Atmospheric
Chemistry
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Discussions

ACPD

Interactive
comment

Interactive comment on "Low hygroscopicity of organic material in anthropogenic aerosols under pollution episode in China" *by* Juan Hong et al.

Anonymous Referee #1

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The MS mainly deals with evaluating and interpreting the results of simultaneous measurements of hygroscopicity and chemical composition of aerosol particles in a diameter range of 30–145 nm in the Pearl River Delta Region in late summer. The performed work is definitely of scientific importance and relevance, its findings represent a valuable contribution to the increasing knowledge in this field. Nevertheless, the MS was prepared not enough in a careful way, and should be improved substantially before the paper can be accepted for publication. Some examples of this are given in Minor comments, and some other similar changes are also necessary.

Major comments

1. The authors should describe the exact calculation procedure possibly with mathematical equations for lines 171–174. 2. Sect. 2.1 and later. The arrival height of

150 m above the ground is unusually low, the model performs better at higher levels. This raises the question about the representativity of these air mass trajectories. The authors should discuss and explain their selection, and/or present similar trajectories for at least 2 more but larger arrival heights (e.g. one just below and one above the fee troposphere). In addition to that, the authors should describe how the major trajectory clusters and their frequency in Fig. 7 were exactly derived from the individual trajectories. 3. Aerosol particles are usually grouped as: nearly hydrophobic (κ<0.10), less hygroscopic (κ=0.10–0.20) and more hygroscopic (κ>0.20; Liu et al., Atmos. Chem. Phys., 11, 3479–3494, 2011). The authors may want to follow this attitude, or explain and argue for their own classification. 4. The authors are requested to extend the MS with explicit discussions and estimations of the uncertainty of their major conclusions to prove their significance. In addition to that, smaller changes throughout the MS, e.g. showing standard deviations of slopes for correlation lines in Fig. 10, and similar amendments could also be adopted.

Minor comments

1. It is disturbing that the terms aerosol – aerosols – aerosol particles are not used in a consistent manner in the MS (e.g. lines 64, 123 and 196). The authors should decide which option to use, and should adopt it in a coherent nomenclature. 2. Abbreviation PM stands for particulate matter (as correctly stated in line 191), but it is sometimes used for particle matter mass (e.g. line 30). The explanation of the abbreviation should be given at its first occurrence, and it is redundant to repeated it e.g. in lines 232–233. Furthermore, simply write for instance: "The PM2.5 mass concentration varied" instead of "The range of particle mass concentration (PM2.5) varied". In addition, it is not the range that varies. 3. Hygroscopicity usually refers only to sub-saturated conditions. Clarify line 65, or give appropriate references to back your statement. 4. Micron (e.g. lines 98, 177, Fig. 2) is not an SI unit. Micrometer should be used instead. 5. Remove the repetitions in lines 102–103 considering lines 67–69. 6. Revisit "self-assembly" (line 120) and "self-assembled" (line 152), or use

perhaps laboratory made instead. 7. Clarify lines 185–189. 8. Abscissa of Figs. 1 and 2 shows rather Date than Time, and its format of e.g. "(dd-MM)" could also be indicated. Furthermore, they could have (this) consistent format in both figures. In Fig. 2, how can be the probability in colour coding larger than 1? Explain or modify this. Put word space between measured values and their units everywhere in the figures. Extend the interpretation of your finding and discussions related to Fig. 2 within the frame of the conjunct conclusions of Cheung et al., Atmos. Chem. Phys., 16, 8431–8446, 2016. 9. Figures 3, 4 and 6 show the mean diurnal variations; the label of abscissa should be consistent in three figures; remove the tick label at 25; the time unit as "(HH)" should also be indicated; "during this study" is redundant; avoid abbreviations in the figure captions everywhere. Extend the interpretation of your finding and discussions related to the diurnal plots (Figs. 3 and 4 or Sects. 3.2 and 3.3) within the frame of the similar recent data of Enroth et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-926, 2017. 10. All correlation scatter plots should have squared layout to facilitate better their interpretations. 11. Rounding off strategy should be revised throughout the MS; e.g. of R^2 in the figures or HGForg in lines 399, 405 ("1 and 1.3"), 515 or 546. 12. Lines 288–289: Remove "black carbon or" from "with black carbon or soot". 13. Line 319: Consider writing "compounds with different water uptake ability" instead of "compounds of different water uptake ability".

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2018-77/acp-2018-77-RC1-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-77, 2018.