We thank the reviewer for the constructive and thoughtful comments. Please find below detailed responses to each comment or question, including notations of improvements to the manuscript. Reviewer comments are in blue fonts. Changes to the text are highlighted in yellow.

Overall: The manuscript in overall is very well written, and in agreement with scope of ACP. The scientific issues were well addressed, and are relevant. Several important measurements were performed, which were well treated and discussed, being an important scientific contribution. Therefore, I recommend publish the manuscript in ACP. However, I have few specific questions and technical corrections.

Specific comments and questions:

Line 105: Include references to support the affirmation "The hygroscopicities of typical inorganic in ambient particles are relatively well known"

Reference to Petters and Kreidenweis (2007) is now included.

Line 106: Please comment this sentence and clarify: "atmospheric aerosols consist of a large number of organic compounds, which often dominate the total fine aerosol mass". Which type of region, urban, rural, forest, etc?

The organics often dominate the total fine aerosol mass, especially in forested areas such as in Hyytiälä, Finland and the Amazon basin (Jimenez et al., 2009; de Sá et al. 2016). Organics also dominate total fine aerosol mass in some of the urban areas, such as the Mexico City, Edinburgh, and Zurich during summer time (Jimenez et al., 2009). We have updated the sentence and included additional references. The sentence is changed to:

…atmospheric aerosols consist of a large number of organic compounds, which often dominate the total fine aerosol mass, especially in forested areas (e.g., de Sá et al., 2016; Jimenez et al., 2009; Zhang et al., 2007).

Line 303-305: Why the authors use the same size distribution shape? What is the potential implications?

Given the low volume fraction of nitrate (see Figs 1 and 3-7), vast majority of the ammonium was associated with sulfate. Therefore, the assumption that ammonium had the same size distribution shape as sulfate should be appropriate.

Line 352: The authors said that it was correlated with concentrations of levoglucosan, vanillin and anthropogenic emission of aromatics. However, not mentioned in the section 2.4. this measurements. Please included.

These measurements and correlations are detailed in a manuscript that is in preparation (de Sá et al., 2017). The reference is included.

Line 393: Define CN

The definition (condensation nuclei) has been added to the text.

Line 428: The authors could explain or comment why no clear seasonal trend was observed for sulfate volume fraction?

This is a good question. The lack of a clear seasonal trend of sulfate volume fraction is consistent with observations at the ATTO site (Andreae et al., 2015). At this point, it is unclear what causes the relatively constant sulfate volume fraction despite the large variation in aerosol volume concentration. During dry season, there is a strong increase in aerosol volume concentration, and some of the sulfate is obviously from biomass burning. However the ratio of sulfate to organics is substantially higher than that of biomass burning aerosols, and additional sulfate from fossil fuel burning is likely needed to explain the ratio. This additional sulfate may come from a mix of emissions from the populated regions of northeastern Brazil, emissions along the river, and long range transport from Africa. A detailed analysis of the seasonal cycle of sulfate sources is outside of the scope of this manuscript. We have included the following sentence in the text:

The lack of clear seasonal trends of sulfate and organic fractions are consistent with observations at the T0a site (Andreae et al., 2015).

Lines: 431-432 and 442-443 its look contradictory as well in the conclusion, in lines 699-701 and 704-705. The authors said in lines 699-701: “The KCCN increased with particle size during all seasons, consistent with decreasing organic volume fraction: : :..”.However, when Korg increase the KCCN also increase according to text. Please clarify.

The statements are not contradictory. They address the impact on κ_{CCN} by organic volume fraction and κ_{org} value, respectively. Because of the relatively low κ_{org} value compared to those of inorganic species (e.g., sulfate), either a decreasing organic volume fraction or an increasing κ_{org} could lead to an increasing κ_{CCN}.

Technical corrections:

Line 105: “: : :typical inorganic in ambient particles: : :” better “: : :.typical inorganic particles in ambient: : :”

“typical inorganic in ambient particles” refers to inorganic species in ambient particles, which are often mixtures of both inorganic and organic species. Instead, “typical inorganic particles in ambient” implies ambient particles consisting of inorganic species only. Therefore, the first description is more accurate. We have changed “inorganics” to “inorganic species” for clarification.

Line 221: use PM2.5

The text already reads PM2.5 as suggested.

Line 228: missing comma or and

The platform described does have a lot of acronyms, but MAOS is a subset of AMF-1, as such, no and or comma is necessary.

Line 656: Use GoAmazon2014/5 as in others places (lines 687, 292, 249, etc)

Done.

Table 1: Put the meaning of K (Bkgd) in table footnotes

Done.

Figs. 9 and 10: increase the size of the word Korg as in fig. 11

Figures 9 and 10 have been updated.

References

Andreae, M. O., Acevedo, O. C., Araùjo, A., Artaxo, P., Barbosa, C. G. G., Barbosa, H. M. J., Brito, J., Carbone, S., Chi, X., Cintra, B. B. L., Silva, N. F. d., Dias, N. L., Dias-Júnior, C. Q., Ditas, F., Ditz, R., Godoi, A. F. L., Godoi, R. H. M., Heimann, M., Hoffmann, T., Kesselmeier, J., Könemann, T., Krüger, M. L., Lavric, J. V., Manzi, A. O., Moran-Zuloaga, D., Nölscher, A. C., Nogueira, D. S., Piedade, M. T. F., Pöhlker, C., Pöschl, U., Rizzo, L. V., Ro, C.-U., Ruckteschler, N., Sá, L. D. A., Sá, M. D. O., Sales, C. B., Santos, R. M. N. D., Saturno, J., Schöngart, J., Sörgel, M., Souza, C. M. d., Souza, R. A. F. d., H. Su, N., Targhetta, Tóta, J., Trebs, I., Trumbore, S., Eijck, A. v., Walter, D., Wang, Z., Weber, B., Williams, J., Winderlich, J., Wittmann, F., Wolff, S., and Yáñez-Serrano, A. M.: The Amazon Tall Tower Observatory (ATTO): overview of pilot measurements on ecosystem ecology, meteorology, trace gases, and aerosols, Atmospheric Chemistry and Physics, 15, 10723-10776, 2015.

de Sá, S. S., Palm, B. B., Campuzano-Jost, P., Day, D. A., Newburn, M. K., Hu, W., Isaacman-VanWertz, G., Yee, L. D., Thalman, R., Brito, J., Carbone, S., Artaxo, P., Goldstein, A. H., Manzi, A. O., Souza, R. A. F., Mei, F., Shilling, J. E., Springston, S. R., Wang, J., Surratt, J. D., Alexander, M. L., Jimenez, J. L., and Martin, S. T.: Influence of urban pollution on the production of organic particulate matter from isoprene epoxydiols in central Amazonia, Atmos. Chem. Phys. Discuss., 2016, 1-58, 2016.

Jimenez, J. L., Canagaratna, M. R., Donahue, N. M., Prevot, A. S. H., Zhang, Q., Kroll, J. H., DeCarlo, P. F., Allan, J. D., Coe, H., Ng, N. L., Aiken, A. C., Docherty, K. S., Ulbrich, I. M., Grieshop, A. P., Robinson, A. L., Duplissy, J., Smith, J. D., Wilson, K. R., Lanz, V. A., Hueglin, C., Sun, Y. L., Tian, J., Laaksonen, A., Raatikainen, T., Rautiainen, J., Vaattovaara, P., Ehn, M., Kulmala, M., Tomlinson, J. M., Collins, D. R., Cubison, M. J., Dunlea, E. J., Huffman, J. A., Onasch, T. B., Alfarra, M. R., Williams, P. I., Bower, K., Kondo, Y., Schneider, J., Drewnick, F., Borrmann, S., Weimer, S., Demerjian, K., Salcedo, D., Cottrell, L., Griffin, R., Takami, A., Miyoshi, T., Hatakeyama, S., Shimono, A., Sun, J. Y., Zhang, Y. M., Dzepina, K., Kimmel, J. R., Sueper, D., Jayne, J. T., Herndon, S. C., Trimborn, A. M., Williams, L. R., Wood, E. C., Middlebrook, A. M., Kolb, C. E., Baltensperger, U., and Worsnop, D. R.: Evolution of Organic Aerosols in the Atmosphere, Science, 326, 1525-1529, 2009.

Petters, M. D. and Kreidenweis, S. M.: A single parameter representation of hygroscopic growth and cloud condensation nucleus activity, Atmos. Chem. Phys., 7, 1961-1971, 2007.

Zhang, Q., Jimenez, J. L., Canagaratna, M. R., Allan, J. D., Coe, H., Ulbrich, I., Alfarra, M. R., Takami, A., Middlebrook, A. M., Sun, Y. L., Dzepina, K., Dunlea, E., Docherty, K., DeCarlo, P. F., Salcedo, D., Onasch, T., Jayne, J. T., Miyoshi, T., Shimono, A., Hatakeyama, S., Takegawa, N., Kondo, Y., Schneider, J., Drewnick, F., Borrmann, S., Weimer, S., Demerjian, K., Williams, P., Bower, K., Bahreini, R., Cottrell, L., Griffin, R. J., Rautiainen, J., Sun, J. Y., Zhang, Y. M., and Worsnop, D. R.: Ubiquity and dominance of oxygenated species in organic aerosols in anthropogenically-influenced Northern Hemisphere midlatitudes, Geophys. Res. Lett., 34, L13801, 2007.