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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Regional-scale modeling of near-ground ozone in the Central East China, source attributions and an assessment of outflow to East Asia – The role of regional-scale transport during MTX2006" *by* J. Li et al.

**J. Li et al.**

Received and published: 29 September 2008

We would like to thank Referee #1 for his/her useful comments on our ACPD paper. His/her comments allowed us to improve the paper. Response to the Specific comments by Reviewer #1

General comment: Overall, the study presents a clear analysis using novel data - surface ozone concentrations are quite rare in China, especially in the highly polluted CEC region. The authors focus on June, the month of maximum monthly mean ozone concentrations in the region, and employ the NAQPMS model for their analysis (developed by co-author Z. Wang, and appears to be similar to widely used chemical transport

models such as CMAQ and WRF-Chem). By contributing to an important region for air quality analysis and atmospheric chemistry, the paper should be of interest to ACP readers and would be suitable for publication with minor revisions.

Response: We greatly thank the reviewer # 1.

Comment 1: the authors must devote significant effort to editing for English, grammar, and figure correctness. Specific examples are noted below under Technical comments, but the extent of errors throughout the text is a significant problem.

Response: We have invited a native English speaker to improve the language in the paper.

Comment 2: the authors should discuss how their study year, study month, and individual case studies compare with other years, other seasons, and characteristic weather patterns in the region. Section 3.2.2 and figure 7 focus on the specific meteorological conditions associated with the high- and low-ozone case study periods. This analysis would be made more relevant if it were compared with meteorological behavior beyond these three case studies. The authors note that a forthcoming paper will evaluate the seasonality of ozone at Mt. Tai, but some general points on seasonality, interannual variability, and the representativeness of the selected case studies should be included here as well.

Response: We agree with that it is important to discuss general points on the seasonality interannual variability. The climate of central east China (CEC) is largely related to the monsoon system. Consequently, the regional transport exhibits a significant seasonal cycle. In spring, frequent cold surges likely blows southeastwardly produced ozone into northern parts of central eastern China to the entire CEC, while regional-scale transport of ozone photochemically produced in the southern parts of CEC is the dominant factor in summer. This is done in the revised version in the "Discussion" section. Meanwhile, discussions about the representativeness of the selected case and comparison with other characteristic cases are given in section 4.2, the first and



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fifth paragraph. We compared these three cases with a typical Mei-yu condition which often appears in CEC in summer and suppresses regional transport of ozone. The results also suggest the important role of regional transport in summer high ozone at the observed site.

Comment 3: Title is too long, and contains a minor English error ("the Central East China" should be "Central East China")

Response: We agree. We have changed the title to "Near-ground ozone source attributions and outflow in central eastern China during MTX2006".

Comment 4: p. 13162, last paragraph - Some comment here on how June 2006 compares with other years would be valuable

Response: We agree. In the revised version, we compared the monthly mean ozone in this study with data in 2004 and 2003. The result showed that the ozone level measured in this study was the highest in recent years. This suggests that this study is favor of proving insights into understanding of air pollution in CEC.

Comment 5: * p. 13167, last paragraph - "The observed mean of

Response: We have revised it.

Comment 6: *p. 13169, in discussing Figure 3a, I would recommend discussing Case I first, then Case II (currently, II is discussed before I).

Response: We agree and revised it.

Comment 7: p. 13172-13173, the meteorology associated with Cases I, II, and III should be put in context - were these unusual weather patterns? Or were they typical?

Response: The reasons include three points: the first is that the meteorology associated with these cases often appears in May-June. For example, the regional transport resulting from high pressure in East China Sea in Case I have also been reported by Wang (2006) and Shan (2008). The second is that Case I and II are the highest ozone



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concentrations periods. Ozone levels in Case I (100 ppbv) and II (97.2 ppbv) are much higher than the monthly mean value (85 ppbv). The third is that three time periods cover regional transport of both the southern (Case I and II) and northern (Case III) parts of CEC. And understanding the related meteorology is helpful to reveal the mechanisms of these cases

Comments 8: p. 13168 "reprehensive" should be "representative"; "systematic underestimated" should be "systematically underestimated"

Response: We have revised it.

Comment 9: p. 13171 "takes the most fractions" should be "contributes the greatest fraction"; "sources regions" should be "source regions"; "formeing" should be "forming"

Response: We have corrected it.

Comment 10: p. 13173 "dominated" should be "dominant"

Response: We have corrected it.

Comment 11: * p. 13174 "underlyingsurface" should be 2 words; "CHMSEA" should be "CHNSEA"

Response: We have corrected it.

Comment 12: Figure 8 needs labels for a, b, c, etc.

Response: We have corrected it.

Comment 13: * All figures need larger font for numbers on legend and on contour lines. Numbers are too small to read on printed version of paper.

Response: We have corrected it.

Comment 14: * p. 13176 "month mean" should be "monthly mean" Response: We have corrected it.



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References:

Wang, Z, Li, J., Wang, X., Pochanart, P., Akimoto, H.: Modeling of regional high ozone episode observed at two mountain sites (Mt. Tai and Huang) in East China, J. Atmos. Chem., 55(3),253-272, doi: 10.1007/ s10874-006- 9038-6, 2006. Shan, W., Yin, Y., Zhang, J., Ding, Y.: Observational study of surface ozone at an urban site in East China, Atmos. Res., 89(3):252-261, doi:10.1016 /j.atmosres. 2008.02.014

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 13159, 2008.



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Interactive Comment