

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

Anonymous Referee #2

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Using AERONET measurements of the spectral aerosol optical depth, this paper tries to establish a climatology of aerosol loading whilst trying to identify the type of the aerosol that contributes the most to the measured optical depth. This lengthy paper does not live up to those important goals. For this reason, I do not recommend publication. A much shortened analysis could well be submitted for publication.

General comments.

1. Length

This paper is not a review but reads like one. It is too long. This is extremely detrimental to the authors' work, since their analysis is completely shadowed by irrelevant citations and digressions. The reference list is much too long for this kind of study. Going

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straight to the point would give the paper a lot more impact. The core of the paper, i.e. the identification of the measured aerosol type, starts in the middle of section 3.3, after a lengthy description of the well-known seasonality of the industrial, biomass, mineral dust, and sea-salt aerosols. I acknowledge the authors' honesty, however, since the text states on many occasions that what they report has already been studied "many times".

2. Scope of the study

AERONET is a great tool, but it is correct that value must be added to its raw measurements. Identifying the aerosol type is exactly the kind of added value which is needed, so the authors are dealing with an important subject with many potential uses (identification of the anthropogenic component, validation of climate models, validation of advanced satellite products). But the amount of original work is disappointing. Basically, they apply an identification algorithm by Pace et al. (2006) to four AERONET sites where the aerosol type is quite obvious! I would have expected those four sites to be used to fine-tune the identification algorithm, and then the entire AERONET database would have been processed in order to provide a proper climatology.

3. Aerosol identification algorithm

Since virtually any aerosol type or mixture of types can be associated with any value of the optical depth, more information is needed. Here, the authors use an indirect measure of the size, the Angstrom exponent. It is a simple measure of the spectral dependence of the extinction optical depth. I have serious doubts that adding this information is enough. More is still needed (such as measurements of the absorbing properties). This is quite obvious when the authors' application of the algorithm classifies 40 to 50% of the aerosols as mixed. It is not necessarily a mixture. It could simply be an aerosol that does not fall straight into the narrow categories defined by the authors. The thresholds used by the Pace et al. (2006) algorithm have certainly been tuned for their usage, i.e. Mediterranean aerosols. Here, there is no discussion

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on the applicability of those thresholds to very different locations.

4. AERONET policy on publications

The AERONET website reads that “if the AERONET data are a principal component of the paper then co-authorship to PI's should be offered.” I reckon this is the case for this study, and that the acknowledgements are not enough.

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

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