Comment on tc-2022-80

Ron Simenhois (Referee)

Referee comment on "Automated avalanche mapping from SPOT 6/7 satellite imagery with deep learning: results, evaluation, potential and limitations" by Elisabeth D. Hafner et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2022-80-RC1, 2022

This manuscript describes an important and interesting work toward automatic avalanche detection from visual spectrum satellite imagery. Also, I am very impressed with the work to build the dataset to train, evaluate/calibrate and test. Overall, the manuscript clearly describes the methods and the results of this project. However, I have a few comments on the manuscript that need to be addressed. These are initial comments to start the discussion. I will add more comments soon.

I agree with the authors on the importance of avalanche detection from optical satellite data. Still, the authors' reasoning for using optical images is narrow and specific to the existence of a specific dataset. Are there other, more general reasoning for using optical images in addition to SAR images? I would like to see more reasoning for using optical satellite images for the avalanche field in general.

The majority of the readers of this journal are not AI specialists. I will increase this paper's readability if the authors add a short non-technical description of the DeepLad3+, what it is, and what it does.

Specific comments:

Line 78: This is the first time the term "expert" appears in the paper. Please elaborate on who the expert is and what their role is.

Lines 84, 86: Aren't POD and PPV probabilities (a number between 0 and 1)? Why are you using %?

Line 101: add a reference to ResNet

Line 101: Just out of curiosity, Chen et al. (2018) show better results with a version of Xception. Why did you decide to use the ResNet encoder?

Line 110: Doesn't it need to be Figure 2?