

Interactive comment on “Aircraft measurements of black carbon in the boundary layer over the North China Plain” by Delong Zhao et al.

Anonymous Referee #1

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This manuscript reports BC measurements on a series of aircraft flights along with some supporting met analyses. There are interesting measurements here, but the analysis presented is too unclear to merit publication in this state. I found the met analyses disjointed and unrelated to the results. The lack of comparison to prior work also makes the value of this contribution unclear. I would not recommend additional reviews without language editing as the results are very hard to follow given the language problems.

1. The language needs improvement as it contains poor grammar and obscure phrasing that prevent the reader from following the scientific points presented. Some examples are given below, but I did not provide a comprehensive list of the problems I found. I recommend that you send your manuscript to a language editing service. 2. Stop and

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start of EZ need to be defined quantitatively. P.7 says “where Rib firstly reaches” but this does not provide either a quantitative or an English definition. 3. The “dynamic air condition” is not a meaningful term. 4. Why FA not FT? 5. How is coating calibrated? What is uncertainty? Why is range 120-180 nm relevant for coatings? How will missing coatings on other particles affect the results? 6. What is lower cut of sp2? Does it capture all BC? Does that bias MMD? How much? What fraction of change in MMD is noise and what fraction is variability? Quantify and show. 7. The RH of the inlet to the SP2 is not specified; were particles dry or ambient RH or somewhere in between? Lack of this information makes the coating measurement meaningless as it is an artifact of the uncontrolled drying in the inlet. Suggest removing all coating data. 8. Text says BC was bimodal but then is fit with single MMD; this is counterintuitive. Two modes should be separated and separately fit. 9. The supplement includes poorly formatted plots for each flight that lack figure and panel numbers. There is no text describing this information and it is difficult to read. 10. Fig. S7 is supposed to show agreement between hysplit and synoptic, but they are not overlaid so agreement is difficult to support. A table summarizing quantitative degree of agreement would be much more useful. 11. What does it mean to say “the BC containing larger core was favorably removed”? I could guess, but this is simply too poorly stated to merit comment.

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