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Reply on RC1

Stavros Amanatidis et al.

Author comment on "Efficacy of a portable, moderate-resolution, fast-scanning differential mobility analyzer for ambient aerosol size distribution measurements" by Stavros Amanatidis et al., Atmos. Meas. Tech. Discuss.,
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The authors would like to thank the reviewer for their constructive feedback on this paper. Our point-to-point response to the reviewer's comments is listed below.

1) Indeed, the low flow requirements of the Spider DMA enable the usage of more compact and low-power pumps. While there are more than one options that would be appropriate for the Spider sheath flow, we included in the "Methods/Experimental" subsection of the revised manuscript a brief description of the pump used in this prototype system, which is an in-house prototype pump based on a low-power piezoelectric micro-blower. The pump assembly weight is ~ 60 g.

2) We used a prototype soft X-ray charge conditioner that was developed recently at Caltech. It is based upon a Hamamatsu soft X-ray source. Detailed calibration of the charger was stopped by the COVID-19 shutdown, and further delayed when it was deployed to make the measurements reported in this paper. Details of the charger design and a full calibration will be reported in a separate paper. As noted by Steiner and Reischl (2012), and Leppä et al. (2017), the charge distribution depends upon trace gases in the aerosol sample and may differ from the results of those earlier simulations. We agree with the reviewer that this is critical information for electrical mobility measurements of particle size distributions, but, since both instruments sampled the aerosol from the same charge conditioner, the conclusions drawn from the comparison presented in this paper are not affected. This note was included in Section 2.5 of the revised manuscript.

3) We revised this paragraph to the following: "*The Wiedensohler (1988) fit to the Hoppel and Frick (1986) numerical evaluation of the Fuchs (1963) charge distribution has been used in the data inversion. Note that, since both instruments sampled from the same soft X-ray charge conditioner, any deviations from the assumed charge distribution will not affect the comparison between the two instruments.*"