

***Interactive comment on* “Uncertainties in rainfall retrievals from ground-based weather radar: overview, case study, and simulation experiment” by R. Uijlenhoet et al.**

Anonymous Referee #1

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I was very excited when I saw the title of the paper and was looking forward to reading it. When I finally found time to read it, my excitement turned into disappointment. There are three parts in the paper (as the title indicates): an overview, a case study, and a simulation experiment. All are supposed to be connected under the umbrella of discussing uncertainties in ground-based weather radar estimation of rainfall. While one certainly could argue that there is a connection between the three elements, I argue that it is somewhat artificial. One would expect that both the case study and the simulation should address a gap in our understanding identified in the overview. This is barely the case. The case study illustrates with real data that indeed there are range-

dependent uncertainties in radar-rainfall estimation. Hardly a new development. The simulation study, perhaps the most solid element of the three, focuses on correcting for attenuation at three different radar bands. Still, even this element is not the most relevant as there is a clear technological trend towards using polarimetric radars. Such radars are capable of measuring additional parameters such as differential phase shift and attenuation correction can be accomplished in a more effective way than using reflectivity only.

The overview of the rainfall measurement problem has been covered by the authors in an overly general way. Who is a target audience of this overview? Experts in rainfall measurements? I don't think so. There is nothing new they can learn from the discussion. The non-experts (fellow hydrologists who specialize in other than rainfall processes and newcomers to the field)? For such audience the exposition of the problem is simply too brief and not lucid enough. The authors "jump" from subject to subject in a seemingly random fashion. For example, what is the purpose of discussing (listing, really) the space-time rainfall models in the section titled "The rain gauge era." The authors make "big" statements very critical of the past efforts (end of section 2.2) but offer nothing (or little) of their own to address the problems they mention. Also, the authors seem to be unaware of many studies published in the literature in the last decade on the subject. I find amusing the definition of "radar hydrology" the authors offer. While I fully agree with the authors that "radar calibration" using rain gauge is a misnomer, I do not agree that the way rain gauge data are used in conjunction with radar data defines the field of radar hydrology. As numerous conference on radar hydrology illustrate, any application of radar data in hydrology belongs to the field of radar hydrology.

The range effect case study is interesting but hardly presents a new finding as the problem has been well acknowledged in the literature for at least 15 years and demonstrated in several studies. Here too the authors seem to be unaware of the literature.

The simulation study of the attenuation correction methods is interesting although, since it is based on simulation and not corroborated by empirical support, it could eas-

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ily be subjected to the usual criticism of the underlying model assumption. However, a more significant issue is that of relevance. The study would be much more relevant if it included polarimetric variables. As polarimetric radar (S-band, C-band, and X-band) technology enters widespread use, providing such context to the study would be more useful to the readership of the journal.

In summary, in my view experts on the subject of radar hydrology can skip reading this paper with little loss while novice readers can learn more elsewhere.

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