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Atmospheric Measurement Techniques Discussions

Interactive comment on "LOAC: a small aerosol optical counter/sizer for ground-based and balloon measurements of the size distribution and nature of atmospheric particles – Part 2: First results from balloon and unmanned aerial vehicle flights" *by* J.-B. Renard et al.

Anonymous Referee #2

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General Comments :

This paper presents the applications of the developed LOAC under different platforms (UAV and a variety of scientific balloons) for the measurements and characterization of particle size distributions, which is within the scope of AMT. The measurements of the vertical profile of particle size, concentrations and speciation of atmospheric aerosols are very important. However, the accuracy and the significance of the reported LOAC

depending on the critical assessment of the instrument performance presented in the companion paper (part 1). In this paper (part 2), there are too many figures. A lot of figures are very much the same. For the demonstration of the ability of the application of LOAC, one or two flights described in detail is enough, except there are new findings. The discussions of the experiment results or data processing methods are not enough, which made the paper a little weak in the sense of scientific research. Further improvement is still needed.

Specific Comments :

1, The "Introduction" Section would benefit from more discussion of the scientific background and the recent progress in the vertical profile measurement of aerosol size distribution ? What is the motivation of the development and application of LOAC ? What about the advantages and disadvantages of LOAC compared with other instruments ?

2, Line 113, is there any consideration of the sampling loss of the LOAC ?

3, Line 135, what is the value of the pressure inside the cavity ? The pumping system works in extreme condition as at ground, however, the atmospheric pressure is different up to an altitude of 34 km. Is there any correction for the pressure change of the LOAC ? The stability of the pumping system was about $\pm$5%, what are the corresponding errors of particle number and concentration measurement ?

4, Line 146, a large number of LOAC flights under different kinds of platform, but no intercomparison of the vertical profiles with other commercial or well developed instruments is shown. How to make sure that the measurement result is correct ?

5, Line 186, the data processing method used for speciation analysis is missed, which is very important for the data quality assessment.

6, Line 277, the daytime average aerosol optical depth at 550 nm is shown in Fig. 12. More discussions or explanations are needed here ?

7, Line 343, the Section "4 Discussion" would benefit from more considerations of

following questions : (1) The influence of the atmospheric pressure and RH ? (2) The validation of the ground calibration for high altitude platforms ? (3) Data quality control.

8, Line 586, Fig. 3, a three dimension figure or image graphs will be helpful to the understanding of the results.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 1261, 2015.