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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Overview of the Mount Tai Experiment (MTX2006) in Central East China in June 2006: studies of significant regional air pollution" *by* Y. Kanaya et al.

Anonymous Referee #1

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This paper is to provide an overview of the MTX2006 campaign. Both the objectives and the major findings of MTX2006 were given briefly. In general, the manuscript is well organized and is helpful to catching the whole picture of MTX2006. Thus, it doubtless merits publication at this ACP special issue. The followings are my comments and suggestion for the potential revision of this manuscript.

1. It was indicated that the general objective of MTX2006 was to quantify the air quality in the region. However, according to the aims listed in Sec 2 and the published papers of MTX2006, it is very much an atmospheric chemistry experiment with focus at ozone and aerosols. Thus, as an overview paper, the readers would expect to see a

synthesis discussion upon the air quality implications of the great scientific findings. 2. The boundary layer dynamics is among the major mechanisms controlling the diurnal variations of the measurements of gaseous and aerosol species. Do you have a paper discussing the influences of boundary layer and/or general meteorological conditions during MTX2006? If not, I'd like to suggest giving a summary in this overview paper. 3. (P1538) It was indicated that "In conclusion, the air quality at the top of Mt Tai is comparable to that in the outflow region or even the urban Beijing". However, the above "conclusion" was drawn merely from the measurements of OC and EC in aerosols. I suggest making the conclusion specifically on the levels of carbonaceous aerosols (i.e. OC and EC) instead of generally on "air quality". 4. (P1539 and Fig 6) It was observed that "BC showed high concentrations in early morning". What were the potential sources of the early morning BC (without substantial increases in CO)? 5. (P1539) I cannot follow the calculation of aerosol radiative forcing. How did you obtain the value of 55W/m2 for aerosol RF? Besides, please note that the DRF efficiency given in IPCC (2007) is associated with substantial uncertainties. 6. (P1541) The authors argued that the high O3 in June at Mt Tai was due to biomass burning. However, as indicated there, the average impacts of OCRB to O3 was only 6%. Thus, it seems that the conclusions did not get support from the results of data analysis. 7. (P1542-1543) Regarding the attribution of O3, it was indicated in Sec 6.3 that "photochemistry in the surrounding region is more dominant than transport". However, in Sec 6.4, it was argued that "O3 transport is more important than in-situ photochemistry". Thus, the results from the two studies disagree with each other and could confuse the readers. 8. (P1544 and Figure 4) OPEx of 5.8 was derived from the measurements of O3 and NOz and, as indicated the authors, is comparable to the OPEx around Beijing. However, Beijing is known as an urban area where O3 production is mostly limited by VOC, whereas Mt Tai case was suggested to be NOx-limited. Actually, in a NOx-limited case, the production of NOz should be retarded and thereby the OPEx is expected much higher the observed level. Please include further evidences to support the "NOx-limited" conclusion. 9. (P1545 and Figure 4) Higher OPEx given by model was indicated but did not get well

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explained. Comparing Figure 4c with 4f, I wonder if the model had underestimated the formation of NOz and therefore gave higher OPEx. 10. (P1551) It was shown that peaks of organic aerosol tracers of biomass burning were observed in early morning. This is consistent with the early morning BC peak shown in Figure 6. I'd like to suggest incorporating the data of organic tracers and BC to investigate the transport of biomass burning BC in this region.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 1527, 2013.