

Interactive comment on “Verification and application of the extended Spectral Deconvolution Algorithm (SDA⁺) methodology to estimate aerosol fine and coarse mode extinction coefficients in the marine boundary layer” by K. C. Kaku et al.

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General comments

The paper “Verification and application of the extended Spectral Deconvolution Algorithm (SDA⁺) methodology to estimate aerosol fine and coarse mode extinction coefficients in the marine boundary layer” by K. Kaku et al., describes a method to separate

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the fine and coarse mode aerosol particles from the measured total aerosol optical properties. This method is not new but until now its use has been limited to columnar measurements, such as the aerosol optical depth. In this work, the same methodology is successfully applied to in situ measurements of absorption and scattering coefficients, for which the Ångström exponents have been traditionally used for the same propose.

The first part of the paper presents the theoretical basis of the classical Ångström exponents method as well as the basis of the SDA+ methodology. Both methods were applied to two data sets and the correlation between both is presented. The paper follows with the application of the proposed methodology to several data sets covering several aerosol conditions, from clean marine to pollution, dust, etc. The applicability to two of these data sets is examined in detail.

The paper is adequate for the journal scope, it is well written, well structured and the subject is a useful contribution, so it deserves publication.

Specific comments and technical corrections

pag.2555, line 13: "R/V" - research vessel?

pag.2559, last paragraph: DMPS and APS, please include what these stand for, Differential Mobility Particle Sizer and Aerodynamic Particle Sizer;

Fig.1, caption: "derivitive" should be "derivative";

Fig.2, Fig.6, Fig.7 and Fig.8: The SDA+ data symbols override the measured data symbols. You can bring the measured symbols to the foreground and use stronger colors;

Fig.2, Fig.6, Fig.8: absorption values are so small that the extinction and the scattering data are almost identical. As a consequence, fig.2a looks almost the same as fig.2b and fig.2c and fig.2d are also identical. The same happens with figures 7a,b,c,d and 8a,b,c,d. Maybe the scattering figures can be presented as supplementary material

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and also the respective absorption values. It is true that the absorption data is to be interpreted in a different way but it can also be presented as supplementary material.

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