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Discussions

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Interactive comment on "Polyols and glucose particulate species as tracers of primary biogenic organic aerosols at 28 french sites" *by* Abdoulaye Samake et al.

Anonymous Referee #3

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General Comments.

This manuscript presents an interesting data set, treating aerosol PM10 and PM2.5 composition for a number of Traffic, Urban and Rural sites across France that is important for the understanding of aerosol sources over continental west European areas. From this data set the manuscript focus specially in the polyols and sugar components with the objective of determining the importance of this group of organics and their sources in the atmospheric aerosol loading. Unhappily the manuscript is not well presented. The first part, 3.1 to 3.4 sections, is mostly descriptive, showing average values and variability for polyols and glucose across sizes, seasons and regions. The

authors try to evidence the importance and contribution of those compounds to the aerosol loading in a somehow enthusiastic and forced way. They have the tendency to present more maximum concentrations than average values. The second part, section 3.5, deals more specifically with the evaluation of the Polyols source composition and contribution to the aerosol loading, using mainly PMF analysis. However the authors only show the PMF results concerning the source associated to polyols, remitting the reader to an unpublished manuscript for further scrutinizing of the aerosol total source apportionment and this is not acceptable. Furthermore, the so-called PMF calculated PBOA source factor has a mass that is more than 30 times higher than the measured polyols without a clear explanation about how can this result from primary particulate biomass emissions. I have some doubts about the correctness of this source factor as discussed further in the Specific Comments part. Therefore, I recommend that the manuscript is reorganized and modified in order to provide a more detailed information and discussion of the sources of the atmospheric aerosol and the contribution and importance of polyols and sugars as sources of the particulate pollution.

Specific Comments.

Line 174- "130 Different chemical species"? I only counted around 40.

Line 175- Table S2 instead of S1?

Line 194- "BC" instead of "EC"?

Line 200-204- The imposition of these constrains may not influence artificially the composition results? Anyway, the PBOA source calculated still has important contributions of unexpected EC.

Line 2017- Which is the necessity of having a Figure S3 that is very similar to Figure 2? Substitute Figure 2 in the text by Figure S3.

Line 232 Figure 3- If possible harmonize colors in this Figure with colors in Figure 2, for Mannitol, Arabitol and Glucose.

Line 233 Add "Average" initially to the sentence.

Line 256- Could you give some more information and reasoning about the removal of glucose from the PMF treatment?

Line 258- Change to "...the variability in the slope of the regressions between the chemical concentrations is most probably..."

Line 269- change to "to-PM2.5 ratios were..."

Line 356-366- There is a lack of information concerning average Polyols and glucose concentration values for the total sampling sites and perhaps either to each one of the four classified station types. A column to the right of the Figures 6 -8 with average values for the station ensemble would be informative.

Line 429 Figure 10- Which is the meaning of "*" in OC?

Line 447-449- The mass of EC contribution to the PBOA factor shown in Figure 11 is 3 times higher than the mass of soil estimated. Then, it is impossible to conclude anything about EC in soil from this data.

Line 453 Figure 11- The PBOA factor has an important contribution of EC (ratio of OC/EC equal to approximately 4.8, similar to values found in secondary organic aerosol formation). Therefore in my opinion this PBOA factor is probably highly contaminated with secondary organic material. That may explain the more than 30 times higher PBOA mass than the mass of polyols. However a more well based evaluation is impossible given the lack of complementary information from the PMF source apportionment.