

Interactive comment on “Design and performance of a three-wavelength LED-based total scatter and backscatter integrating nephelometer” by T. Müller et al.

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I submitted a number of comments directly to the authors on September 9, and feel that they should be repeated in this open forum. Only one of those comments, concerning the title, has been addressed to my satisfaction in the version published on AMTD.

An additional comment... the TSI neph is referred to as model 3565 in several places in the text, whereas the correct model number is 3563.

An a comment on a point that Darrel raised in his review... the light source in the Radiance Research neph uses a flash lamp, not an LED.

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— earlier comments —

- I suggest that you include a disclaimer concerning the presence or absence of financial support from Ecotech for doing the work at IFT.

- the paper is much more about the performance of the neph, rather than its development. You could remove "Development and" from the title and not lose anything.

- Table 3 in Anderson & Ogren gives the measured noise of 7 TSI nephs on filtered air, which is the same approach as you used in section 4.1. When you discuss noise in the Ecotech neph, though, I think that you need to include the settings of the internal Kalman filter when you did the measurement.

- You should be able to do a closure calculation with the ammonium sulfate lab tests. I have found over the years that the closure results in the TSI neph characterization paper are a really simple and convincing way to demonstrate to an audience that the instrument really works as we think it does. I suggest that you include a closure calculation in your paper, which would include your measured angular and wavelength response functions.

- Ecotech neph users are going to be knocking down your doors for a simplified correction scheme for truncation/illumination errors. It would be very useful if you would evaluate the feasibility of the Anderson&Ogren scheme for estimating the correction factors for the Ecotech neph using the measured Ångström exponents. If the approach is feasible, I suggest including the parameters for the correction equations in your paper.

- Finally, I think that neph users would find it useful if you reported a few other measured characteristics of the Ecotech neph compared with the TSI neph: – temperature rise of the sample air, and resulting RH reduction; – wavelength distribution of the light source; – effective volume (c.f., Bergin et al, ES&T, 1997); – response time (with and without the Kalman filter).

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