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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol climatology: on the discrimination of aerosol types over four AERONET sites" *by* D. G. Kaskaoutis et al.

D. G. Kaskaoutis et al.

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The length of the revised version has been reduced significantly. That is the 36 page original paper (excluding Tables and Figures) has become a 25 page (excluding Tables and Figures) revised manuscript. The above reduction consists of omitting several paragraphs, which refer to previous studies of general interest with no specific target on the subject of our study. In this way we limit our discussion to our results without extending an extensive comparison of them with those of similar studies. In the context of shortening the paper, Figure 3 was also omitted since the information of the Figure is also included in the next Figure 4 (now Fig. 3).

Our study mainly focuses on the determination and discrimination of the various aerosol types occurring over the four AERONET sites on a seasonal and inter-annual basis. Such results (with classification of various aerosol types studied over more than

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two AERONET sites) have not been presented in the literature,and it is highly interesting as also stated by referee 2.

Regarding the change in the threshold values we performed a sensitivity analysis. Therefore, in the revised version the following paragraph has been added. “The selected thresholds of the classification scheme are associated with some arbitrariness especially at the borderlines separating the different aerosol types. Therefore, modifying the threshold values can lead to changes in the percentages of occurrence of the different aerosol types (BU, CM, DD and MT). To assess the uncertainty in the selection of the threshold values, we have decreased the threshold α440-870 value from 1.5 to 1.4 (i.e., by 7%). This increased the yearly frequency of occurrence of BU from 41.8% to 46.2% (i.e., by 9.2%) in relative percentage terms in Alta Floresta and from 47.2% to 54.6% (6.2%) in Ispra. Similarly, an increase of α440-870 from 0.5 to 0.6 (i.e., by 20%) increases the frequency of DD aerosol type in Solar Village from 46.6% to 52.4% (i.e., by 9%) in relative percentage terms. These uncertainties have to be kept in mind when attempting similar aerosol classifications as that presented in this study. Nevertheless, uniform threshold values should be applied to different aerosol regimes to make possible inter-comparisons and highlight differences between them”. We would be happy however to see specific suggestions by the referee on how to improve our paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 6357, 2007.