**Atmospheric
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Discussions

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Interactive comment on "Identification of humic-like substances (HULIS) in oxygenated organic aerosols using NMR and AMS factor analyses and liquid chromatographic techniques" by M. Paglione et al.

Anonymous Referee #2

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General comments:

In this work, the authors have presented an improvement for interpreting organic aerosol components by combing two complementary methods, AMS and NMR spectroscopy, which allow them to draw further insight from ambient measurements. Typically, factor analysis is limited to one type of measurement (AMS); this approach likely leaves some components unresolved and results in a biased view of the aerosol population. To improve upon this, the authors have collected filters and used NMR spec-

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troscopy, coupled with factor analysis, so see what differences may exist in the two data sets.

The manuscript is clear, concise, and well written. The results are presented in a direct fashion and are accompanied by a sufficient level of interpretation. The figures are clear and the tables are easy to follow. I have only minor comments and I recommend this paper for publication with only a few small changes.

Specific comments

Pg 17215 line 16-17: The authors mention that Factor 2 looks like HULIS or humid acid, but that the conditions were dry during the secondary processes leading to the formation of factor 2 organics. I feel like there is more to say here, perhaps another thought? It wasn't clear why it was interesting that the conditions were dry. Perhaps the authors are suggesting that the secondary processes were gas phase and not aqueous?

Pg 17216 line 17: When using PMF on AMS data, there is some precedent for down-scaling the importance of m/z 44 (Ulbrich et al., 2009, Section 2.3.1) by increasing the error associated with m/z 44, m/z 18, m/z 17, and m/z 16. This help with the author's observation that factor spectra are predominately controlled by a few m/z peaks.

Pg 17220 line 8: the authors sometimes use R for Pearson's correlation and sometimes R^2. It would be more helpful to keep one metric for consistency.

Pg 17221 lines 11-23: While it's true that the two techniques are uniquely sensitive to certain functional groups, it's worth noting the the time resolution of the two measurements likely also plays a role in the outcome of the factor analysis, and in the sources they are able to recognize and separate.

Pg 17223 point (c) in the last paragraph: this point is really hard to follow. Please reword this. I am not sure even what the main conclusion is for this point, but it sounds important.

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Figure 7: are the linear regression fits done as a least-squares in the y variable or a total least squares? The fit may change in total least squares, which would be the correct regression if the authors believe both metrics have approximately equal uncertainty.

Technical corrections

Pg 17202 line 21: pluralize "need" to "needs"

Pg 17213 line 7: replace "worth to mention" with "worth mention" or "worth mentioning"

Pg 17215 line 27: change "urbanizes" to "urbanized"

Pg 17216 line 13: replace "is" with "are"

Pg 17221 line 7: replace "oxigenated" with "oxygenated"

Pg 17225 line 8: replace "ageing" with "aging"

References: Ulbrich, I. M., M. R. Canagaratna, Q. Zhang, D. R. Worsnop, and J. L. Jimenez, Interpretation of organic components from Positive Matrix Factorization of aerosol mass spectrometric data, 2009, Atmos. Chem. Phys., 9, 2891-2918.

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 17197, 2013.