

Journal: AMT

Title: Close-range radar rainfall estimation and error analysis

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The paper describes a case study in the Netherlands where weather radar and disdrometer acquisitions are compared each other in a configuration where vertical variability of DSD as well as path attenuation can be considered negligible.

The final goal is to put evidence (and quantify) on two aspects:

1. Quality in the procedures for the radar signal processing (ground clutter removal, wet radome loss compensation, absolute calibration of the reflectivity factor).
2. Temporal variability of DSD.

The paper reads very well and although the conclusions of the manuscript are not surprisingly new the presentation is good and arguments are convincing me. Using the right level of complexity the Authors quantify the impact of the various radar processing steps to better mimic the evolution of rain accumulations registered by the nearest rain gauge.

I recommend for publication after minor revision.

Comments/suggestions

- I am expecting a positive impact of an event based Z-R in absence of VPR effects. In the presence of VPR effects we have a problem of representativeness of the Z-R relationships aloft with respect to those at the ground.

Do you have the chance to check at the temporal variation of the VPR at the considered site (i.e. using the rest of the radar antenna elevations) to produce errors, which would be representative of the non-optimal configuration (i.e. when observing rain precipitation at some distance above the ground)? In other words what happens considering Z at different elevations?

- pag. 1. line 4. Abstract . : "5) vertical profile of reflectivity" more in general I would say vertical variability of DSD. Not only the reflectivity is affected by the vertical variations, although in this paper only the reflectivity is used.

- pag 2, line 5 On the NUBF I would cite

ALEXANDER V. RYZHKOV, The Impact of Beam Broadening on the Quality of Radar Polarimetric Data, JOURNAL OF ATMOSPHERIC AND OCEANIC TECHNOLOGY MAY 2007

After, at line 33 of the same page, I would explain more which are the effects of NUBF on Z (reduction?). Have you checked NUBF effects for the considered case of study. Is the spectral width available for the considered event? Please explain.

- pag 6, line 30. Reading this sentence it seems that you have not considered the effects of the calibration, ground clutter and wet radome as well. This is not the case of course. I think the phrase need to me modified.

- pag 8. It would be useful to show the map of the clutter map cited in the text.

-pag 9. line 4. "Subtraction of the mean value of Z (i.e. not in dBZ)". I would expect a subtraction in dBZ, which implies a division in linear units. Am I wrong?

- pag. 12 figure 9. Could you please a different color for the black curve?

- pag 12. eq. 2. How is calculated σ_B in your equation? Please explain in the main texts.