. The authors describe the functionality, pros and cons of each model set-up, and determine that ANNs outperform other types of supervised and semi-supervised learners at this task. An exploration of this manuscript was to determine if semi-supervised learners could accurately classify snow type from a subset of the 164 snow-type labeled SMP profiles. I found the computer science aspect of this work to be quite complete and presented at a high enough level for the comprehension of a general reader after some additional clarification on the language. As it is presented, the hypothesis is developed and tested, and a best model is determined. Discussion regarding the practitioner's choice of model set-up within the snowdragon software package is provided for adapting this work to other SMP datasets and archived for reproducibility. I am recommending this manuscript for minor revision prior to acceptance as some aspects of the experimental design need further explanation or clarification. Addressing the provided comments may help increase the scientific quality of the manuscript, as much of the evaluation of the results remains qualitative. I do find that additional snow-related analyses and uncertainty analyses of these data and model predictions could be incorporated in this manuscript to increase the scientific significance. For this reason, I have scored Scientific Significance as "Good". However, as the scope of the manuscript is defined, it is complete in the analysis of machine learning classification of snow type.

General and Specific comments to the authors are provided in the attached .pdf document.

Please also note the supplement to this comment:

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-938/egusphere-2022-938-RC1-supplement.pdf>