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Interactive comment on “The global 3-D distribution of tropospheric aerosols as characterized by CALIOP” by D. M. Winker et al.

Anonymous Referee #2

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The paper presents a global 3-D distribution of tropospheric aerosol based on 6 years CALIPSO lidar (CALIOP) observations. For the first time this kind of study is possible thanks to the first satellite mission with lidar on-board. Even if limitations in the aerosol extinction retrieval exist, the presented results provide a significant improvement for the study of tropospheric aerosol on a global scale. The paper is well written and results are clearly presented. The paper is suitable for publication after minor revisions as reported in the following:

Figure 2: why error bars at about 4 km are so large for both profiles?

Page 24854 (line 27): the authors report that “To avoid underestimating the lowest part of the aerosol profile, when the base of the lowest aerosol layer is above the local surface but lower than 2.46 km, the “clear air” samples between the surface and the

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aerosol layer are ignored when averaging.” The authors should explain how the 2.46 km threshold has been selected.

Page 24858 (line 12-13): authors discuss differences between daytime and nighttime extinction profiles below 1 km of altitude. This is a low altitude range, probably often below the maximum surface altitude within the grid. Authors should explain how they have treated data below the maximum surface altitude consistently with what reported in the Lidar L3 Aerosol Profile Quality Statement. Because this can have a strong impact on the AOD; this should be clearly explained.

Page 24864 (line 8): Figure 15 (in place of Figure 14).

Appendix: probably this is not really necessary. The authors are suggested to provide in the paper the link to all these information available at the Langley ASDC.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 24847, 2012.

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