

## ***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 #3**

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The manuscript “Arabitol, mannitol and glucose as tracers of primary biogenic organic aerosol: influence of environmental factors on ambient air concentrations and spatial distribution over France” describes the primary sugar compounds (SC, defined as glucose, arabitol and mannitol) concentrations in PM<sub>10</sub> for 16 increasing space scale sites (local to nation-wide), distributed in several French geographic areas of different environmental conditions. This paper first time investigates the spatial behavior of these chemicals and evidencing their major effective environmental drivers.

Major comments:

C1

- (1) Updating the references used in this manuscript to more current state is suggested.
- (2) LOD (limit of detection) of the detected chemicals should be included in the experimental section.
- (3) The regional transport is also very important for the spatial behavior and distribution of the chemical species in the ambient. In addition, only temporal variations and tracer ratios were shown and discussed in the results and discussion section. More deep analysis (i.e., the influences from nearby regions/sources, combine the chemical analysis results with synoptic data, . . .) are recommended to make this paper more interesting and innovative. At least, choose one or two cases to explain the contribution from regional transport by backward trajectory analysis.
- (4) Page 6, Line 174-180. The normalized cross-correlation (NCC) test was chosen in this manuscript, and author mentioned a thorough discussion on the normalized cross-correlation method can be found elsewhere (Kaso, 2018; Yoo and Han, 2009). However, there was no related applied reference of NCC method was given, more field observation references used this methods are suggested to add.
- (5) The lines in the figures are too thick to find the points, especially for Fig. (2a), Fig. (2b) and Fig. 5. It is difficult to separate the different color lines. Moreover, the thickness of the lines seems not consistent, i.e., the blue lines seem thicker than other color lines.
- (6) Figure S2 is suggested to add in Figure 3. Discuss the Normalized cross-correlation values for the daily evolution of particulate for glucose, polyols, calcium and sulfate together. It can exhibit the differences of NCC between these chemicals more directly. Moreover, how about NCC of other inorganic ions, i.e., NH<sub>4</sub><sup>+</sup>, NO<sub>3</sub><sup>-</sup> (similar as SO<sub>4</sub><sup>2-</sup>, are the main components of secondary inorganic aerosols), K<sup>+</sup> (biomass burning tracer) and Cl<sup>-</sup>.

Specific comments:

C2

(1) Line 190: The linear regression (lm) package in R was employed for multiple regression analyses. What does “lm” in the bracket means??

(2) Line 320: these findings highlight that particulate SC PM10 and cellulose in both urban background and rural agricultural areas. . . , should be changed to “these findings highlight that SC in PM10 and cellulose in both urban background and rural agricultural areas”

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