

Interactive comment on “Cross-hemispheric transport of central African biomass burning pollutants: implications for downwind ozone production” by E. Real et al.

Anonymous Referee #1

Received and published: 30 August 2009

This manuscript uses observations from AMMA along with two models to examine the role of cross-equatorial transport along with downwind transport of O₃. The observations that there were episodic pulses of elevated ozone and ozone precursors from Central Africa during July and August 2006 that penetrate the MT and UT. The authors conclude correctly that these pulses were associated with biomass burning. Further they conclude that elevated O₃ in the UT contributes to the observed ozone maximum over the tropical Atlantic. The findings are interesting and the work contributes to the discipline. However, several issues should be addressed:

1.) Your model calculations suggests that the BB plume transport is capable of main-

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taining O₃ levels at 80 ppbv. However the observations show reduced O₃ as you move further downstream. Does this mean that your production terms are too large or your sink terms are too small???

2.) Does your model suggest that the pulses are episodic or continuous. Would that lead to higher O₃ levels in the MT?

3.) You have not determined the role of LNO_x in elevating O₃ in the UT or potential downward transport by convection into the MT in your model. Do you have observations of lightning activity during your period of observations in 2006?

4.) Jenkins et al. 2008 show that ozone concentrations are elevated in the UT when compared to the MT over the tropical Atlantic. This is opposite to what you have found. How does this fit in the context of your work with an emphasis on the trajectory analysis in Figure 9. Given that observations from Jenkins et al. 2008 were conducted during the early period of AMMA it should be referenced in the introduction section.

5.) Are there satellite observations showing an elevation in Tropospheric column ozone during July and August 2006 thereby confirming your model simulations??

6.) Have you examined the SHADOZ downstream stations (Ascension Island) or South American Stations to verify what is proposed by the model. For example, one might expect at trend toward elevated UT O₃ at ascension Island and elevated MT O₃ over the south American stations based on the trajectories in July/August 2006.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17385, 2009.

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