Atmospheric
Measurement
Techniques

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Discussions

Interactive comment on "Calibration of Raman lidar water vapor profiles by means of AERONET photometer observations and GDAS meteorological data" *by* Guangyao Dai et al.

Anonymous Referee #1

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General comments

The paper by Dai et al. (2017) presents a practical method to continuously calibrate Raman lidar observations of the water vapor mixing ratio. The lidar is calibrated by means of collocated AERONET sun photometer observations and Global Data and Assimilation System (GDAS) temperature and pressure profiles. The applied data was collected during CyCARE in Limassol, Cyprus.

The publication is well written and to the point. It represents a valuable contribution to the community. However, I recommend some changes to improve the manuscript. The distance between the numbers and the unit doesn't seem to be a half and protected

space in most cases, especially in the abstract. In some formulas the typesetting is wrong, especially the subscript 'R' in Eq. (1). A more detailed description on limitations and uncertainties of the proposed method would be very useful to highlight the estimation of the benefit of the calibration scheme.

The topic of this publication is within the scope of AMT and I recommend publication after integrating the corrections.

Specific comments

P1L3: Here you write 'co-located' and in P2L13 you write 'collocated'. Be consistent.

P1L9-10: Space between number and unit is not half and protected.

P1L16: Here you write 'good accuracy'. Please quantify!

P1L18-21: Please rephrase this paragraph to make it more fluently.

P1L19: Typo in relative humidity.

P2L9: I suggest to use 'regularly' instead of 'time to time'

P2L13: 'collocated' or 'co-located'. Be consistent.

P3L19-23: The description of the measurement site could also be a subsection in the beginning of section 2 or an introduction of section 2.

P4L5-11: Please check the subscript 'R'. It should be upright.

P4L18: Omit 'And' and start with 'The WVMR . . .'.

P4L25: I believe you mean the ratio and not the total difference. Please clarify!

P5L13-22: In my opinion your conclusion here is a bit extreme. As I understand you show the difference on one single day. The expressiveness of this comparison for a general statement is quite low. I suggest to show a small comparison of a couple of launches and to use the bias and rmse as quantities to estimate the uncertainties of

the GDAS data referred to RS profiles.

P5L15: The radiosonde is given by a green dashed line and not by a blue dashed line.

P6L16: Please don't break the line between numbers and units. Use a half and pro-tected space.

P6L16: You write relative difference but the amount is in absolute values. Please change the amount to a relative quantity.

P6L27: 'collocated' or 'co-located'. Be consistent. Omit 'of' before 'sun photometer'.

P7L3: Here you start using multiplication symbols in the unit. Please Omit the dots.

P7L15-16: Please check the space between numbers and units. Use half protected spaces.

P7L18: Please add relative uncertainties.

P7L29: Please check the space between numbers and units. Use half protected spaces.

P8L10: Change 'signals' to 'signal'. Omit the comma after 'Fig10(b)'.

P8L11: Please check the space between numbers and units. Use half protected spaces.

P8L27: Here you write 'typically'. Does it mean that you have the numbers from your data analysis? If not please give a reference. Please clarify.

P9L8: Please add a relative uncertainty.

All Figures: Please add minor ticks to your figures. It makes it much easier to read your figures.

Fig.3: What are the blue dotted lines? Please clarify.

C3