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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Arabitol, mannitol and glucose as tracers of primary biogenic organic aerosol: influence of environmental factors on ambient air concentrations and spatial distribution over France" *by* A. Samaké et al.

Anonymous Referee #2

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This paper describes the evolutions of glucose, mannitol and arabitol in the aerosol covering 16 sites all over France. The study consists in a huge and precious dataset. For the first time, the distance-dependent correlation is demonstrated, investigating also the main drivers of atmospheric sugar concentrations.

General comment: please check all manuscript, including figures and tables, and modify the term "polyols" with "mannitol and arabitol", as necessary, to avoid confusion., as suggested in the initial revision.

Line 41-43. The authors affirmed that "sugar alcohols . . .- including arabitol and mannitol. . .- have been recognized as tracers for airborne fungi". One of the main objectives of my recent research is the source investigation of water soluble organic compounds, such as for example sugars, and I quite sure that some sugars alcohols have another source. For examples I saw that sorbitol have some correlation with biomass burning tracers, while arabitol and mannitol, mainly distributed in the coarse fraction of aerosol, plausibly originate from fungal spores. So, I suggest to focus your affirmation only on the arabitol and mannitol.

Line 45. The authors define glucose "a specific tracer for plant materials" but I think that the authors should remove "specific" because glucose can have different sources: plant materials, soil emissions (as suggested by the authors) and also marine biogenic material derived from degradation of polysaccharides present in the marine microlayer. I suggest to read some papers of Prof. Leck because she investigated the organic compounds (such as saccharides) in the marine aerosol. I know that the paper is focused on the aerosol samples collected in the areas far from the coast but in the introduction I think that the authors should consider all sources.

Line 174. Can you specify some details about the dataset matrix using to perform the normalized cross-correlation.

Line 257. You correctly affirmed that mannitol-to arabitol ratio can suggest the tempora and spatial evolution of their amission processes, using this reference: Gosselin et al. 2016. This paper demonstrated also that, in some cases, mannitol and arabitol can have different sources: "mannitol is a commonpolyol in higher plants while arabitol is only found in fungal spores and lichen". I suggest to insert this concept in the manuscript and to consider the R2 between two polyols in the discussion because maybe either conclusion can be also obtained (this is just a suggestion).

Section 3.2. The distance-dependent correlations and the SC evolution synchronous at an urban city scale and throughout the same geographical regions are the very

interesting topics in the manuscript and I appreciate this work because it was a lack of the sugars knowledge. The distance-dependent correlations is very clear using your approach but I suggest to clarify the main reasons for the decrease of NCC when the distance was above 200 km. You report some explanations but I suggest to deeply discuss the reasons or the suggestion of this behavior.

Line 301. Please remove “s” from “corresponds”.

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