Comment on amt-2021-365

Anonymous Referee #2

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-RC2, 2021

This paper presents a newly-designed sun photometer for aerosol retrieval. Compared to the widely used CE318 model, the new instrument has the advantage of better portability with similar accuracy. Inter-comparisons are carried out to evaluate the performance, which shows that the CW193 sunphotometer has comparable retrieval accuracy. The new instrument has the potential to be deployed in remote and desert regions, thus expanding the aerosol observation network. Overall, this is a well written paper with good scientific merit. I only have a few minor questions.

Minor comments:

1. The design of CW193 is very similar to that of CE318. The authors indicated that the biggest advantage is CW193's portability. I suggest providing more detailed discription about this. In Figure 2, only the optial head part is shown, or is this the whole system? If latter, I suggest making it clear as this indeed appears much more compact than CE318.

2. Does the retrieval of aerosol optial properties use the same inversion method as AERONET? Please briefly describe the retrieval method.

3. In addition to comparing with AERONET and CARSNET, I think it is also very important to independant evaluate the measurement and retrieval accuracies of CW193. How accuray are the sky and diffuse radiances? How are the errors in these measurements transferred to the retrieved products? Are these accuracy levels comparable, or better than AERONET?

4. Could the authors provide some explanations of the differences between CW193 and

AERONET/CARSNET? Based on Figures 7-11, there are still some biases and differences.