Atmos. Chem. Phys. Discuss., 9, C2456–C2457, 2009
www.atmos-chem-phys-discuss.net/9/C2456/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Direct measurements of the effect of biomass burning over the Amazon on the atmospheric temperature profile" *by* A. Davidi et al.

Anonymous Referee #2

Received and published: 4 July 2009

It is comforting to see notions of aerosol effects on stability confirmed with data, but there are some other questions about this study that need to be addressed before it is accepted.

1. Why not use MISR AOD, which many people consider to be more accurate than MODIS over land?

2. The authors are mixing aerosol absorption with extinction. The heating is by absorption rather than extinction, and the effect of aerosol on transmission to the surface depends on more than extinction. At the very least the authors should acknowledge that their analysis depends on the assumption that the aerosol optical properties vary

much less than the mass concentrations, and provide some support for such an assumption.

3. Page 12014, line 18. What are the expectations based on? There are no measurements of absorption, so how can you estimate an expected warming?

4. Page 12015, lines 4-8. I am not convinced that the increase in cloud cover with AOD is purely a microphysical effect. Have you estimated the amount of water vapor emitted by the fires, and how that might contribute to the increased cloud cover? How do the vertical profiles of water vapor correlate with AOD? The saturation effect could be point where the reduced supply due to surface cooling overcomes the increased supply by combustion. If AIRS can't be used to address these questions, what can radiosondes tell us?

5. Table 1 is unclear. Delta T cannot represent the temperature difference between 850 and 1000 hPa because it is listed for both levels. So what is it?

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 12007, 2009.