

General comments

This a thorough calibration study of two frequently used types of OPC that is well worth publishing. As it highly instrumental I wonder if it would better into a more technical journal. After suitable response to my comments below I would recommend publication.

Specific comments and technical corrections

Change all “submicron” and “supermicron” to sub-micrometer and super-micrometer, respectively.

Page/line	Comment
7/27	Obscure sentence
9	There is no need to go into the details of the DMA technique here. The DMA has been used extensively before to calibrate OPCs, e.g. Covert, D. S., Heintzenberg, J. and Hansson, H.-C.: Electro-optical detection of external mixtures in aerosols. <i>Aerosol Sci. Technol.</i> 12, 446-456, 1990; Covert, D. S. and Heintzenberg, J.: Size distributions and chemical properties of aerosols at Ny-Ålesund, Svalbard. <i>Atmos. Environ.</i> 27A, 2989-2997, 1993; Okada, K. and Heintzenberg, J.: Size distribution, state of mixture and morphology of urban aerosol particles at given electrical mobilities. <i>J. Aerosol Sci.</i> 34, 1539-1551, 2003.
10/25	Where do the numerical values of the weighing function w come from?
11/13	What are the many references meant to substantiate here?
12/2	How do you justify the choice of a Gaussian function, which is not self-evident to me, in particular at the lower end of the size-sensitivity curve of an OPC where the sensitivity varies considerably with particle diameter?
17/8	Dealing with the multiply charged fraction of calibration particles downstream a DMA is not quite as trivial as presented here. Only if an OPC can clearly separate singlets and multiplets (which I'd like to see for the present study, the doublets in Fig. 5 are not connected to any individual singlet) they can be corrected for. This correction only works if the size-sensitivity of the OPC is the same for both, the singlets and the multiplets, which not necessary is the case in particular at range boundaries.
19/20	This approach had been used several times before (cf. references above)
23/4	The “complex” method does not relieve the OPC user from diameter uncertainties in the case of unknown refractive index, particle homogeneity, shape and orientation.