

Review of the revised version of the following manuscript

Title: Combining commercial microwave links and weather radar for classification of dry snow and rainfall

Author(s): Erlend Øydvin et al.

MS No.: egusphere-2024-2625

MS type: Research article

I would like to thank the authors who did a considerable extra effort to reply to the reviewers comments. The new data classification strategy is straightforward and results are presented now in a more clear form.

However, I think some (small) work is still needed.

Major point 1 has been properly addressed.

Major point 2 has been properly addressed after the authors moved to the hourly integration time scale.

Major point 3: I think it has been addressed. I have only an editorial comment on Fig. 7 (same for Fig. 2): I think it would better to use a different colormap on Fig. 7b and Fig. 7c, because it's not easy to distinguish between small and high fractions. For instance, using 5 distinguishable tones of red for snow and of blue for rain (0-20, 20-40, 40-60, 60-80 and 80-100) would help in better understanding your statement on lines 259-260: "Additionally, for events where the CML estimates more rainfall 260 (negative bias), there are more rainy hours as observed by the disdrometer."

Major point 4: I do not completely agree with the authors' reply on 4a. It makes sense to feed the RT method with ERA5 re-analysis data and indeed I didn't ask the authors to feed the RT method with ground data. I think it would be useful to check ERA5 against some available ground data. The authors discuss in depth about possible errors of disdrometer but do not talk about possible errors in Td estimates.

Comments on the new version:

- Fig. 6 c) deserves an explanation. Why CR method detects a lot of snow events with Td well above 0°C (there is a peak around 8-9° C!). This is an important fact spotted on lines 250-251 and quantified in Figure 9f). However, there is only a short comment on lines 324-326 later on in the discussion. Is this really an algorithmic problem, as the authors suggest (hence, it is anything that can be mitigated) or, rather, is it due to an inner limitation of CML sensors, i.e. a limited sensitivity due to length-frequency characteristics + signal quantization? Unfortunately, there is not an analysis divided by rainfall intensity class, which I think would help in understanding. At least, please add this possible explanation related to a limited sensitivity to the CML.
- Fig. 2 caption: what do the author mean by "(distorted) positions of the CMLs" ?
- Lines 230-236 the description of what's happening around 18:00 does not fit Fig. 3 ("Around 18:00, the CR method, RT method, and disdrometer all estimate rainfall")

Conclusions/1: Just counting the misclassified samples on Fig. 9 (i.e. non-diagonal elements of the matrices), for $T_d \geq 2^\circ\text{C}$ I see roughly 35k misclassified hours by RT and 39k by CR, while if $T_d \leq -2^\circ\text{C}$ we have 30k against 32k respectively and if $|T_d| \leq 2^\circ\text{C}$ we have 22k against 21k. Either method has its own strengths and weaknesses, which brings to the next bullet.

- Conclusions/2: I would like that the authors comment about whether merging RT + CR methods would be beneficial. Maybe yes, because, for instance, Td info would dump to zero all that huge CR misclassification of dry/rain as snow at large positive Td values, which is the minus of CR.