

***Interactive comment on “Airborne sunphotometer
PLASMA: concept, measurements, comparison of
aerosol extinction vertical profile with lidar” by
Y. Karol et al.***

Anonymous Referee #1

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The paper presents first ground-based and airborne results from a newly developed airborne filter-based sun photometer.

The problem I see with the manuscript is that it not very rigorous as discussed below.

The manuscript also needs substantial improvement in terms of language. Numerous sentences are unclear, grammatically incorrect or incomplete. One of many examples is line 5 p. 6821

Comparisons to a ground-based lidar and ground-based sunphotometers are discussed briefly. Overall the agreement is very nice and the vertical profiles of AOD
C2400

and derived extinctions are very smooth.

A discussion on how the lidar extinction profiles are measured and derived however is entirely missing and needs to be added.

A huge amount of insight into airborne sun photometry has been gained by the team at NASA Ames with over 100 papers published. That work is mentioned only tangentially, in one instance to point out that that the spectral coverage of PLASMA is better than that of AATS-14. While strictly this is true, the authors totally neglect to point out areas where heir instrument is less rigorous.

1) PLASMA uses a filter wheel. AATS-14 has 14 channles that measure in parallel. How fast can a PLASMA spectrum be obtained? How much distance does the aircraft cover in that time?

2) PLASMA is not temperature stabilized. AATS-14 is. The authors claim (6816 line 14) that PLASMA is insensitive to temperature changes. This can't be right as Si and InGas photodiodes have temperature sensitivities that vary accross the spectrum of incident light. See for instance figure 5 of <http://www.centronic.co.uk/downloads/3-1-6%20photodiode%20theory.pdf>

p. 6814 The accuracy claimed in AOD is impressive. The authors should note though that a one time intercomparison is no indication of the overall stability of the instrument given the typical degradation of filters, which the authors mention without any specifics (needs to be added to the manuscript).

p. 6820. Disagreement at 343 nm is blamed on gaseous absorption? What do the authors mean here? What is the O₃ OD at that wavelength, what O₃ columns were assumed for either instrument?

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 6813, 2012.