Atmos. Chem. Phys. Discuss., 8, S4635–S4637, 2008
www.atmos-chem-phys-discuss.net/8/S4635/2008/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "An investigation into seasonal and regional aerosol characteristics in East Asia using model-predicted and remotely-sensed aerosol properties" *by* C. H. Song et al.

C. H. Song et al.

Received and published: 10 July 2008

First of all, thank you for your valuable comments and suggestions. In this revised manuscript we tried to clarify what we intend to discuss in this manuscript by eliminating, modifying, and adding several parts from/into the original text (the added/modified parts are painted in a red color). Also, we improved many figures (Figs, 1, 2, 4, 7, 8, 9. 10, 12, 13) in this revised manuscript. Below are our replies to your comments:

1. It does not become clear what is the additional value to include AOD from BAER, if compared to MODIS AOD data, other than to show that these are "highly correlated". On the other hand, there are occasions when they are not: in fall of Figure 12. However,

in this case, the reason for clear differences BAER behavior in fall of Figure 12, if compared to MODIS is not discussed. What might be the reason for the differences?

Reply) Although the primary purpose of this study was to investigate seasonally- and regionally-varying aerosol characteristics in East Asia, we also aimed at testing two aerosol retrieval algorithms in East Asia. The reasons of using the two aerosol retrieval algorithms in this study are described at p.6:6-7:7. Also, the comparison between tMODIS and tCMAQ provides us a good opportunity to investigate the accuracy of emission fluxes of particulate precursors. In order to investigate this, we re-drew (re-analyzed) Fig. 8 over four regions in our domain. Please check out the revised Fig. 8. We also added more discussions into the text, regarding dust/sea-salt generations, biomass burning, and NH3 emissions in China. Please, refer to p. p28:3-p.29:12, p.30:6-22, and p.33:17-34:2.

2. Related to this, BAER algorithm is described in some detail and reference for MODIS AOD Collection5 is given. However, it is not made very clear what are the major differences between BAER and MODIS Collection5 algorithms. One gets an idea that they are likely in the treatment of surface reflectance, but this should be clearly elaborated.

Reply) In the revised text, the detailed differences are more clearly discussed. Please, check out Sect. 3.2 as well as newly-added Table 2.

3. The section 4.1.1 somehow seems to be in a wrong place, if in the Results section. Could it be already in the section 2, and here in the section 4 it could be referenced?

Reply) We agree with you. In the revised manuscript, we moved the Sect. 4.1.1 into Sect. 3.3. (Sect. 2 is a modeling description part). Also, we also put more discussions in Sect 3.3. Please, check them out.

4. Figure 4 is an important one, but the details are very difficult to see, even if made larger in the screen. For instance, detail like whether the scale is same in the AOD figures (three uppermost panels for BAER, NASA, CMAQ) is not entirely obvious. Maybe

ACPD

8, S4635–S4637, 2008

the quality of these figures could be improved somewhat.

Reply) We improved the quality of Figs. 4 and 7 in several ways (e.g., one large scale bar and larger scripts).

5. In the sentence "In Fig. 4, the spatial distributions of episode-average ...". Please remind here, for clarity, that the episodes are defined in the end of section 2.1. Section 8678, line 3 and onwards: "Therefore, the many pixel values ..." It is not clear from Figure 5 that cloud-screening algorithm has rejected aerosol pixels as clouds. If you state this (and put it more speculative way in the section 5: "This may have arisen due to the cloud pixel screen-out ..."), it should be easy to check with the MODIS data that this really was the case. How you done this?

Reply) Fig. 4 is now re-drawn with averaged t values over satellite overpass times. We also excluded cloud-filtered pixels as well as sun-glint pixels in Figs 4. We also calculated Table 3 again. Please, refer to p.20:21-21:2.

7. In section 8662, for t both sub-scripts of AERONET and AERONETR are used (AERONETR is also in few other places, while AERONET is more commonly used).

Reply) The part that included those mistakes is not deleted.

8. Please check and correct these. In section 8787, please replace Dubobik by Dubovik.

Reply) It is corrected at p.35:4.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 8661, 2008.