

## ***Interactive comment on* “Tracing biomass burning plumes from the Southern Hemisphere during the AMMA 2006 wet season experiment” by C. H. Mari et al.**

### **Anonymous Referee #1**

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**Summary** The authors use the FLEXPART model as a proxy for tracing biomass burning emissions from the Southern to the Northern hemisphere. The model does show a transport from southern to northern tropical latitudes. This paper could provide greater insight to the reader if some additional care is taken. Please look at the comments below.

There are still several issues that should be addressed:

1.) In figure 1, why are you averaging over two different longitude ranges for the different periods? Why are you averaging over the ocean areas in the Southern hemisphere?

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2. It is not clear why there should be a jet in the southern hemisphere. First, it would seem to me that the surface temperature gradient would put the AEJ-S at much lower latitudes over land points. A plot of 925 hPA temperatures would confirm stronger temperature gradients in more southerly latitudes. Second, if you look at your averaging of longitude it is completely out over the ocean. Is the AEJ-S at this longitude an extension of what is happening over land?

2.) This jet is rather weak. It is clear what is responsible for its variability? In fact, is it influenced by the convection which propagates from east to west on a daily basis?

3.) Is the break in the AEJ-S linked to deep convection? Could you get satellite data to confirm that that this is the case? Daily OLR should do the trick. What is the mean flow during the break.

4.) Based on your study, the active AEJ-S is responsible for northward transport. Could you show a horizontal plot of the average flow (based on ECMWF model for example) during AEJ break and AEJ-S Active. It would help the reader to understand the flow patterns.

5.) Why did you choose to do averaging over the ocean entirely for the tracer (Figure 4)? I would expect SE flow patterns over the ocean which would transport fire emissions to the Northeast.

6.) Does the FLEXPART model explain the low ozone signal at 2 km based on the ozonesondes in Figure 5. It is very well mixed each day up to 2 km but up to 4 km on August 17th (not consistent with the FLEXPART model).

7. You show the tracer reaching 12 km during the AEJ-S break. Please explain what is happening. Do you see a signal in troposphere ozone to confirm that this is the case?

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 17339, 2007.

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