

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

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Thank you very much for the referee's comments.

Our studies focus on the aerosol concentration and composition of spring aerosol and its impact on aerosol chemistry over northern China. Though many previous studies were related to the aerosol characteristics in northern China, they were mostly restricted to either a single sampling site or limited aerosol components, which hardly provide a full-scale understanding of the regional characteristics over northern China. Our studies were based on the aerosol data collected synchronously at six sampling sites from desert region to coastal areas. Moreover, not like the referee said, we got many interesting results from these data. For example, 1) we first divided northern China into five regions based on the aerosol data. The analysis of aerosol components including elements and ions confirmed further the regional characteristics of spring

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aerosol over northern China. Our results could be important to study the mixing of pollution aerosol and mineral aerosol during the transport at different regions. In addition, our field data could be used to verify the results of model simulations. 2) As we have six sampling sites at different regions over northern China, we can easily see how the Asian dust impact atmospheric environment in the cities over northern China during its transport and how the dust storm affect different components in the aerosols. It's very important to study the transformation mechanism of dust storm during the long-range transport. 3) We found that spring dust could lead to the pH in the aerosols over northern China increase  $\sim 1$  in spring. As we all know that dust has a buffering effect on the acidity of atmosphere over northern China, but here we used the field aerosol data to prove further this neutralization effect.

In this paper, we only used the aerosol data collected in 2004. However we also collected the aerosols in 2006 at five sampling sites as mentioned in the paper. The analyzing and data processing is on-going. The results will be prepared in another paper.

We agreed the referee's comment that some discussions in this paper were disordered. In the revised version, we moved the section 3.1 into section 3.4 and made a big revision on it.

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