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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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Positives - Daily MODIS high resolution data are certainly better than sporadic TOMS regional data (previously used)!

Concerns - Unclear if there are real matches in time between lidar and AERONET (matters for lidar-ratio) - No effort is made to extract MODIS values near Sao Paulo (great potential for consistency tests) - No effort is made to extract lidar-ratios from AERONET size-distributions

General comments

There are improvements following suggestions with respect to the initial version. (1)

spend more effort on data-intercomparison (e.g. same time, same wavelengths?): improvements (2) make better use of supplementary data (e.g. aots from MODIS): yes!... but must be further improved (3) make a better case with back-trajectories and include more cases: categorizing is a good idea.

The paper still needs some work before publication. The paper still appears in many ways patched together. Of concern are also the adopted column values from AERONET: Are AERONET data matched exactly in time to the profiles? How many samples go into the AERONET average? Any discrepancy is important, because ŚderivedŠ lidar-ratios are based on AERONET/lidar matches.

To clarify my concern, I picked Sept.19, 2001, a day for which I processed AERONET inversions. I found 3 inversion data for September 19 2001 (at 18:46, 19:34 and 19:56 UTC) with mid-visible (.55um) optical depth of about 0.24 (compare this to 0.12 in the paper), Angstrom parameter of 1.5 (1.9 in paper) and lidar ratio (0.55um) of 59 sr derived from the size-distribution (45in conclusions but 36 sr in chapter).

A lock at the AERONET website showed that in fact that at the lidar observation (14-15 GMT) two optical depth samples actually displayed a value of 0.12. The low aot morning value is hardly representative for the entire day. In that context, it seems important, that the backtrajectories (when?) refer exactly to 14-15 GMT (do they?).

Looking at another day (Sept. 24, 2001) there were no data for exact the time of the lidar observations [There were no inversion data for Sept.24, however, there was one inversion on Sept. 21at 18:48UTC: large optical depth (.94), lower Angstrom parameter (1.0) and lower lidar ratio (36 sr).] The ŚfittingŠ of the lidar ratios is extremely simple (especially with the assumption of constant aerosol density / properties below the lidar detection altitude). Why not deriving the lidar-ratios from the AERONET size-distributions? [My comparisons seem to suggest that the fitting method used in this paper leads to too low (column) lidar-ratios compared to RAMAN lidar data].

The description of the MODIS-sensor is great (too detailed), yet the most important

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description of the (displayed aerosol optical depth, what assumptions, what resolution) is missing.

A comparison of local 10*10km AERONET aots retrievals near Sao Paulo at times of AERONET measurements would be interesting.

The statement that ŞTOMS is unable to detect aerosol layers below 2.5kmŤ is not true (please contact Omar Torres at NASA-Goddard).

The last sentence in the conclusion is a bit strong, considering that CTMs have a rather coarse resolution and it is not clear (and probably unlikely) that the profiles at Sao Paulo are representative for the surrounding region given the local character of urban pollution.

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