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Interactive comment on “Regional characteristics of spring Asian dust and its impact on aerosol chemistry over northern China” by Y. L. Sun et al.

Y. L. Sun et al.

Received and published: 28 December 2006

New Comments: In the paper from the same group named “Composition and mixing of individual particles in dust and nondust conditions of north China, spring 2002” published in JGR have given the light sight about the mixing of pollution aerosol and mineral aerosol during the transport at different regions. Although, it was the data collected in 2002, the result of this idea has been set.

Authors Response: The paper “Composition and mixing of individual particles in dust and nondust conditions of north China, spring 2002” in JGR studied the mixing of pollution aerosol and mineral aerosol from the point of view of individual particles. Individual particle analysis can provide us useful information on morphology of particles and the chemical composition of individual particles. Thus it could be used to study the transformation of particles during its transport. However, individual particle analysis

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could not be identical to bulk aerosol analysis because it could not reveal the changes of chemical characteristics of total aerosol. Moreover individual particle analysis is often limited to the number of samples. So though the paper in JGR had given a light sight on the mixing of pollution aerosol and mineral aerosol through individual particle analysis, it's necessary to further investigate them through bulk aerosol analysis. Also, the mixing of pollution aerosol and mineral aerosol is complex, and it's not possible to clarify it only by a case study.

New Comments: This work (with only one year's field observation) could not reveal the transformation mechanism of dust storm during the long-range transport without the necessary lab and modeling work.

Authors Response: We agreed the referee's comment. Our work couldn't reveal the "detailed" transformation mechanism of dust storm during its long-range transport. And we really need to do lab study and modeling work to investigate it. However before doing lab study and modeling work, we need to know the aerosol characteristics in different regions of China. Moreover we need to know how dust storm affects the aerosol components at different regions during its transport and that's right a focus of our work.

New Comments: The similar results about buffering effect from dust have been published such as: * Nishikawa, Masataka; Kanamori, Satoru; Kanamori, Nobuko; Mizoguchi, Tsuguo, Science of the Total Environment, 1991, 107,13-27 * Wang, Z.F., Aki-moto H., Uno, I., 2002. Neutralization of soil aerosol and its impact on the distribution of acid rain over East Asia:Observations and model results. Journal of Geophysical Research.107, D19: ACH 6-1-6-12. * Zhang, Y., Carmichael, G.R., 1999. The role of mineral aerosol in tropospheric chemistry in East Asia - a model study. Journal Applied Meteorology 38, 353-366. * Byung-Gon Kim, Soon-Ung Park,Transport and evolution of a winter-time Yellow sand observed in Korea;Atmospheric Environment 2001,35,3191-3201 etc.

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Authors Response: Some works mentioned by the referee do have studies of buffering effect of dust, most of which were investigated by modeling work. Furthermore, what they studied was different and also different from our work. For example, the paper (Wang et al., 2002, JGR) mainly investigated the buffering effect of soil aerosol on the “precipitation” in East Asia, and another two papers (Kim et al., 2001, Atmospheric Environment & Nishikawa et al., 1991, Science of the Total Environment) did not refer to the buffering effect of dust, but the possible formation of sulfate and nitrate on the mineral particles. While our work was mainly concerned about how dust affected the acidity of “atmospheric aerosols” over northern China. What we used was the pH values of aerosols which were different from previous studies. In addition, our data, in some certain, could also be used to confirm the results of modeling.

New Comments: Then I’d like to suggest that the author combine the 2004 and 2006 data to make a new better manuscript, which would be better choice.

Authors Response: That’s a good suggestion. We will combine the data collected in 2004 and 2006 in the future and try to get more new findings. That’s would be another good manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 12825, 2006.

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