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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Physical properties and concentration of aerosol particles over the Amazon tropical forest during background and biomass burning conditions" *by* P. Guyon et al.

Anonymous Referee #2

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Comments on: Physical properties and concentrations of aerosol properties over the Amazon tropical forest during background and biomass burning conditions Authors: P. Guyon et al.

This paper describes the aerosol optical and size distribution properties during two seasons, wet and dry, above the Amazon forest canopy. Dramatic changes in the particle number concentration, scattering coefficients and AOD were found between the two seasons due mostly to high wet deposition losses during the wet season and biomass smoke aerosol during the dry season. Substantially lower single scattering albedos were observed from biomass smoke aerosol. The authors give a detailed and well needed analysis of the instrument uncertainties and corrections. The paper

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gives significant scientific information of smoke aerosol from this region as well as an important procedure for correcting Radiance nephelometers for truncation. I strongly recommend this paper for publication.

Overall I have few specific comments. I would like to see an analysis of the MOUDI data from this campaign especially with regard to calculated refractive indices, mass scattering and absorption efficiencies. There is a reference for a paper on refractive indices. Would it be possible to add a section on mass scattering and absorption efficiencies or is this to be published in another paper?

You note on pages 1376 and 1377 that no fire pixels were observed from AM and RO from satellite data during the end of the first campaign from 13-21 May and that smoke aerosol was likely transported from other regions. Is there any way to estimate the contribution of local biofuel burning to the observed aerosol? Would burning of wood, dung or propane for cooking or even diesel fuel from cars have a different signature than aerosol from crop burning? A way to estimate this may be to look at the aerosol data during the dry season during periods of very low wind speeds ($<$ 3 ms-1) and compare this to times with longer range transport or higher wind speeds.

On pages 1379-1380 the optically active aerosol layer during the smoke season is relatively low (1.1 km) but with a low r2 value of 0.44. This low r2 value may indicate a highly variable aerosol layer and/or many days with an elevated aerosol layer.

P. 1389. Because aethelometers typically do not have corrections for scattering, the absorption coefficients from these instruments will be higher than those from a PSAP.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1367, 2003.