

# ***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.***

**Anonymous Referee #1**

Received and published: 27 May 2008

## *General comments*

Aerosols play a crucial role both in climate and air quality and there exist uncertainties in our current knowledge of the related processes. This manuscript of Song et al. presents a study of spatio-temporal aerosol characteristics in East Asia, using CTM simulations together with satellite- and ground-based AOD data. The topic of this manuscript is of importance, covering a broad range of interesting results. There are few things that clearly need to be clarified, some others need to be explained in more detail. I think the paper can be published in ACP, if these issues mentioned below, are

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addressed in the revised manuscript.

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?

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.

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?

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 the quality of these figures could be improved somewhat.

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?

### *Specific comments*

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

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Please check and correct these.

In section 8787, please replace Dubobik by Dubovik.

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

ACPD

8, S3063–S3065, 2008

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