

Interactive comment on “Spectral dependence of aerosol light absorption over the Amazon Basin” by L. V. Rizzo et al.

Anonymous Referee #2

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The authors present results of three field campaigns at different sites and seasons in the Amazon Basin. The authors derive absorption coefficients and the wavelength dependence of absorption coefficients (Ångström exponents). These values are valuable for the scientific community.

The reviewer recommends to accept the manuscript for publication with subject to minor revision.

Specific comments

The authors suggest to measure the spectral absorption from the UV to near IR (c.f. page 11564, lines 21 to 32). The Aethalometer AE30 measures from 450 to 950 nm. Other types (e.g. AE-31) measure from 370 nm to 950 nm. Is there any indication

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that the extension of the spectral range down to wavelength of 370 nm improves the information content of absorption measurements?

Page 11548, line 20 and page 11564, lines 13 to 15: Low absorption coefficients are correlated with low Ångström exponents (<1). The authors's explanation is that biogenic aerosols from the Amazonian have a weak spectral dependence. The authors should support their thesis by an error analysis for these cases. How high are absorption coefficients compared to the detection limit? Please give values for the uncertainty of the Ångström exponent.

Page 11554, line 1: should be “ Δ ATN” ?

Page 11554, line 13: there might be a typo in “Eqs. (4) to (2.5)”

Page 11555, line 12: Was the value of 20% calculated from Eqn. 8? Which ATN corresponds to this value.

Page 11555, line 23: Is it valid to use values for m_s and C from Arnott et al. (2005)? To my knowledge in Arnott et al. (2005) no biomass burning or biological particles were investigated. Can the authors comment on that?

Page 11557, lines 16 to 18: The authors derived factors for the conversion of attenuation to absorption coefficients. I think the authors should compare their conversion factors to values given in the literature, e.g. Collaud Coen et al. (2010).

Page 11559 line 3: The worst case error is given to be 25 %. Does this worst case error explain the contradicting expectation discussed in the abstract (page 11548, line 22) and on page 11561, line 14.

Page 11560 line 2: “ dm^3 ” is that a typo?

Page 11560 line 5: Can the authors explain how the detection limit was determined?

Figures 2 and 4: Typos in the vertical axis title “Mm-1”

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Figure 5,4,6,3: Typos in the horizontal axis title "angstrom"

References: Collaud Coen, M., et al. (2010). "Minimizing light absorption measurement artifacts of the Aethalometer: evaluation of five correction algorithms." *Atmospheric measurements techniques*.

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