**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

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

Anonymous Referee #1

Received and published: 9 January 2007

I would agree with Reviewer 2 that this paper does not add much to the scientific understanding of dust episodes in China, a topic that is widely studied in the past. The abstract raised my expectation that this is a rigorous analysis but I felt somewhat disappointed after reading the manuscript. I found that this is a cursory statistical analysis of the spatial variation of different types of components in aerosols. I have reservations on the segregation of the sites into five regions based on API/PM10 data to analyze dust episodes. The conclusions, including some on reactions, are based on statistical analyses of relatively few samples and are not convincing. Last but not the least, this manuscript is very similar to a recent paper by similar authors "The evolution of chemical components of aerosols at five monitoring sites of China during dust storms", Atmospheric Environment, 41, 1091-1106, 2007, which was not cited in

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

EGU

this paper. I would expect that this is the responsibility of the authors to highlight the differences between the current manuscript and the above paper. Overall, I cannot recommend the paper for publication in ACP.

In addition to the above major overall comments, below are some specific comments:

1. The authors divided north china into five regions using the concentration of PM10 in 13 cities which calculated through API from EPA china (line 20, 12831). Can the data of these 13 cities reflect all the characterization in north china? The authors didn't address the reasons or rules why these 13 cities but not others (e.g. Jinan, Harlbin) were chosen? Justifications of the choice of these cities are needed.

It would be useful to readers if the authors can elaborate explicitly on the results of varimax factor analysis was conducted. It appears that only PM10 concentrations were involved (line 11, 12803). How was it done? It does not seem to be to use this division based on PM10 alone without information of the aerosols for studying dust storms.

The regional division confuses the readers. Shanghai is a coastal megacity in Eastern China; Qingdao is coastal but much smaller city in Northern China; Shenyang is an inland big-city and is well known for its heavy industry. Is it reasonable to lump all these cities as in a coastal region?

2. The authors said in the paper that data were collected in 6 places (Duolun, Yulin, Beijing (2 sites), Qingdao, shanghai) along the transport pathway of dust storm. Here, shanghai is not in North china and does not seem to be in the usual pathway of dust dorm (Figure 11). There are two sites, Miyun and BNU, both in Beijing and they should experience the same effects of dust episodes. Hence, one can argue that these data actually represent measurements from only 4 different sites in the pathways of two dust storms. As emphasized by the authors, the whole North China, encompassing a wide range of areas (13 cities were mentioned by the authors), was divided into five regions. The data the authors presented here are not enough for characterizing the effects of dust storm on so-called "five regions" in North China.

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

EGU

3. The explanations of the elemental concentrations and sources appear to be arbitrary and not convincing. For example, the authors attributed high Fe/Al in Beijing and Shanghai to steel works (Table 3; line 13, 12834). However, in Beijing, MiYun has a "normal" value of Fe/Al (0.63) but BNU shows a high value (1.03).

5. I agree that mean values in the period including the dust storm may be too much affected by the dust storm. However, it does not necessarily mean that the median values are the representative parameters for non dust storm days. The choice to use the median values seems somewhat arbitrary to me.

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

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

EGU