

## ***Interactive comment on “Validation of UV-visible aerosol optical thickness retrieved from spectroradiometer measurements” by C. Brogniez et al.***

**C. Brogniez et al.**

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Answer to Short comment

Dear Stelios,

Thanks for you kind comments and suggestions to improve the paper.

- a. A major issue for ground based AOT monitoring instruments is the cloud detection. Since the measurement of AOT with this (shadowband technique) instrument requires at least half an hour (for two diffuse and one global measurement), what is your methodology of detecting cloud effects during this period ?

Reply: Close to the spectroradiometer we operate a YES UVB-1 radiometer delivering

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routine measurements with a 3-min period, so we can detect any fast variability of the irradiance related to cloud presence. Moreover in the AERONET/PHOTONS processing there are also analyses performed on almucantar measurements to determine if clouds are present or not. We agree that such info is useful, so we have added in the text a short explanation about that.

b. Fraunhofer lines seen in figure 2 can be an effect of the wavelength dependent slit function (in combination with the wavelength shift correction).

Reply: The spectroradiometer slit function has been measured in lab with a laser at 2 wavelengths: 351.1 and 457.9 nm. The 2 slit functions were very close, so we use a mean slit function in the whole wavelength range. We agree that it can introduce oscillations but we don't have measurements of the slit function at many wavelengths in the 280-450 nm range.

c. In the uncertainty analysis you are referring to a relative uncertainty for the  $E(\text{dir})$  (1.5%) (formula 4). The instrument calibration is based on lamp measurements and you are using an ET spectrum for the AOT retrieval. Both global and diffuse measurements (and their subtraction) are affected from measurement, calibration etc uncertainties. In addition to those introduced by the direct changing "field of view" (wavelength, solar zenith angle and aerosol dependent), the assumption of aerosol stability and cloud absence during the half hour period and synchronization with the CIMEL.

Reply: We are not sure that we understand what you mean. 1.5% is the relative uncertainty on the ET spectrum, not on the  $E(\text{dir})$  measurement. In the spectroradiometer AOT uncertainty analysis we think that we have forgotten nothing. Concerning the sunphotometer AOT we have given the "official" uncertainty in Table 1. As said in the reply to your question a/, the spectro AOT corresponds to measurements over about 30 min, so it is like a mean AOT. The sunphotometer's AOT is an average of values obtained during the period of the 3 spectra, the uncertainty reported in Fig 3 (and Fig 7) accounts for the variability and for the official uncertainty.

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d.Qasume results have been published by Groebner et al., 2006- metrologia 43, 866-871.

Reply: Thanks, we have given now this reference in the text.

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Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3895, 2008.

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8, S3036–S3038, 2008

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