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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Synergetic measurements of aerosols over São Paulo, Brazil using LIDAR, sunphotometer and satellite data during the dry season" *by* E. Landulfo et al.

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Reply to the comments of anonymous referee

We would like to thank his/hers helpful comments.

(1) Text rearrangement.

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Interactive Discussion

Discussion Paper

We should follow the suggestion gave by referre in merging sections 2 and 3 in order to achieve more consistency putting together the trajectory model and the MODIS description. References by Marenco et al. (1997) and Chazette et al. (1995) should be added as well.

(2) Sensor description

For the MODIS AODŠs retrieval we followed the procedure given by Kaufman et al (1997), in these the AOD at 550 nm is given in 10 km resolution cloud screened, in KaufmanŠs article the algorithms given are matched for the multispectral reflectance observations in order to lookup the pre-computed reflectance tables. Regarding the retrieval of the optical thickness overland accuracy, the aerosol optical thickness products over land are accurate to within their calculated uncertainties (ś0.05ś0.20*tau), except in situations with possible cloud contamination, over surfaces with subpixel surface water such as coastal areas and marshes, and over surfaces with subpixel snow or ice cover.

(3) Categorizing the LIDAR profiles

The idea of categorizing the profiles came to to us as an easy way to make some systematics in the many days which we carried out our measurement. In the revised paper we should be adding an average of all days in years 2001 and 2002 we got profiles and showing the differences in the morphology of each profile concerning the categorization. When one look to each category assessing the following features:

(a) number of layers and their height Category A shows at maximum one layer and above 1.5-2.0 km it is considered to be an aerosol free atmosphere (b less than 0.005 km-1sr-1); Category B shows more layers and above 2.5-3.0 km Category C show layers above 3.0 km

(b) Potential Sources Category A is positively a kind profile where the aerosol load are originated in the neighbourhood of the LIDAR site.

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Category B has components from local sources as a some residual layer which coud be originated in previous days when some accumulation occured.

Category C has a distinctive pattern from category B since its shape up to 2.0 Ű 2.5 km is very similar to category A, which might be an indication the atmosphere above would be aerosol free, with the exception that a large layer in higher heights suggests that a long-range transportation might be occuring from remote areas outside the metropolitan area of São Paulo, which in cases of days 09/24/2001 and 08/23/2002 it is revealed by sattelite and trajecory analysis that some of the aerosol load is coming from the outskirts of the Amazon Basin where biomass burning activities are taking place.

(c) Meterology Category A days are sunny days preceeded by rainy days where a wash out of pollutants ocurred, with very little wind and an high temperature amplitude and visibility conditions are extremely good (5-10 km);

Category B days are a series of days without rain with some scattered clouds, and the presence of some wind at ground level and higher altitudes, concerning visibity they are hazy therefore the conditions are not so good as in category A;

Category C days are dry and with very poor visibility conditions, with some occurences of thermal inversions, they are without clouds and with little wind as well at ground level.

(4) AOT statistics Additional tables are provided summarizing all LIDAR measurements taken and they should be included in the final revision and giving more consistency to the lidar ratios previously given. In the tables we will show. Day: Days of the measurements were performed Category: Category for the Aerosol Profile. LR1 : Lidar Ratio retrieved from CIMEL. LR2 : Lidar Ratio used by LIDAR with th 10% approach. LR3 : Lidar Ratio applied to obtain a matching between the AOTŠs provided by CIMEL and LIDAR. AOT1 : AOT provided by the CIMEL. AOT2 : AOT provided by the LIDAR. AOT3 : AOT provided by the LIDAR using the LR1.

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(5) Additional Trajectories Our main goal for showing the trajectories were to identify potential remote aerosol sources and since categories A and B are related to close sources we decided not include in the paper. But if this a bold issued we might include some trajectories for those categories as well.

(6) Final conclusions When we mentioned the profiles as input we intended to stress the LIDAR profiles obtained in general, and not specifically ours, in the case the Models would use the profiles, those would have be Retrieved by a Network or a mobile LIDAR for better resolution data input.

p2837, l28 There are two distinctive types of meteorological characteristics for the dry season, one which shows days with synoptic systems of low pressure associated with high wind speed and occasional rain, which are favorable to pollution dispersion, against days which are characterized by synoptic systems of high pressure that brought mostly sunny weather, low wind speed and a low height thermal inversion layer, in these conditions the pollution dispersion is rather unfavorable.

p2838,l27: It should be expected less than 5%, as we learned from both level 2.0 and 1.5 in 2001 data.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 2835, 2003.

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