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Atmospheric Chemistry and Physics Discussions

Interactive comment on "An assessment of the performance of the Monitor for AeRosols and GAses in ambient air (MARGA): a semi-continuous method for soluble compounds" *by* I. C. Rumsey et al.

Anonymous Referee #2

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Comment on a manuscript titled "An assessment of the performance of the Monitor for AeRosols and Gases in ambient air (MARGA): a semi-continuous method for soluble compounds" by Rumsey et al.

General Comments The present manuscript provides a detailed assessment of the of a MARGA instrument for supplementing CASTNet monitoring capability to characterize atmospheric chemistry and deposition of nitrogen and sulfur compounds at higher time resolution than filter pack. The assessment focused on the comparison between MAR-

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GAR and filter pack method on gaseous SO2, HNO3 and NH3 and aerosol SO42-, NO3-and NH4+. In general, the manuscript is well written with logical flow of information. The key findings from the present assessment should contribute significantly to the development of routine instruments for the monitoring of important parameters that are critical for the understanding of atmospheric processes, long-term air quality trends, and evidence-base policy formulation. Nevertheless, the limitation in scope of the assessment, including the limited study period (from 8 September-8 October 2010), limited and low concentration ranges of monitored soluble ions during the monitoring period, tests conducted in only one site, should also be highlighted.

Specific Comments

1. RE: sampling site and scheme (lines 15 to 20, page 25072), it would help the readers to get a sense of the nature and characteristics of the AIRS site by providing a location map. 2. Lines 20-21, page 25072, "...The horizontal distance between the MU inlets and the denuder/filter packs was less than 2 m."... Exactly what was the distance between the MU inlets and the denuder/filter packs? Any potential interference as a result of the sample inlets being too close? 3. Lines 8-9, page 25073; line 5, page 25075, I don't understand why an inlet with aerodynamic particle cutoff of 26 um was fitted with the MARGA system while the filter pack system was fitted with a particle size cutoff of 2.5 um. Any scientific or operational reasons behind this arrangement? More elaboration, clarification, and justification are needed. 4. Lines 1 to 19, page 25075 under denuder/filter pack system, any idea about the collection efficiency of the denuder/filter pack system? Any spiking or evaluation perform on this system before? 5. Lines 22 to 24, page 25082; Lines 8-9, page 25073; line 5, page 25075, ...As mentioned in Sec 2.2, the filter pack had a particle size cut-off of 2.5 um aerodynamic diameter, whereas the MARGA customized inlet had a cut-off of 6 um."... This is very confusing. Was the MARGA unite fitted with a 26 um inlet or 6 um inlet should be clarified. Hope this is not just a typo error. 6. Line 5, page 25088. '...Because of the larger particle cut-off (-26 ug) used in the present study...' 26 ug should read 26 um.

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7. Line 25, page 25093, How would the proposed “bacterial consumption event” be handled in routine monitoring operation and data processing work? Bearing in mind that the present study was performed by a team of experts comprising personnel from USEPA and Metrohm Applikon. 8. Unit missing in Y-axis in Fig 7. 9. Typo: Line 13, page 25069, SO4- should read SO4 2-

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 25067, 2013.