

Interactive comment on “Brown carbon absorption in the red and near infrared spectral region” by András Hoffer et al.

Anonymous Referee #3

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This paper presents the wavelength dependence of the absorption Angstrom exponent and complex refractive index of laboratory generated tar balls from two wood types. The retrieved values cover the 467–959 nm wavelength range extending previous published values to the nIR region. The results are novel and of interest for atmospheric modeling and therefore within the scope of AMT. I recommend the publication in AMT after the following issues has been addressed:

Specific comments

1. According to the manuscript, the Continuous Light Absorption Photometer (@ 467 nm, 528 nm, and 652) and aethalometer (@880 and 950 nm) provide the wavelength dependence of the absorption coefficient. Scattering coefficients are measured by a TSI 3563 nephelometer at 450, 550, and 700 nm but they are not provided in the paper.

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Please, include those data. Does it mean that the scattering coefficients of the tar balls are not measured at 880 and 950 nm but only the absorption coefficients? Please, specify this point.

2. Page 5, lines 5-10:

‘ In order to address the measurement uncertainties nigrozin particles were generated and measured with the same setup used for tar ball measurements. The measured absorption and scattering coefficients at 652 and 633 nm, respectively, were compared with those calculated using the size distribution and the index of refraction of nigrozin at 633 nm wavelength (Pinnick et al., 1973). ‘

How is the scattering coefficient (633 nm) of nigrozin particles measured? According to page 3, lines 18-20, the TSI 3563 nephelometer provides scattering coefficients at 450, 550, and 700 nm. Is it measured by another instrument?

3. Page 5, lines 10-13:

“The obtained correction factors were applied for the measured scattering and absorption coefficients of tar balls, which together with the size distribution served as input parameters for the inverse Mie calculations (Guyon et al., 2003). ‘

It is mentioned that the uncertainties in the measured absorption coefficients are around 25%. Are the obtained corrections factors within the estimated 25% error? Please, provide the correction factors. Those values are needed to have an indication of the accuracy of the measured values.

4. Page 5, lines 14-15.

“It was assumed that the same correction factors apply for the other wavelengths as well. For the calculations the absorption and scattering coefficient were extrapolated to the given wavelength, if it was necessary.”

It should be clearly stated which refractive indices are obtained from the measured

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scattering and absorption coefficients and which from extrapolated values. In the extrapolation procedure you are assuming a linear dependence on the scattering and absorption coefficients with the wavelength. Is that correct? Please, specify.

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