

The authors present aerosol measurements in a mixed deciduous forest above and below the canopy and more importantly include both horizontal and vertical transport mechanisms. They report similarity in the OA concentrations above and below canopy but also identify 4 different episodes, during which above and below canopy OA concentrations are different. PMF analysis is performed at two different levels, providing further insights into sources of OA. The manuscript is well written, the method and its limitations are thoroughly discussed, and the presented results are original. The manuscript is a very important contribution to the field, there are very limited studies reporting such analysis. Therefore, it should be published in ACP after minor revisions:

- 1) In the abstract, the author report that the differences in vertical concentrations reached up to $0.8 \mu\text{g m}^{-3}$. It would be useful for the reader to have the same information presented in terms of their percentages too.
- 2) In the introduction, the author discusses coupling conditions *“In this study, the degree of coupling was calculated using the ratio of the kinematic heat flux above the canopy to the kinematic heat flux in the upper canopy. Opposing kinematic heat flux directions (negative ratios) imply that the below- canopy environment is uncoupled from the atmosphere. In 2009, coupling conditions ranged between strong coupling, weak coupling, and uncoupled.”* Could you please add kinematic heat flux criteria used to separate between strong, weak and uncoupled conditions?
- 3) I really appreciate the author adding theoretical details of PMF analysis in section 2.3, however, the manuscript may read better if that was added in the supplementary document, where details/results of each PMF analysis are discussed.
- 4) In the caption of Figure 1, could you please explain the sampling of the OA time series presented in Figure 1 by adding that OA data are from both heights (6m and 30m), sampling switched measurement every 10 minutes between the two heights
- 5) In section 3.4.2, in line 561, the symbol, “ Δ ”, is used, without being defined, however, the author then explains the meaning of the symbol in the next paragraph on line 565. Could you please put those in the right order?
- 6) Line 567, the author says, "episodes of total OA factor vertical difference ($\sum\Delta$ OA) are shown in Figure 6". Could you please clarify the total of what? Is that total vertical difference for every 30 minutes?
- 7) Typo in the supplement: for the caption of Figure S26: instead of “dial” it should be “Diurnal”
- 8) In section 3.5, line 604, the author states, *“During Episodes #3 and #4, periods of above-canopy enhancement in OA factors coincide with relatively lower u^* ($u^* < 0.2$ m/s during Episode #3 and $u^* < 0.6$ m/s during Episode #4)”* Could you please clarify what u^* values are referred here? Are those based on averaged values during a specific episode? Also, u^* from which height?
- 9) A technical point, In Figure 5, it is not clear exactly which period of the time series are part of the individual episodes. It will be easier if you could you add vertical lines/ shaded area in those figures for those periods.