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Atmospheric Chemistry and Physics Discussions

Interactive comment on "An overview of the Amazonian Aerosol Characterization Experiment 2008 (AMAZE-08)" *by* S. T. Martin et al.

Anonymous Referee #2

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General comments The paper presents an overview of AMAZE08 results already published and also some new insights. It surely provides integration between the different publications and points out to key aspects obtained with the experimental setup as related to the characterization of biogenic aerosols.

Specific Comments Page 10 session 3. Observations and findings – The months of February and March correspond to the wet season in the Amazon. Day to day satellite images show that cloudiness is a constant feature sometimes organized in large westerly travelling systems and sometimes more local systems (Greco et al, 1990, Cohen et al 1995). In Machado et al 1998, specifically in their Fig. 5c, it is seen that during the wet season (DJF) cloud systems have lifetimes of about 12 hours and travel due west. The point here is that the synoptic trajectories represent averages over a large amount

of vertical recycling that goes on in convective clouds as soon as the air mass enters the northern coast of South America and over the 1600 km of pristine forest until reaching the AMAZE08 experimental sites. In the Tropical Atlantic the air mass originated in Africa has to go through some recycling also due to convection in the ITCZ. In the approximate 10-15 days that it would take to go from Cape Verde to the Amaze08 site, the air mass might have gone through vertical loops in perhaps half the number of days. As reported by Andrea et al 2001, the convective trajectories of air can have some unexpected results as updrafts and detrainment heights provide a pathway for the low level air mass to reach different heights, with differing synoptic wind directions. Freitas et al 2006 show that the plume rise from vegetation fires in the Amazon can be ejected at different heights thus providing an explanation for the layered structure often seen by LIDAR in the region. Page 10 line 220 – predominantly and consistently – this is an average that is continuously disrupted by convective cloud systems and associated up and downdrafts. Page 10 lines 228 – 240 – the long range transport is a possibility but with some uncertainty. Local sources to the Northwest of the region may have to be taken into account as they not necessarily associate to fresh biomass burning material if the material has had a lifetime of several days until reaching the experimental site (see Freitas et al 2006). Page 22 – reference to recently published Poschl et al 2010 Science paper Page 27 – lines 596-605 – I am not sure I follow your reasoning. What exactly is considered a good agreement with ground observations? The statement ". . .suggest that precipitation from cold-cloud processes can be expected with progressive frequency for cloud temperatures of -20C and colder" is something that should be expected even without these new measurements. . . So what is really new?

Refs. Andrea et al.. 2001.Transport of biomass burning smoke to the upper troposphere by deep convection in the equatorial region In Geophysical Research Letters. , v.28, 951-954 Cohen, J. C. P., M. A. F. Silva Dias, C. A. Nobre (1995), Environmental conditions associated with amazonian squall lines: a case study, Mon. Wea. Rev., 123, 3163-3174 FREITAS, S. R. ; Longo, K. M. ; Andreae, M. O. . Impact of including the plume rise of vegetation fires in numerical simulations of associated atmospheric

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pollutants. Geophysical Research Letters, v. 33, p. L17808, 2006. Greco, S., R. Swap, M. Garstang, S. Ulanski, M. Shipham, R. C. Harriss, R. Talbot, M. O. Andreae, P. Artaxo (1990), Rainfall and surface kinematic conditions over central Amazonia during ABLE 2B, J. Geophys. Res., 95, 17001-17014. Machado, L. A. T., W. B. Rossow, R. L. Guedes, A. W. Walker, 1998: Life Cycle Variations of Mesoscale Convective Systems over the Americas. Mon. Wea. Rev., 126, 1630–1654

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