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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evaluating the influences of biomass burning during 2006 BASE-ASIA: a regional chemical transport modeling" *by* J. S. Fu et al.

Anonymous Referee #1

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The authors studied the influence of biomass burning on regional air quality using CMAQ. I have mixed feelings about this paper. Although this paper has some interesting sections, such as the comparison of the FLAMBE and GFED emission inventory, this study needs extensive sensitivity studies and validation efforts (e.g., as suggested below) before the community can take the results of the study seriously.

(1) The authors showed comparisons of modeled and satellite NO2 and AOD. Although satellite CO and O3 retrievals are also available, I wonder why the authors didn't include these data in their analysis. Comparisons of modeled and satellite CO and O3 need to be included in the analysis. Also monthly mean O3, CO, NO2, and AOD plots from

both satellite and modeled data are needed as a part of the validation efforts.

(2) The authors showed vertical distributions of CO, O3 and PM2.5. However, without validating/comparing their results with observations, such study brings little value to the community. I would recommend that the authors at least show comparisons with CALIOP data.

(3) In table 3, the authors showed the model evaluation of CO, O3, and PM2.5 using observations from Hong Kong and Taiwan. The authors need to include some kind of estimates of statistical significance or, at least, the authors should include the number of data samples used in the analysis.

(4) Besides emission inventory, how would other parameters affect the results? The authors should show a sensitivity study of various factors on their study, such as the wet/dry deposition. In fact, a comprehensive sensitivity study is necessary before the users can gain a better appreciation of their study.

(5) The authors used an empirical method to convert CMAQ aerosol concentrations to AOD. What is the wavelength of their AOD estimates? I am surprised that fixed mass extinction efficiency values were used because such values vary with wavelength. Also, the authors need to do a literature review and use recent estimates of mass extinction efficiencies from publications.

(6) The authors compared modeled PM2.5 values with ground observations from Hong Kong and Taiwan. What about AOD? I believe there are several AERONET sites available within the study region.

Other comments:

(1) Page 32209, line 1, I could not find Zhang, 2008 in the reference list.

(2) Page 32211, line 28, "ef" should be "EF".

(3) Page 32214, line 13-14. There are two MODIS AOD products available. Which

product do the authors refer to here?

(4) Page 32239, line 3, “and at 550nm” should be “at 550 nm”

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 32205, 2011.