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Atmospheric Chemistry and Physics Discussions

Interactive comment on "East Asian dust storm in May 2017: observations, modelling and its influence on Asia-Pacific region" *by* Xiao-Xiao Zhang et al.

Anonymous Referee #2

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This paper, determined dust emission, transport, and deposition during the May 2017 Asian dust storm using environmental observations and remote sensing data along with simulation techniques, this combined approach will aid in identifying the range of transport of dust across East Asia and the North Pacific Ocean. However, there are some problems you should clearly explain and corrected before this paper is accepted. 1. Page 2, line 3, you said "This dust storm originated from the deserts of Central and East Asia, namely the Mongolian Gobi Desert, Taklimakan Desert, Hexi Corridor, and Alxa Desert (Fig. 1).".Therefore, it is recommended that you mark the Mongolian Gobi Desert, Taklimakan Desert, Hexi Corridor, and Alxa Desert position in Figure 1. 2. Page 2, line 15, you have said "Dust aerosols can be transported long distances,

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even on a global scale". Therefore, I suggest you should explain in detail the path of dust aerosols transport. 3. Page 5, line 31, you have said "In this study, we selected the dust emission scheme of Shao et al.". Please explain the difference between this scheme and other programs, and further obtain the advantages of this scheme. 4. Page 6, line 26, you said "Aeolian dust migrated eastward to the Central China Plain in the lower reaches of the Yellow River and degraded air quality". It is recommended to quantify the extent of the decline in air quality by specific numerical values. 5. Page 6, line 27, you have said "Dense dust clouds continued to move east to southeast China where high PM10 concentrations were observed on the Shandong Peninsula on 5 May, 2017.". Please specify the value of PM10 at this time. 6. Page 7, line 10, you have mentioned the quality assurance confidence, please specify the calculation method of quality assurance confidence. 7. Page 8, line 29, you have mentioned "However, the dust deposition rate over Chinese deserts has been reported to be 70 times larger than over the North Pacific Ocean". Please explain how this result was obtained. 8. Page 10, line 17, you have said "In general, long-range transport Asian dust originated from the Gobi Desert or other sources can significantly elevate ambient particulate matter concentration and affect air quality in major cities of China, Mongolia, Korea, Japan, and far beyond.". Please explain how to get this result, if you get it from other articles, please list the documents that you refer to. I think the following two articles will help you: (1) Chen S., J. Huang, J. Li, R. Jia, N. Jiang, L. Kang, X. Ma, and T. Xie, 2017: Comparison of dust emissions, transport, and deposition between the Taklimakan Desert and Gobi Desert from 2007 to 2011. Science China Earth Sciences, doi: 10.1007/s11430-016-9051-0. (2) Uno, I.; Wang, Z.; Chiba, M.; Chun, Y.; Gong, S.; Hara, Y.; Jung, E.; Lee, S.; Liu, M.; Mikami, M.; Music, S.; Nickovic, S.; Satake, S.; Shao, Y.; Song, Z.; Sugimoto, N.; Tanaka, T.; Westphal, D. Dust model intercomparison (DMIP) study over Asia: Overview. Geophys Res. 2006, 111(D12), 2503-2511, DOI: 10.1029/2005JD006575. (3) Huang J P, Minnis P, Chen B, Huang Z, Liu Z, Zhao Q, Yi Y, Ayers J K. 2008. Long-range transport and vertical structure of Asian dust from CALIPSO and surface measurements during PACDEX. J Geophys Res, 113: D23212

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