

Interactive comment on “Detecting the Melting Layer with a Micro Rain Radar Using a Neural Network Approach” by Maren Brast and Piet Markmann

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To the general comments:

While we find a comparison to other methods interesting, we consider this to be outside the scope of this work. A comprehensive comparison to other methods would need to incorporate some measurement of the melting layer height from an independent source at a similar height and time resolution which we do not have available for our datasets. In addition to this, any comparison would also suffer from ambiguity of choice of other algorithm.

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We have shown comparisons to other methods of determining the melting layer and show cases that traditional decision tree algorithms that incorporate some kind of consensus step will fail to analyze.

To the specific comments:

Numbers 1 and 2 will be corrected.

3. we do not claim that the MRR can identify supercooled rain. Page 2 Lines 21-22 does not refer to this. The text on Page 17 line 5-6 will be clarified.

4. The process of identifying the ML by eye will be explained in more detail. Using several variables while determining the ML by eye reduces the uncertainty involved in the process. In training the NN, it became clear that the quality does not increase by using more variables. This is plausible because some of the other variables are just derivatives of the reflectivity and fall velocity, which means they do not include any new information.

5. Yes, the vertical resolution of the C band radar over the MRR is around 700m for the closest radar and around 1500m for the farthest radar. However, since the model data from comso-d2 are also included in the algorithm and its vertical resolution is much higher, we do not feel that this information is important to mention. We added mentioning the model data in the description of the figure.

6. We added the temperature profile from Greifswald at 12 UTC. At 12 UTC, the temperature at the surface in Hamburg is about 1°C higher than in Greifswald (data from data climate center from DWD). The two locations are about 100km apart. Therefore, we do not expect the two melting layers to occur at the same time.

7. Axis labels will be changed.

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