

## ***Interactive comment on “OMI observations of the anomalous 2008 Southern Hemisphere biomass burning season” by O. Torres et al.***

**Anonymous Referee #3**

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The manuscript provides an interesting analysis of the southern hemisphere distribution of biomass burning aerosols over South America and Africa. The distribution is anomalous for 2008 over South America and the South Atlantic ocean compared to the three years before, but not over Africa. The anomaly over South America is attributed to changes in soil management practices and/or enforcement of regulation. The change over the South Atlantic is attributed to a more efficient transport due to stronger free tropospheric winds in 2008.

Although the presentation of the anomalies is convincing, the explanation for the change in biomass burning in South America is not. The change in UVAI and fire counts are clearly coupled, and it is shown that they are not directly related to changes in precipitation over SA. This is presented as proof for the absence of a meteorological

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explanation for the anomaly. A map with the reduction of the 2008 fire counts compared to those in 2007 shows political boundaries of the Brazilian state Pará, which is very intriguing. However, I'm not convinced that this is proof for governmental enforcement of fire regulations.

First, meteorological connections are dismissed by a rather simple comparison with local precipitation. Biomass burning will be influenced by precipitation, clearly, but also by the availability of biomass and maybe other factors. The availability of biomass can be affected by precipitation, temperature and other climatological factors during the growth seasons, months before the actual burning. Therefore, a climatological or meteorological connection for the anomalous 2008 SA biomass burning is not ruled out by the comparison with precipitation alone.

Furthermore and more importantly, the biomass burning season for 2008 over SA is anomalous when compared to 2005-2007, but not when compared to the period 1978-2007, as shown convincingly by the long term record of the AI. Years with a low maximum of AI during the biomass burning season are quite common, which is rather intriguing. It is not likely that fire regulations are enforced irregularly during those years. A climatological connection would be more probable.

The political boundaries that show up in the fire count maps are interesting, but some proof of the increased enforcement of fire regulation in the states bordering Pará should be presented to convince me of the reason for the reduced fire activity as presented in the manuscript.

These issues should be addressed to improve the scientific quality of the paper.

Minor comments:

p 21510, l 26: Norwest Paraguay -> Northwest Paraguay

p 21514, l 1: Middle -> middle

p 21514, l 1: Fig. 2 -> Fig. 4

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p 21515, l 8: Matto -> Mato ?

p 21515, l 8: It seems to me that the reduced fire activity is in all states bordering the south-east boundary of Pará. An indication of the state boundaries may help, also to show more convincingly the relationship between the observed reduction in fire activity and political boundaries.

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