

Interactive comment on “Development of a cavity enhanced aerosol albedometer” by W. Zhao et al.

Anonymous Referee #1

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This manuscript presents excellent work showing substantial progress from previously published work. It should be published in AMT after minor revision taking the following comments into account.

1) The discussion of the influence of particle losses on instrument performance is insufficient. Note that most particle loss mechanisms are size dependent and that the particle SSA is often also size dependent. Therefore, the statement on page 2994, lines 5-7 “Since the scattering and extinction coefficients were measured on the exact same volume, the uncertainty [of SSA] due to particle losses could be ignored.”. For example should the atmosphere contain a bimodal size distribution of sub-micron black carbon particles (low SSA) and supermicron mineral dust particles (high SSA) with supermicron particles experience large inlet losses due to gravitational settling and/or impactions, the SSA measured could be much smaller than the ambient SSA.

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Therefore, a particle size dependent discussion of particle losses is of the essence.

2) A discussion of the time response of the instrument is missing. The time response is likely to be limited by the time needed to exchange the sample volume inside of the instrument. Such a discussion is important to be able to evaluate potential use of the instrument for characterizing particle optics in quickly varying environments.

3) P. 2983, lines 9-12: “ the commonly used method for the measurement of SSA is to separately measure the aerosol scattering, absorption, and extinction coefficients with different instruments.”. Commonly, only two of these three coefficients are measured to determine SSA and this should be stated here.

4) The English language is much improved from the initial submission but there are still some minor issues such as p. 2999, line 8 which should read “controllers are usually used”, instead of “controllers is usually used”. Additional proof reading is recommended.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 2981, 2014.