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Atmospheric Measurement Techniques Discussions

Interactive comment on "Retrieval of aerosol optical depth in the visible range with a Brewer spectrophotometer in Athens" *by* H. Diémoz et al.

Anonymous Referee #1

Received and published: 9 February 2016

GENERAL COMMENT:

The paper describes a new technique to retrieve aerosol optical depth in the visible using a Brewer spectrophotometer and, as such, the paper is well within the scope of AMT. It is obvious that the authors have a very good knowledge of the instrument and related technical issues. The paper is very well written and the conclusions are formulated in a clear way. This study is very valuable for researchers who want to retrieve AOD with their Brewer instrument(s).

SPECIFIC COMMENTS:

Page 9, line 5-6: You mention a trend in the difference between AODs from the Brewer and the Cimel of 0.003 per year. Please specify whether the trend is statistically significant. If it is not, I would not mention this as it has no added value here. If it is

significant, can you explain what causes this trend (i.e. changes in the Brewer AOD or in the Cimel AOD)?

Page 10, line 6: Why must the average AOD during the day be lower than 0.4? How did you decide to use this value?

Page 14, line 21: What is the "Chauvenet" criterion? Please explain or add a reference.

Page 16, lines 12-14: I am not quite sure if you should include this as the link between the PCA mode and PWV seems very weak. Also, as it is mode 6, I guess its added value in explaining the observed variation is very small?

Page 16, line 28: Can you please explain what you mean with the following sentence? 'For the same reason, the effects of finite bandwidth due to the breakdown of Bounguer-Lambert-Beer law do not relevantly affect AOD measurements in the visible range.'

Figure 5: There does not seem to be a trend in the ETC, however there does seem to be a drop in the ETC after 2011 (after a period without ETC values). Was this a calibration period of the CIMEL? Can this cause a change in ETC?

TECHNICAL CORRECTIONS:

I suggest the following corrections:

Page 2, line 32: '. . . about 80 MkIV Brewer spectrophotometer ...' => spectrophotometers

Page 5, line 22: 'which 170 nearly simultaneous (i.e. within +/- 1 minutes) to the Cimel' => Replace with 'which 170 nearly simultaneously (i.e. within +/- 1 minute) with the Cimel'

Page 6, line 3: '. . . as similar as . . .' => Replace with 'similar to'

Page 6, line 10: '. . . consisting in the subtraction . . .' => Replace with 'consisting of'

Page 6, line 28: 'Alternatively, pressure measured at . . .' => Replace with 'Alternatively,

the pressure measured at . . .'

Page 9, line 27: 'This criteria . . .' => Replace with 'criterion'

Page 11, line 14 and Page 11, line 26: 'is to ascribe to' => Replace with 'is to be ascribed to' or 'can be ascribed to' (depending on how certain you are that the described effect is the reason for what you observe)

Page 14, line 18: 'were loosen' => Replace with 'were loosened'

Page 14, line 28: 'each neutral density filters' =>Replace with 'filter'

Page 16, line 4: 'consisting in' => Replace with 'consisting of'

Page 16, line 13: 'only modest correlation is found' => Replace with 'only a modest correlation is found'

Page 16, line 28: 'Bounguer-Lambert-Beer law' => Replace with 'Bouguer-Lambert-Beer law'

Figure 2, caption X-axis: T (C) => Replace with 'T (°C)'

Figure 10, caption: '. . .on extraterrestrial constant' => Replace with '. . .on extraterrestrial constants'

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