

***Interactive comment on* “Classification of aerosol properties derived from AERONET direct sun data” by G. P. Gobbi et al.**

Anonymous Referee #2

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Review on the paper

Classification of aerosol properties derived from AERONET direct sun data

By Gobbi et al.

General comments:

The paper describes a simple classification scheme for the interpretation of sun photometer observations of aerosol properties. The method is in particular well suited for the application to AERONET data. The paper is well written and the method is in general well explained. However, I am not totally convinced that the method really provides a comprehensive tool, which covers the full diversity of existing aerosol properties. In addition, I have some doubts, if the proposed scheme really follows the best possible

strategy. Nevertheless, I think the paper can indeed contribute to the simplification and - probably more important - homogenisation of the large number of global sun photometer measurements. I therefore recommend the publication after the clarification of a few aspects (see below).

Detailed comments:

The proposed classification scheme is one of several possible schemes, into which the original information (optical depth at different wavelengths) can be transformed. The authors should more convincingly motivate this specific choice. In particular, it is not clear to me if this scheme makes really optimum use of the available information from the measurement.

On page 4, second paragraph it is mentioned that the model calculations are performed based on the Mie-theory. How representative are these calculations for non-spherical particles? Especially mineral dust and soot, for which the method is applied, are typically non-spherical.

How representative are the chosen bimodal size distributions? In reality, the aerosol compositions, especially close to the sources, might be much more complex.

In section 3 it is stated that only one 'reference grid' is used for the interpretation of the measurements. Is this really justified?

Correction:

Page 4, last paragraph: 'AdA-coordinates' should be replaced by a better description.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 8713, 2006.

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