

## ***Interactive comment on “A review of biomass burning emissions part III: intensive optical properties of biomass burning particles” by J. S. Reid et al.***

### **Anonymous Referee #1**

Received and published: 19 October 2004

The paper represents a review of the optical properties of biomass burning aerosol. It reviews the existing methods for determining the radiative properties of atmospheric aerosols; bulk parameterization from measurements, forward calculations based on particle size distribution and chemistry, inversions of remote sensing data. Recommendations are given what optical properties should be used as representative for biomass burning aerosol.

The paper is a very useful review not only for experts in the field but also for anybody who is interested in what is known about the optical properties of biomass burning aerosol. The authors shed some light on the degeneracy problems in “closure” calculations and mentioned the fact that the wavelength dependence of the aerosol extinc-

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tion usually deviates significantly from the Ångstrom power law. Both points are often not discussed in this clarity or even lacking in the literature. The results and conclusions are presented in a clear, concise, and structured way.

After the revision of some minor points listed below I strongly recommend the paper for publication in ACPD.

## Specific Comments

### *Section 2*

Particle non-sphericity is an important issue in discussing the optical properties of atmospheric particles and should be discussed somewhere in this section. Especially the wavelength dependence and the backscattering ratio might be of concern in this respect.

Page 5216, Line 11-12: It is not clear for me why there should be a theoretical limit for the single scattering albedo.

## Technical Corrections

### *General*

For the reader it might be confusing when using the same symbol ( $\alpha$ ) for the mass (scattering) absorption efficiency as well as for the Ångstrom exponent. Even in awareness that this is in consequence of scientific history, a second symbol should be introduced for clarity.

Check that there is a blank before and after each dash in the text

### *Specific*

Page 5207, equation 4: Ångstrom parameterization is printed twice

Page 5211, equation 6:  $\mu$  and  $P$  are not defined

Page 5223, line 7: Insert 'in' after 'differences'

Page 5231, line 5: write 'due to' instead of 'to due'

Page 5231, line 13 and page 5232, line 4: use the unit  $g/cm^3$  for the density instead of  $m^2/g$

Page 5251, caption of table 1: use  $\alpha_a$  instead of  $\alpha_s$

Page 5256, table 4: It might be more illustrative to give here the Ångstrom exponents according to Eq. 5

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 5201, 2004.

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