

Evaluation of micro rain radar-based precipitation classification algorithms to discriminate between stratiform and convective precipitation

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Response to referee #2 report

We like to thank the reviewers for providing helpful comments to improve the manuscript.

We made minor changes according to the referees suggestions. All changes are highlighted in the diff-manuscript below. Added text is wavy-underlined and blue, discarded text is struck out and red.

The reviewer comments are listed below in black. The authors response is written in blue.

General comments:

This paper proposes to discriminate MRR measured rain patterns into stratiform, convective and inconclusive categories, based on the sole MRR observations. Therefore, it compares two dedicated approaches, i.e. Probability Density Functions or Artificial Neural Networks, to convection scores obtain using both MRR and COSMO model variables and defined and the reference classification.

The paper is of good interest, well written and easy to read. Overall, it carries the required information to understand the arguments developed but, although the methodology approaches are well described, sometimes the paper lacks necessary details and/or preciseness, especially concerning the rationale behind some choices.

Also, it appears that the article has already been through a review process and that the authors have provided a complete and significant response to the expert's comments during this review.

Specific comments:

Convection score section 3.2:

- one could precise that the weighting factors were define to obtain a total score comprised between 0 and 10.
We added the value range information as suggested.
- more importantly, one must argument the choices made for the respective weight of those factors (ranging from 1 to 3) as well as the threshold values (3 and 5.5) chosen to make the classification.
We added an improved argumentation for the choice of the weightings. The choice of the threshold values of 3 and 5.5 is already elucidated in an entire paragraph.

- some discussion or references regarding the defined transition values for each variable would be useful (for example on what base is rain stratiform for $\sigma_{VD,max}$ below 0.8 and convective above 1.2 ?)
These values were determined empirically. We added a description to the text as suggested.
- P5, L 18: give an estimate of the number (or relative number in %) of inspected cases for verification of the classification effectiveness
The relative number amounts to about 10%. We added the information as suggested.

ANN section 3.4:

- One could have expected some further discussion about the network architecture was it predefined through *Tensor-Flow* or did you have options of number of layers and number of nodes, and if so, how did define the network used.
We added further explanations as suggested.
- P 10, L 7 and 12: reading those two passages set some confusion on the actual node output in the process: a value between 0 and 1, or values of -1, 0, or 1. May be the text could make the understanding easier
We added two new sentences to clarify the confusion.

Conclusions

- P 13, L 4: reminding here the arguments leading to this assertion (i.e. “outperforms”) would be useful to confirm this point
We rephrased this sentence.

Conclusions:

This paper introduces a comparison of two interesting approaches for self-standing MRR classification of rain between convective and stratiform. It is well written and easy to follow hence it should make a nice contribution and find good use in the community. Nonetheless, I believe that some arguments would benefit from more extensive justification and/or description of the rationale behind some set choices.

Thus, it is my recommendation that the paper be published after accounting for the requested minor revisions outlined.