

Interactive comment on “Size-resolved source apportionment of ambient particles by positive matrix factorization” by J. S. Han et al.

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1. (p5231) Biomass burning is changed into biomass/biofuel burning.
2. Chinese aerosol will be changed into continental aerosol. This source is a kind of soil dust. However, it is not overlapped with soil dust and other sources. Generally, the composition of soil is considerably different according to the source region. The difference between soil composition measured in China and Korea has been already studied in previous works. In this study, the soil dust originated from distance, especially in China, was separated from local source by PMF analysis. The former is called “continental aerosol” and the latter “soil dust” in this study.

(Reference)

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Liu, C. L. et al. (2002) Spatial and temporal variability of trace metals in aerosol from the desert region of China and the Yellow Sea, *J. Geophys. Res.*, Vol 107 (D14), doi: 10.1029/2001JD000635.

Sun, J (2002) Provenance of loess material and formation of loess deposits on the Chinese Loess Plateau, *Earth and Planetary Science Letters* 203, 845-859.

Han et al. (2004) Soil chemical properties in Asian Dust source region in northern China (in Korean), *Journal of Environmental Impact Assessment*, Vol. 13 (6), 277-284.

3. Volcano emission was corrected to “volcanic emission”

4. Episodic analyses using meteorological information are added to this paper using backward trajectory model (HYSPLIT 4) with back trajectory graph:

(a) continental aerosol, (b) soil dust, The difference between continental aerosol and soil dust was definitely observed in the backward trajectory analysis using HYSPLIT4 (Draxler, 2004). Figure 7a and 7b respectively shows the back trajectories in 3 hr intervals observed when the intensities of continental aerosol and soil dust source were independently higher than other periods as shown in Figure 6. The trajectories reveal that continental aerosol was transported from further regions including northeastern China than soil dust.

(c) biomass/biofuel burning, Figure 7c shows that the backward trajectories from 9 to 11 May and at 16 May 2002 when the intensity of biomass/biofuel burning source was relatively high. The trajectories passed by not only the cultivated regions in central China but also the forests and grassland located in northeast China and North Korea. Therefore, it is inferred that this source includes field combustion of agricultural residues as well as biofuel combustion.

(d) ferrous metal source (coarse), (e) ferrous metal source (fine), As shown in Figure 7d and 7e, the difference of trajectories when they respectively have high intensities also supports the separation of two ferrous metal related sources. The source in coarse

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size range was estimated to be transported from southern industrial regions in South Korea while fine aerosol source regions related to the steel industry could be mainly located in major industrial areas in northeastern China.

(f) volcanic emission Finally the volcanic emission source, containing large amount of Al, Si, K, Ca, and Fe, was resolved in the fine size range (0.56~0.75 μ m) when the trajectories passed around Kyushu Island in which there are several active volcanoes as shown in Figure 7f.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 5223, 2005.

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