

Interactive comment on “Mixing layer transport flux of particulate matter in Beijing, China” by Yusi Liu et al.

Anonymous Referee #3

Received and published: 7 March 2019

General Comments:

The manuscript presents a good investigation by studying the transport flux of particulate matter in the mixing layer over Beijing area, one of the heavily polluted places in the country. The study employs ceilometer, Doppler wind radar, and other meteorological measurement techniques to determine the transport flux in the region.

Overall, the manuscript constitutes a good research article with clear conclusions, high quality figures, and great organization of the data. However, there seems to be a lot of room for English language improvement.

Specific Comments:

1, Line 26, define “fine particle” for its first appearance, e.g., PM2.5 or something else.

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2, Line 31, recommend changing to “Transport mainly occurs between 14:00 and 18:00 LT”.

3, Line 41, recommend changing “other provinces and cities” to “surrounding provinces and cities”

4, Line 46, define fine particulate matter as PM_{2.5} also if it is what the authors mean

5, Line 49, recommend changing “a steady decrease in poor air quality” to “steady improvement in air quality”

6, Line 77, recommend changing “. . .1.2% yr⁻¹. . .” to “1.2 percent per year”

7, Line 86, recommend changing “. . .the reliability of the model will decrease” to “. . .the reliability of the model cannot be guaranteed”

8, Line 91, recommend organizing it as “. . .transport flux (TF) in the mixing layer. . .”

9, Line 156-158, the way this sentence and next one were constructed will really confuse the readers. “Seasonal variation” means and focuses on the variation, i.e, the standard deviation. I think the authors is trying to express something like this: “In terms of seasonal variation, the means of MLH for spring and summer are relatively higher than those of fall/autumn and winter. However, WS was quite different from MLH, . . .”. For Line 166-169, according adjustment is recommended for the discussion of PM_{2.5} to avoid confusion.

10, Line 163-164, recommend changing to “. . .The average TC for summer, winter, and autumn were quite similar, with the VC values. . .”

11, Line 233-234, does the authors want to express this: “When MLH, WSML and VC were lower than 400 m, 2.5 m s⁻¹ and 1500 m² s⁻¹, respectively, the PM_{2.5} concentration decline sharply with these parameters increasing”? It is hard to imagine air pollution declines at these conditions not in favor of atmospheric dispersion.

12, Line 261, I think May TF of 269 mg m⁻¹ s⁻¹ was 1.5 times higher than August TF of

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106 mg m⁻¹ s⁻¹. Alternatively, you can express it as “May TF was 2.5 times of August TF”.

13, A general comment: when using “transport” and “transportation”, try to clarify it and avoid the ambiguity by meaning the transportation sector like vehicle emissions, since it is also great contributing factor for fine particle concentration.

14, Line 361-364, the expression in this segment could be revised to avoid negative image of the conclusion.

Technical corrections:

1, Line 20, change “atmospheric pollution” to “air pollution”

2, Line 24, change “weakens” to “weaker” or make alternative grammar corrections

3, Line 35, change “transportation influence” to “influence/impact of (air pollutants) transport”, otherwise it seems to mean the influence of transportation section like vehicles

4, Line 45, change “the Beijing’s air quality” to “Beijing’s air quality”

5, Line 48, change “Although Beijing’s government has been dedicated. . .” to “Although Beijing government has dedicated. . .”

6, Line 49-50, change “. . .ensure the continuous decline. . .” to “. . .ensure continuous decline. . .” or “. . .ensure the continued decline. . .”

7, Line 109, change “. . .More detail descriptions. . .” to “More detailed descriptions. . .”

8, Line 116, change “. . .remote sensor method. . .” to “remote sensing method. . .”

9, Line 120, change the long dash to short dash or change it to “to”

10, Line 150, change “. . .we carried out continuously measured. . .” to “. . .we continuously measured. . .” or “we carried out continuous measurement of. . .”

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Line 184, change “stable” to “relatively smaller”

Line 185, recommend changing to “which are ~ 4 h later than the peak and trough of MLH...”

Line 193, change “at the latest” to “later than other seasons”. “At the latest” means something else like a deadline.

Line 195, change “TC” to “VC” or change “VC” to “TC”, so that the same parameter is compared, even though we VC is used to express the magnitude of TC.

Line 236, change to “. . .than other seasons. . .”

Line 243, change “indicator factors” indicators” or “indicating factors”

Line 255-256, need improvement for this expression: “The northwesterly and westerly directions were the main transport sources of the cold period in Beijing.”

Line 257, change “increased” to “changed”

Line 286, change “rules” to “patterns”

Line 297, change “4” to “four”, please refer to manuscript preparation guidance about numbers.

Line 299, recommend changing “and we must pay attention to local pollutant emission control” to “and local pollutant emission control is the most effective way of mitigating pollution levels”

Line 346-347, change “the concentration of pollutants has a good relationship with VC” to “the concentration of pollutants is significantly correlated with VC”

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-141>, 2019.

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