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Interactive comment on “A new algorithm for brown and black carbon identification and organic carbon detection in fine atmospheric aerosols by a multi-wavelength Aethalometer” by F. Esposito et al.

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Dear Authors,

the use of the absorption Angstrom exponent to discriminate between sources of combustion have been used in the past, most exhaustively for discrimination of fossil fuel and biomass combustion in Sandradewi (2008) and Favez (2010). The Angstrom exponent specific to the type of fuel combustion is used to apportion the absorption and then BC to one source or the other. The wavelength dependence of absorption has

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also been used to identify Saharan dust events (Collaud Coen 2004, Fialho 2005).

The methodology that Esposito et al. use is slightly awkward. The increase of the Angstrom exponent for absorbing aerosols is exactly due to the increased absorption at low wavelengths. This may be operationally defined as UV absorbing particulate matter (UVPM) or as brown carbon (BrC) or as absorbing OC. I believe the method of extrapolating absorption to blue and then attributing the increased absorption in the UV is methodologically weak. The Angstrom exponent changes with the wavelength (Moosmueller 2011). Attributing this to operationally defined substances is somewhat arbitrary: how do we differentiate between BrC and absorbing OC?

Converting the Aethalometer measurements of mass absorption to absorption coefficient and deriving its wavelength dependence has been shown as a very useful tool for source apportionment. Calculation of the absorption and SSA Angstrom exponent does identify the episodes with aerosol from various regions. The authors may wish to use the wealth of data they have and clarify and simplify their methodology to process it.

Kindest regards, Grisa Mocnik

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