Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC2
https://doi.org/10.5194/amt-2022-72-RC2, 2022

Comment on amt-2022-72

Anonymous Referee #2

Referee comment on "Ice crystal images from optical array probes: classification with convolutional neural networks" by Louis Jaffeux et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2022-72-RC2, 2022

Review of AMT_2022_72

The manuscript is nicely organized and written (minus some typos/spelling that do not detract from the narrative). The description of the CNN is very clearly laid out and easy to follow (even for a non-expert in ML). The approach to doing fewer categories is smart and I think yields more robust results that will be useful for other datasets. I really like Table 3 – it is an excellent visual to help understand the classification method.

In general – I would say the manuscript needs some minor revisions before publication. I would recommend a careful re-read of the revised manuscript for spelling, typos, and clarity.

Major Comments:

- It is mentioned that ~8000 images are used from 4 different field campaigns. However, it is not discussed how many individual precipitating events are included (1 from each campaign?). I am curious about how much biasing or co-variability could be potentially introduced when training the dataset and knowing how many separate events were used would help better understand the breadth of environmental conditions.
- Related – there is not much description about the airborne campaigns from which the data originates (there is a brief mention in the conclusion). It would be helpful to have some more context earlier on in the paper.
- I missed where it is detailed how many particles are represented in each category from the datasets – for the training, do you have similar numbers of particles for each class type represented?
- The matrices in Fig. 5 and 6 are a little hard to understand. Could you please add some details to the description or clarify as to how you are calculating these percentages?

Minor Comments:

- There are minor mis-spellings throughout the document (e.g., convolutionnal, functionnality, etc.). There are some passive phrases and word usages that could use revisiting. An additional readthrough by the co-authors should be able to address these issues.
- Page12, L242 – 245: This sentence is unclear and very long. Could you split it up and clarify the points here?