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Interactive comment on "An improved post-processing technique for automatic precipitation gauge time series" *by* A. Ross et al.

Anonymous Referee #1

Received and published: 14 January 2020

Post-processing is essential to the automated accumulating precipitation gauges, although it is just a filtering technique. This study proposed an improved post-processing technique to tackle the noise caused by diurnal oscillations and drift from the evaporation of the bucket contents. Comparing with other techniques, the major advantage of the suggested one is its fully-automated processing with a 24-hour latency. Generally, this study is well written and presented. I am happy to see this paper published in the Atmospheric Measurement Techniques. But the following issues should be addressed properly before the paper can be considered for publication.

1. For users, people would like to know what are the performances of the filter for all-weather precipitation. Compared to a much smaller amount of solid precipitation in the cold season, testing the filter might be more important in the warm season. First of all,

the drift from evaporation in the warm season can be much more serious in most cold regions, and the evaporation rate can be much larger. Secondly, the noise features can be quite different between warm and cold seasons. Thus, to make the conclusion more solid for both rainfall and solid precipitation, I would like to see the performance for the warm season.

2. Compared to the robustness of NAF-S, the validity of NAF-SEG is closely related to the setting of the minimum threshold P* = 0.001 mm. Although the authors assert it is somewhat arbitrary within the tested conditions of solid precipitation measurements, it might be challenging for the noise features in the warm season. Considering the more variability of precipitation and stronger evaporation in the warm season, further exploration in the point is necessary. In addition, there is no validation for the raw precipitation data when using the filters. Therefore, validation using independent measurements from the tipping bucket would be very helpful for the filtered measurements from the accumulating gauges.

3. As we know the performances of the filters are slightly related to the climate of the observed sites. Further discussion of the relationships between the biases for the 44 raw time series would help understand the validity of the filters in different environments.

Mineral comments: (1) P1-L5: If my understanding is correction, this study is talking about the weight-based precipitation gauge. It is quite confusing when using 'automatic precipitation gauge', 'automated accumulating precipitation gauge' and 'automated accumulating (weighting) precipitation gauge'. (2) P12-L406: 'his' to 'this'.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-423, 2019.