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Comment on amt-2021-365

Anonymous Referee #3

Referee comment on "Evaluation of aerosol microphysical, optical and radiative properties measured with a multiwavelength photometer" by Yu Zheng et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-365-RC3>, 2021

A new multispectral photometer for monitoring aerosol microphysical, optical, and radiative properties

By Zheng et al.

General comments:

Atmospheric aerosols have significant influence on regional air quality, regional climate change, as well as human health. Their loadings have been increased substantially compared with those in Pre-industrial times. A detailed description on the aerosol optical and physical properties is the prerequisites for better evaluating the effects of the aerosols. Unfortunately, uncertainties of the aerosol radiative forcing and climate effects still exist due to a lack of knowledge about the aerosol properties. Therefore, a new highly integrated observation instrument is necessary to be developed to fill the gap of current observation system. This study proposes a new multispectral photometer (CW193) with a highly integrated designing and smart control performance for monitoring aerosol microphysical, optical, and radiative properties. The results indicate that CW193 can well observe and capture the aerosol characteristics by comparing with AERONET products, implying that the instrument may have a wide application prospect in the further. The topic of this study is interesting and novel. Therefore, the paper has a potential for publication in the journal.

Specific comments:

- Why the new instrument is named as CW193? The authors can make a detailed introduction.
- What is the main difference (or progressiveness) of the CW193 against to the CE-318?
- How many observation intervals can be set for CW193?
- The authors state that CW193 has a low maintenance requirement. How long and in what conditions does it need to be taken to maintain? I think all the ground-based instruments are needed to have a routine maintenance.
- To make the instrument more reliable, more observation and validation works should be carried out in the further. For example, the authors can perform a series observation activities with different pollution levels, in different time scales, in different regions as well as in different seasons.
- Conclusion should be more refined instead of repeating the results. An additional discussion on the potential application of the instrument in the future can be involved in this section.
- English should be corrected throughout the whole manuscript.