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

Anonymous Referee #1

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To quantifying the transport flux of atmospheric pollutants for understanding the causes of atmospheric pollution levels and development of decisions regarding the prevention and control of atmospheric pollution, the mixing layer height and wind profile inside the mixing layer were measured by ceilometer and doppler wind radar, respectively. The variation characteristics of atmospheric transport capacity (TC) were analyzed on this data base: TC is strongest in spring and weakest in autumn. The TC influence on the PM2.5 concentration was determined and there shows a strong inverse correlation between the PM2.5 and TC in spring, autumn and winter and a weak positive correlation in summer. The transport flux (TF) of fine particles in Beijing is highest in spring and lower in the other three seasons. The transport occurs mainly between 14:00 and 18:00âĂŁLT. The TF was large in the pollution transition period and decreased during

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[Discussion paper]

heavy pollution periods. General comments The application of TC, TF and VC should be explained in more detail: why these parameters are used and which advantages it provides in comparison to alternative parameters. It is concluded that the transportation influence in southern regions is of higher influence in the transition period of pollution, while local emissions are more important in the heavy pollution period. My main concern is why the whole discussion with TC, TF and VC up to chapter 3.2 is without wind direction. In chapter 3.3 it would be helpful to discuss MLH also. The conclusions are a summary and in this summary no relation to the existing knowledge / papers are given. What is new and what is supported by this study? The paper addresses relevant scientific tasks. The paper presents novel concepts, ideas and tools. The scientific methods and assumptions are valid and clearly outlined so that substantial conclusions are reached. The description of experiments and calculations allow their reproduction by fellow scientists. The quality of the figures is good. The figure captions should be improved so that these are understandable without the overall manuscript: terms must be explained, description of parameters. The related work is well cited so that the authors give proper credit to related work and own new contribution. The title as well as the abstract reflects the whole content of the paper. The overall presentation is well structured and clear. The language is fluent but must be improved in much details. The mathematical formulae, symbols, abbreviations, and units are generally correctly defined and used. Specific Comments Line 46: The values are valid for which time period? Line 57: How TC is defined? Reference? Line 59: What about wind direction? Line 64: How VC is defined? Reference? Line 81: When this happened? Lines 110 – 113: This explanation is not correct. Explain clearly what do you mean. Line 116: What is -dβ/dx? Line 128: time resolution not time accuracy Lines 142 – 144: Why this is an explanation? Height profile instead of "by height" Line 353: How PM2.5 concentration is related to photochemical reactions? Line 366: concentration column? What do you mean? Technical corrections Indicate if there are papers in Chinese.

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