

Atmos. Meas. Tech. Discuss., referee comment RC2
<https://doi.org/10.5194/amt-2022-83-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on amt-2022-83

Anonymous Referee #2

Referee comment on "Automatic quality control of telemetric rain gauge data providing quantitative quality information (RainGaugeQC)" by Katarzyna Ośródkka et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-83-RC2>, 2022

This manuscript describes a real-time quality control procedure for a rain gauge network. This task is very difficult and important because the rain gauge data serve as the "ground reference" for scanning radar and satellite rainfall retrieval algorithms.

This work is appropriate for the Journal of Atmospheric Measurement Techniques (AMT). The manuscript provides enough information on the method that an AMT reader could repeat the method on a different rain gauge network.

Below are a few suggestions that could help clarify a few confusing sentences in the manuscript. I look forward to seeing the manuscript after the AMT discussion period.

Suggestions (in line order)

- Line 63. Please expand with a half-sentence on how the concept of seeder-feeder is related to under- or over-estimation of surface rain fall amount, or how the seeder-feeder process causes a lag of surface precipitation relative to the radar observing enhanced precipitation aloft. This reviewer is not familiar with how the seeder-feeder ice cloud process impacts surface rain accumulations. Thus, I believe an AMT reader would be interested in what information the authors want to share.
- Line 112-124. Make these three paragraphs one paragraph because the phrase "The latter approach..." should refer to an approach that is in the same paragraph. Also, the first two paragraphs are one sentence each.
- Line 137. Does the phrase "lower-level" refer to lower-altitude stations, or lower-quality (less reliable) stations? Please clarify.
- Lines 150-151. The sentence starting with "Both gauges..." is confusing. Should the sentence read: 'Both stations are equipped with heated and unheated sensors'? Please clarify.

- Line 156. The first sentence is confusing to me. Should the sentence be something like, '...corresponds to well-functioning rain gauges, and the right graph corresponds to one or both rain gauges not functioning correctly.' Please clarify.
- Line 220. Can you calculate the corresponding radar reflectivity factor needed with the MP Z-R relationship to get 56 mm/10 min rain rate? That would be an interesting comparison for radar-centric AMT readers.
- Section 4.3. This is a good example of how the proposed method identifies a large rain gauge data value and lowers the QI score. As a visual of how the algorithms identify this outlier and reduces the QI score, can a time-series plot be included in Fig. 8 of rain rates from neighboring gauges and radar estimates over the Nowa Wies Podgorna site for the 12 samples before and a few samples after the outlier event? Also, this time-series plot can be used to remind the AMT reader that the time-series analysis is only looking backward in time to produce a real-time QC'd product.
- Lines 375 and 395. The rainRGS and NWC-SAF datasets need to be introduced in Section 2, which describes the datasets that are used in the study.
- The appendices are well written and describe the algorithms with sufficient detail that I think this reviewer and AMT readers could repeat the algorithm with their own rain gauge network. The conclusions properly state that every network needs to be calibrated to determine their own thresholds. To help promote the algorithm, can flow diagrams be provided showing the if-then-else flow of the algorithms? I am thinking big-picture diagrams with the text providing the details. (I assume the authors already have these diagrams for their conference slide-deck oral presentations.)