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Atmospheric Measurement Techniques Discussions

Interactive comment on "ACTRIS ACSM intercomparison – Part I: Reproducibility of concentration and fragment results from 13 individual Quadrupole Aerosol Chemical Speciation Monitors (Q-ACSM) and consistency with Time-of-Flight ACSM (ToF-ACSM), High Resolution ToF Aerosol Mass Spectrometer (HR-ToF-AMS) and other co-located instruments" *by* V. Crenn et al.

Anonymous Referee #1

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The manuscript by Crenn et al. conducted a comprehensive evaluation of aerosol

chemical speciation monitor that has been widely used in the field to measure aerosol particle composition. This is a very important paper for the community to know the uncertainties of ACSM. This inter-comparison experiment demonstrated the high reproducibility and robustness of ACSM for measuring different aerosol species, and also highlighted the uncertainties. Particularly important, this study pointed out the large uncertainties of f44 from ACSM measurements, reminding the community that using f44 for estimation of the aging parameter (O/C) should be very cautious. This manuscript is well written and fits the scope of AMT. I recommend it for publication after addressing the following comments.

1. The title is too long and not good for readers to catch the point.

2. Page 7259, the second paragraph, it's not necessary to show the number of ACSM, e.g., ACSM # 3, when describing the range of the values. If use, "ACSM" and "Q-ACSM" need to be consistent.

3. This manuscript didn't discuss much about relative ion transmission efficiency, which might vary significantly between different instruments. Have the authors checked the fitting curves of ion transmission efficiency between m/z 50 – 150 for different ACSMs. Would it be an important factor contributing to the measuring uncertainties?

4. With nitrate, sulfate, and ammonium measurements, aerosol particle acidity can be estimated. I suggest the authors adding some discussions on the uncertainties in estimating particle acidity using ACSM data, which is an important parameter widely used in the AMS community.

5. Fig. 11, PIL-IC should be PILS-IC.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 7239, 2015.