

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

Yusi Liu et al.

tgq@dq.cern.ac.cn

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We would like to thank you for your comments and helpful suggestions. We revised our manuscript according to these comments and suggestions. 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: Comment 1: Line 26, define “fine particle” for its first appearance, e.g., PM2.5 or something else. Response 1: Thank

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you for your helpful suggestion. The definition of “fine particle” has been added to the paper. Comment 2: Line 31, recommend changing to “Transport mainly occurs between 14:00 and 18:00 LT”. Response 2: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 3: Line 41, recommend changing “other provinces and cities” to “surrounding provinces and cities” Response 3: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 4: Line 46, define fine particulate matter as PM_{2.5} also if it is what the authors mean Response 4: Thank you for your helpful suggestion. The definition of “fine particle” has been added to the paper. Comment 5: Line 49, recommend changing “a steady decrease in poor air quality” to “steady improvement in air quality” Response 5: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 6: Line 77, recommend changing “...1.2% yr-1...” to “1.2 percent per year” Response 6: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 7: Line 86, recommend changing “...the reliability of the model will decrease” to “...the reliability of the model cannot be guaranteed” Response 7: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 8: Line 91, recommend organizing it as “...transport flux (TF) in the mixing layer...” Response 8: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 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. Response 9: Thank you for your helpful suggestion. We apologize for this mistake. Similar errors in the full text have been corrected accordingly. Comment 10: Line 163-164, recommend changing to “...The average TC for summer, winter, and autumn were quite similar, with the VC values...” Response 10: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 11: Line 233-

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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. Response 11: This section has been deleted. Thank you for your helpful suggestion, and we apologize for this mistake. Comment 12: Line 261, I think May TF of 269 mg m⁻¹ s⁻¹ was 1.5 times higher than August TF of 106 mg m⁻¹ s⁻¹. Alternatively, you can express it as “May TF was 2.5 times of August TF”. Response 12: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 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. Response 13: Thank you for your helpful suggestion. Some ambiguity has been eliminated through the revision process, while the other instances can be understood by the context. Comment 14: Line 361-364, the expression in this segment could be revised to avoid negative image of the conclusion. Response 14: Thank you for your helpful suggestion. To avoid a negative image of the conclusion, this expression has been removed. Technical corrections: Comment 1: Line 20, change “atmospheric pollution” to “air pollution” Response 1: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 2: Line 24, change “weakens” to “weaker” or make alternative grammar corrections Response 2: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 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 Response 3: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 4: Line 45, change “the Beijing’s air quality” to “Beijing’s air quality” Response 4: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 5: Line 48, change “Although Beijing’s government has been dedicated...” to “Although Beijing government has dedicated...” Response 5: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 6: Line 49-

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50, change "...ensure the continuous decline..." to "...ensure continuous decline..." or "...ensure the continued decline..." Response 6: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 7: Line 109, change "...More detail descriptions..." to "More detailed descriptions..." Response 7: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 8: Line 116, change "...remote sensor method..." to "remote sensing method..." Response 8: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 9: Line 120, change the long dash to short dash or change it to "to" Response 9: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 10: Line 150, change "...we carried out continuously measured..." to "...we continuously measured..." or "we carried out continuous measurement of..." Response 10: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 11: Line 184, change "stable" to "relatively smaller" Response 11: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 12: Line 185, recommend changing to "which are 4 h later than the peak and trough of MLH..." Response 12: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 13: Line 193, change "at the latest" to "later than other seasons". "At the latest" means something else like a deadline. Response 13: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 14: 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. Response 14: Thank you for your helpful suggestion. After careful consideration, we think that "atmospheric transport capacity" is prone to ambiguity, so we changed "atmospheric transport capacity (TC)" to "atmospheric dilution capability". Comment 15: Line 236, change to "...than other seasons..." Response 15: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 16: Line 243, change "indicator factors" indicators" or "indicating factors" Response 16: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 17: Line 255-256, need improvement for this expression: "The northwesterly and westerly directions were the main transport

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sources of the cold period in Beijing.” Response 17: Thank you for your helpful suggestion. This phrase has been revised to “The transport sources of the cold period in Beijing were predominantly from the northwesterly and westerly directions.” Comment 18: Line 257, change “increased” to “changed” Response 18: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 19: Line 286, change “rules” to “patterns” Response 19: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 20: Line 297, change “4” to “four”, please refer to manuscript preparation guidance about numbers. Response 20: Thank you for your helpful suggestion. We apologize for our carelessness. The text has been revised accordingly. Comment 21: 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” Response 21: Thank you for your helpful suggestion. The text has been revised accordingly. Comment 22: Line 346-347, change “the concentration of pollutants has a good relationship with VC” to “the concentration of pollutants is significantly correlated with VC” Response 22: This section has been removed. Thank you for your helpful suggestion.

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