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Interactive comment on “An intercomparison study of analytical methods used for quantification of levoglucosan in ambient aerosol filter samples” by K. E. Yttri et al.

Anonymous Referee #3

Received and published: 20 August 2014

This paper presents the results for an intercomparison study to examine different analytical methods used to measure monosaccharide anhydrides in aerosol samples. Thirteen labs participated in the study. The various techniques used and results of the intercomparison are presented.

Being able to routinely measure levoglucosan and other smoke markers is very important. This is largely due to the fact that it is known that biomass burning is one of the main sources of organic carbon, but its impact is still not well understood. This paper is reviewing and comparing all the current techniques used to measure levoglucosan and other anhydrosugars. Many in the atmospheric community would be interested in

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this paper.

Overall, this is a good paper. Mostly I have minor comments to help with the flow of the paper. However, I do think that the authors could add something in the conclusions to tell readers about the bounds that could be put on the current measurements based on the intercomparison results. This would be especially useful to modelers that often use a variety of levoglucosan measurements to create biomass burning emission inventories. This is outlined in more detail below, along with other specific comments that need to be addressed before this paper can be considered for publication.

Specific Comments: Abstract Page 7399, Line 6 – wild fire should be one word

Page 7400, Line 10 – The chemical abbreviation used is not defined

Page 7400, Line 19 – wild fires should be one word

1. Introduction Page 7401, Line 6 - Suggest removing the the before BB

Page 7402, Line 27 – I believe Gelencser should have accent marks

2. Experimental 2.2. Aerosol filter samples collection, storage, preparation, and shipment Page 7405, Line 4 - Suggest removing the word sector after each

2.4. Quality assurance 2.4.1. Homogeneity of filter samples Page 7406, Line 27 – Suggest changing laboratories). I.e., to laboratories), i.e.,

Page 7407, Line 22 - Suggest adding a the before various

3. Results and discussion 3.1. Levoglucosan Page 7410, Line 7 – Suggest changing if obtained by to assuming and adding an a before flow rate

Page 7410, Line 26 – What does the abbreviation EMEP mean? It is not defined.

3.2. Mannosan Page 7413, Line 1 – Suggest changing if obtained by to assuming

Page 7413, Line 2 – The units used for the flowrate are different than what was presented earlier

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Page 7413, Line 12 – A % is missing after 33

Page 7413, Line 21 – Suggest changing non-existing to non-existent

3.3.Galactosan Page 7414, Line 5 - Suggest changing if obtained by to assuming

Page 7414, Line 6 – The units used for the flowrate are different than what was presented earlier

Page 7415, Line 7 – Suggest changing also when compared to levoglucosan to compared to the other isomers

3.4.Relative contribution of levoglucosan, mannosan, and galactosan to the sum of the three isomeric compounds 3.4.1.Levoglucosan to MA ratio Page 7415, Line 15 - Suggest removing the (Table B3)

3.5.The levoglucosan to mannosan ratio Page 7418, Lines 22-23 - Suggest changing amount of the to contribution of

Page 7418, Line 23 – Suggest adding a the before burning

Page 7419, Line 7 – Suggest changing Beside to Besides

Page 7420, Lines 6-7 – Suggest changing besides MAs also other to in addition to MAs, other

4.Conclusions Page 7420, Line 23 – Suggest adding a the before analysis

Page 7420, Line 15 to Page 7421, Line 5 – I feel the one thing missing from the conclusions is a mention of the bounds that could be put on the current measurements based on the intercomparison results. Basically from these results can we better constrain all the data we have out there already for levoglucosan. This would be especially useful to modelers that often use a variety of levoglucosan measurements to create biomass burning emission inventories.

Appendix A Page 7421, Line 9 - A period is missing after Lab

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Page 7421, Line 11 – Suggest changing de-ionized to deionized

AMTD

Page 7421, Line 23 – Suggest changing eluted to extracted

7, C2284–C2289, 2014

Page 7422, Line 3 – I believe micro centrifugation should be microcentrifuge

Page 7422, Line 9 – A period is missing after Lab

Page 7423, Line 16 – Suggest putting 2 mM in parentheses

Page 7423, Line 19 – Suggest adding a the before mobile

Page 7423, Line 20 – Suggest changing in the selected to using selected and changing Na to sodium

Page 7423, Line 22 – Suggest changing that for 13C6-levoglucosan was to for 13C6-levoglucosan it was

Page 7427, Line 9 - Suggest changing were added to was added and removing the from before bacteria

Page 7427, Line 16 – Should m/z 113 be m/z 110?

Page 7425, Line 7 - Suggest adding an an before internal

Page 7425, Line 8 – Suggest adding an an before 8 ml

Page 7425, Line 9 – Suggest adding an an before ultrasonic

Page 7425, Line 18 – Suggest adding an an before internal

Page 7425, Line 19 – Suggest putting 2H7-levoglucosan in parentheses

Page 7425, Line 20 – What is the each referring to? Should it be removed?

Page 7425, Line 23 – Suggest changing was added to were added

Page 7426, Line 2 – Suggest adding an a before recovery

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Page 7426, Line 8 – Suggest adding an an before internal
Page 7426, Line 18 – Suggest adding an a before levoglucosan
Page 7426, Line 21 – Should it be time-of-flight?
Page 7426, Line 26 – Suggest adding a there after kept
Page 7427, Line 11 – Suggest adding an a before 1,4-dithioerythritol
Page 7427, Line 13 – Suggest adding a was before reacted
Page 7427, Line 19 – Suggest adding an an before authentic
References Page 7428, Line 15 - I believe Gelencser should have accent marks
Page 7429, Line 19 - There is a comma missing after Malm, W.C.
Page 7430, Line 23 - I believe Gelencser should have accent marks
Page 7432, Line 15 – I believe Moosmuller should have accent marks
Page 7433, Line 31 - I believe Gelencser should have accent marks
Page 7436, Line 4 - I believe Prevot should have accent marks
Tables Table 1 -In footnote under Table, I believe it should be 12 cm²
Table B1 -Many chemical abbreviations are used here, suggest adding a reference to Table C1 which provides a list of all abbreviation used in the text
Figures -For Figures 2 through 8 commas are used in the place of decimal points. Although this is fine, decimal points are used throughout the text. It would probably be better to stay consistent and use the same format throughout the entire paper. Also in the list of analytical methods used to the right of each figure, the 2 in H₂O is not subscripted.
Figure 5 Line 5 of caption – Suggest adding the word extraction after used for

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