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Interactive comment on "A new approach for measuring the UV-Vis optical properties of ambient aerosols" *by* Nir Bluvshtein et al.

Anonymous Referee #5

Received and published: 2 May 2016

General comments:

This nicely written paper outlines the use of a combination of measurements of aerosol optical properties to retrieve continuous, spectrally dependent absorption, scattering, total extinction and complex refractive index over the atmospherically relevant range 300-650 nm. The novel combination of instruments and the novel retrieval algorithm make this paper easily suitable for AMT.

As the now fourth reviewer on this paper, I largely concur with the comments of the three reviews already posted, which will improve the presentation, and I will keep my own comments brief. I specifically endorse comments of referee #3 with respect to error analysis.

Specific Comments:

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Discussion paper

Page 6, line 24-26. The use of a power law for the alpha_abs seems specifically designed to capture brown carbon. What would the appropriate spectral dependence be for black carbon if that were the only absorbing component, and would the power low represent black carbon well in that situation?

Page 9, section 3.1 and Figure 5. A few questions / comments. 1) The relative errors are large in extinction due to absorption (and in imaginary refractive index) and small in extinction due to scattering and in total extinction (and real refractive index). One would guess that large errors in absorption would translate directly into large errors in SSA, which is directly proportional to absorption, yet errors in SSA are much smaller. Some explanation is warranted. 2) Relative errors are given with no indication of the sign of the errors. Does this analysis reveal any systematic deviation, or are the errors simply distributed about zero? 3) If I understand this procedure correctly, the measured values are assigned to the correct value in the synthetic data for the purpose of testing the retrieval. Please correct if I have misunderstood. What would be the effect and / or additional error in the retrieval if measurement uncertainty were considered (i.e., measurements assigned to values different from the synthetic data according to the measurement uncertainty distribution)?

Page 10, line 6-7: Wouldn't one expect agreement between the measurement and retrievals at the single wavelength to which the aerosol absorption is constrained in the retrieval? Suggest adding the phrase "as expected" or equivalent to indicate this.

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