

Interactive comment on “Black carbon or brown carbon? The nature of light-absorbing carbonaceous aerosols” by M. O. Andreae and A. Gelencsér

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The authors show very convincingly how light absorbing carbon compounds (named “brown carbon” by the authors) may bias measurements of “black carbon” and “elemental carbon” in the troposphere.

We would like to point out, that in addition to heterogeneous reactions of dienes like isoprene in the presence of sulfuric acid [Limbeck et al., 2003], a wide range of different organic matter reacting in $\text{H}_2\text{SO}_4/\text{H}_2\text{O}$ solutions of composition comparable to acidic aerosol particles under dry conditions induces absorption over the whole visible part

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of the spectrum [Hegglin et al., (2002)]. This absorption was associated with a strong fluorescent signal, which could be excited as far in the red as 633 nm. Therefore, using fluorescence (even with excitation in the green to red part of the visible spectrum) may provide a supplementary tool to characterize "brown carbon" containing aerosol in the atmosphere. A first exciting step in this direction has been made by Immler et al., (2005) by detecting a fluorescent signal from an ambient aerosol layer in the lower stratosphere using a water vapour Raman channel of their LIDAR system.

References:

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