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Atmospheric Chemistry and Physics Discussions

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

G. P. Gobbi et al.

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Anonymous Referee #1 Received and published: 1 November 2006 The paper presents a new simple method to compare results of a multiple parameter analysis of aerosol physical and optical parameters. The method allows to classify aerosol characteristics according to origin and physico-chemical or size composition. Some omissions are in the final analysis / discussion section of the paper that should be added to the final version and could improve the paper. I recommend the paper for publication with some minor corrections specific comments:

Referee#1: In the introduction the authors promise to demonstrate the effect of different size distributions on the angstrom coefficient. although some data are given later this demonstration is missing in the text later on.

Authors reply: The whole section 2 of the paper demonstrates the effects of different size distributions on the Angstrom coefficient (alfa). In fact, a variety of monomodal (i.e, fine mode fractional extinctions (eta) of 1% and 99%), and bimodal (i.e, intermediate fine mode fractional extinctions) distributions are employed to compute the points of our grids (e.g., Figs. 1 and 2). All our grids show that any Angstrom coefficient of a monomodal fine mode distribution can also be obtained by a variety of combinations of bimodal distributions. We believe this demonstrates "the effect of different size distributions on the Angstrom coefficient".

Referee#1: page 7, last paragraph, In Fig.3, Rome presents a case similar to Beijing and Kampur is not true. Rome is comparable to Kampur but not to Beijing. The differences between Beijing and the two other sites should be discussed.

Authors reply: The reviewer is right that in the Beijing example the high AOD growth along the 90% line is unique. As discussed at the beginning of page 7, this is only resembled by the highly pollution sites as Ispra, Mexico City and GSFC. Rome, Kanpur and Beijing are mainly comparable in terms of coarse particle effects. We will specify "In terms of coarse particle effects..." before the sentence indicated by the reviewer.

Referee#1: on page three the end of the introduction a new parameter, the extinction fraction is introduced. This parameter is later on given as the ratio of fine to total using a greek character. It would be better to introduce this character the first time this parameter is used to avoid confusion during reading. on page 4 this ratio (extinction fraction) is given as 1 - 99%. a ratio should be 0-1.

Authors reply: We shall introduce the greek character eta at the end of the introduction (page 3) as the "fine mode fractional contribution to total AOT". In the following text we will use the term "fraction" instead of "ratio".

Referee#1: minor comments/recommendations section 3, Application to Aeronet data first paragraph, line 15, ...superimpose their signal on the pollution one? (signature) in Beijing and Kampur line 21, ... what we see in figure 3 instead of in the figure line 22,

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... , into a larger size of the fine mode and a fine fraction... Page 8, line 12. , ... while confirming the absence of a significant contribution of dust at the Ispra site...

Authors reply: We shall insert all these minor changes in the manuscript.

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

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Interactive Comment