

## ***Interactive comment on “Impact of open crop residual burning on air quality over Central Eastern China during the Mount Tai Experiment 2006 (MTX2006)” by K. Yamaji et al.***

**Anonymous Referee #3**

Received and published: 21 December 2009

This manuscript addresses the impact of crop residue open burning on O<sub>3</sub>, CO, BC, and OC concentrations at Mount Tai during MTX2006, based on numerical modeling (CMAQ). Unlike earlier studies (using annual emissions), the authors utilized daily emissions from crop residual open burning based on a bottom-up methodology and using land cover and fire hotspot information from satellite imaging. The model captured observed monthly-average concentrations and day-to-day variations in the pollutant patterns.

While there is good consensus regarding the importance of biomass burning in terms of the impact on regional air quality and global climate, which resulted in a number of

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recent observational and modeling studies, agricultural residue (such as cereal straw) burning and domestic biofuel use have not been investigated to a an extent required for an accurate assessment of their influence on the above-mentioned processes. Therefore, the study reported in this manuscript appears to be highly relevant to the scientific discussion on the impacts of biomass burning, despite possible shortcomings in the modeling approach.

As outlined by the two other reviewers, there are inherent limitations in the capabilities of the model as it is applied to a specific, isolated, location (summit of Mt. Tai). In general, this referee agrees with the concerns of his co-reviewers and will thus not reiterate their comments. Nevertheless, the present study appears worthwhile to be published, provided the authors address the questions and comments of the referees in their revised version of the manuscript.

Below is a list of suggested technical corrections:

1. p. 22105, lines 2-3: "Black Carbons" and "Organic Carbons" should be changed to their singular form: "Black Carbon" and "Organic Carbon".
2. p. 22105, line 19: It may sound better to say "high-pollution episode" or "pollution episode" rather than "polluted episode". This would then need to be changed throughout the manuscript.
3. p. 22105, line 24: It might read better if "to evaluate" is changed to "in the evaluation".
4. p. 22105, line 25: The typos in "secondly pollutions" need to be corrected to "secondary pollutants".
5. p. 22106, line 8: "a largest" should be changed to either "the largest" or "a large".
6. p. 22107, lines 14 and 16: The plural of "emission" should be used.
7. p. 22107, line 19: Likewise, "sources" should be replaced for "source".

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8. p. 22107, lines 23-24: same as under No. 1. This correction should be done throughout the manuscript.
9. p. 22108, line 13: There is a typo in "MOerate".
10. p. 22108, lines 23-24: The phrase "emission spatial intensities" sounds awkward or actually unclear.
11. p. 22108, line 26: What do the authors really mean by saying "focus on"?
12. p. 22109, line 7: "special" needs to be changed to "spatial".
13. p. 22111, line 4: "pollutions" should be replaced by "pollution" or "pollutant".
14. p. 22111, line 18: "pollutants" should be in singular form: "pollutant".
15. p. 22111, line 19: The term "fossil" could be added before "fuel".
16. p. 22112, line 10: Change "isoprene and terpene were" to "including isoprene and terpenes, were".
17. p. 22112, line 21: "agriculture" should be changed to "agricultural".
18. p. 22113, line 21: Change "emission over CEC was" to "emissions over CEC were"
19. p. 22116, line 12: Perhaps change "cleaner episode" to "cleaner period".
20. p. 22117, lines 1, 2, 19, and 21: Change "polluted" to "pollution".
21. p. 22118, line 12: The expression "observation campaign base studies" sounds awkward.
22. p. 22118, line 28: "and that mean" may be replaced by "indicating".
23. p. 22123: There are numerous awkward or non-scientific terms throughout this entire page that should be reworded.
24. p. 22124, line 1: What are "smooth" hotspots"?

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25. p. 22125: See comment under No. 23.
26. p. 22127 - 22132: Use consistent and appropriate style for the references.
27. p. 22135: Correct typo in "Mounthly".

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Interactive comment on *Atmos. Chem. Phys. Discuss.*, 9, 22103, 2009.

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