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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "Relevance of a kite-based calibration for a water vapour Raman lidar" *by* J. Totems and P. Chazette

**J. Totems and P. Chazette**

julien.totems@lsce.ipsl.fr

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(ADDITIONAL COMMENT: As a follow on to my previous comment, may I suggest that the authors have a look at the following publications and references therein, in order that they can attempt to comment the result on the -28% bias of Aeronet within context? It is true that studying Aeronet was not the authors' initial goal, but as they have found a bias I believe that it could be worth it to put this result into a wider context. Ortiz de Galisteo et al., 2010, Mavromatakis et al., 2007, Martinez-Lozano et al., 2007, Estelles et al., 2007, Torres et al., 2009.)

These interesting references show various occurrences of bias between sunphotometer (both Cimel and Microtops) and GPS/RS data. The last one is the most complete



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in estimating ∼0.2 cm of RMS difference between sunphotomer and GPS over a long period (∼4 years), with a possible drift along time, which varies with the Cimel sunphotometer used. It can either be positive (humid) or negative (dry). This seems to point towards a probable effect of variabilities of components or calibration process. However, Mavromatakis et al. show that out-of-band filter transmittance could cause only 5% error. Moreover these observed differences are much lower than the ∼1 cm difference observed during ADRIMED, which seems rather due to a saturation phenomenon than a consistent bias, as it appears mostly for PWV > 2.5 cm. Although we can refer to this rather complete collection of work on the subject, thanks to the reviewer, it should only be to point out that the error we observe is outstandingly large, as was done in the previous version of our manuscript; we did not find any plausible explanation in these references. The French PI of AERONET, Dr. Philip Goloub at LOA, was not able to provide us with one. We modified the paragraph of the conclusion discussing this point as follows: While several previous studies have warned about a slight dry bias (Pérez-Ramirez et al., 2014) or wet/dry biases and drifts below 0.3 cm depending on the Cimel sunphotometer used (Torres at al., 2009), this much stronger effect (up to 1 cm) has not been reported elsewhere, to our knowledge, despite multiple works on the subject (Mavromatakis et al., 2007, Martinez-Lozano et al., 2007, Estelles et al., 2007, Ortiz de Galisteo et al., 2010).

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Interactive comment on Atmos. Meas. Tech. Discuss., 8, 10577, 2015.