

Interactive comment on “Concept for an electrostatic focusing device for continuous ambient pressure aerosol concentration” by Joseph L. Woo et al.

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Received and published: 3 April 2019

We thank the reviewer for their comments. We also thank them for bringing the recently published Saarikoski et al. (2019) to our attention. We will be sure to cite that work in the revised manuscript.

My primary concern is that these only one test experimental data is not sufficient to conclude that concept can actually be used for general aerosol studies where enhancement is necessary for aerosol detection. One cannot reach the conclusions that enhancement is possible with just one test experiment.

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Discussion paper



Perhaps this was not sufficiently clear from the Discussion Paper, but the apparatus was tested in multiple test experiments for a range of operating conditions. Test experiments were performed to quantify aerosol concentration enrichment for a range of applied voltages and particle sizes. The observed enrichment achieved by our electrostatic focuser, encompassing multiple replicates of a total of fifteen operating conditions, is summarized in Figure 6. We will edit the manuscript to ensure that this point is clear in the final version.

The presented concept needs to be tested using different aerosol systems, and validation should be confirmed from understanding size-distribution and chemical composition of aerosol (minor flow output).

Monodisperse aerosol at different selected particles sizes (via size selection through a DMA, see Figure 6) was used to demonstrate effective concentration as a function of particle size, in more a precise manner than would have been achieved using polydisperse aerosol. Our focus is on organic aerosol, as discussed in the introduction, and homogeneously nucleated stearic acid was chosen as a representative aerosol type. We don't expect electrostatic focusing of other organic aerosol types to vary significantly from stearic acid aerosol. Chemical composition of the minor flow output, as measured via Aerosol-CIMS, was pure stearic acid, as expected (cf. page 5, lines 26-28 and page 6, lines 14-16 "No additional signal peaks beyond those of stearic acid were observed in Aerosol-CIMS during operation regardless of applied voltage, implying that stearic acid did not undergo any chemical reactions as a result of the charging process or from exposure to the electric field of the electrostatic focuser").

In response to the reviewer comment we will revise the manuscript to further emphasize our focus on organic aerosol in the introduction, and to clarify the design of our text experiments at the beginning of section 4.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-43, 2019.

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