REVIEW OF

H. Moosmüller and R. K. Chakrabarty
Technical Note: Simple analytical relationships between Ångström coefficients of aerosol extinction, scattering, absorption, and single scattering albedo, *Atmos. Chem. Phys. Discuss.*, **11**, 19213–19222, 2011

GENERAL

The paper presents just what its title promises, simple relationships between Ångström coefficients. I liked reading the text. The derivation of the relationships was straightforward, I did not have to guess how something was done like in some other papers. I am sure the relationships will prove to useful, and as far as I know nobody has presented them before. So it is obvious that I will recommend publishing this in ACP. I didn't find any errors, I just have some fairly minor comments and suggestions.

DETAILED COMMENTS

In equations 1b and 1c you give two different ways of getting the AC. Why wouldn't you also mention that it can also be obtained from multiple-wavelength data by taking logarithms on scattering (or absorption or extinction) and the wavelengths and fitting a line; the slope gives the AC.

P19217, L3: "... SSCA (ϖ) ..."; P19217, L4: "... SSA (ω) ..."; P19217, L11: "... SSA $\omega(\lambda)$ ...".
P19217, L11, "... SSA $\omega(\lambda)$ ...".
Why don't you use just ω and ϖ, you have defined both of them already earlier.

P19217, L12. Why don't you give the "$EAC(\lambda) = AAC + \omega(\lambda) [SAC - AAC]$" an equation number, 2g?

I feel that section 3 "Generalization to two-wavelength Ångström coefficients" is somewhat unconnected to the rest of the paper, all equations before and after it are clear without it. And what is the physical meaning of a two-wavelength SSA? You write that it is a weighted average of the SSAs at the two wavelengths. Weighted by what? To me it seems just a mathematical construction, you could just as well define an n-wavelength SSA but what would it mean? Please clarify this a bit. Also in the same section you write about the symmetries (P19218, L4-9). What would these mean in practice, what is the purpose of discussing these symmetries?

P19218, L10-12: "Using Eqs. (3a, b), as definitions of two-wavelength SSA and SSCA, Eqs. (2h), (4d), and (5) can be used for two-wavelength Ångström coefficients by replacing all occurrences of (λ) with (λ_1, λ_2)." Well, if the AC has been calculated from 3 or more wavelengths by fitting a line to logarithmized data, how then?

You are creating here new nomenclature so I suggest you once more think through the symbols. SSCAAC is quite a long symbol for one quantity. Have you considered using α for AC, like a few other authors, and using a subscript for the various versions of AC? Then you would have shorter symbols, for instance α_ϖ for SSCAAC and α_ω for SSAAC. At least I would consider this more compact.

And still about terminology: I did a simple opinion poll using scholar.google:
Ångström exponent: 2190 hits
Ångström coefficient: 783 hits
Ångström parameter: 331 hits
There seems to be no consensus – which is in line with so many of the symbols used in aerosol optics. I am for the "exponent".

Anyway, in general I liked this paper.