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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Scanning rotational Raman lidar at 355 nm for the measurement of tropospheric temperature fields" *by* M. Radlach et al.

Anonymous Referee #2

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Reviewer's commnet

Scanning rotational Raman lidar at 355 nm for the measurement of tropospheric temperature fields by Radlach et al.

This paper reports development of a rotational Raman lidar for temperature measurement using the third harmonics of the Nd:YAG laser with a capability of spatial scanning. This lidar with 355 nm wavelength have an advantage of both eye-safe and daytime operation compared with the past system with 532 nm wavelength using the novel technology of UV interference filters. Overall quality of the presentation is good and I recommend publication in ACM, after a minor revision for the following points.

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1. Section 2 (System setup). What is the specification of telescope? Diameter? Focal length? etc.

2. Section 3 (Filter optimization), P. 7575 L. 8. "we used a modified Gaussian curves with very steep edges and an idealized transmittion of 100 % to extract....". I do not understand this description. Please explan more about the fitler transmission characteristics.

3. Section 3, P.7575 L.28 - 29. What is the definition of delta-lambda-FWHM1 and FMHM2? Are they of IF 2 and 3 or IF 2a and 2b?

4. Section 3, P.7575 L. 26. What is delta-T?

5. Section 3, P. 7576 L.8 "7 orders of magnitude" Does this include IF1?

6. Section 3, P.7576 L.14 What is T1 and T2?

7. Section 4, P. 7578 L.18-20 It is strange to me that all the radiosonde data is within 1-sigma of lidar measurement, because usually 1-sigma means about 70 % of the data are within this limit (if this is 2-sigma, 95 %). If there is 10 independent observation points (heights), 3 of them are expected out of 1-sigma limit. Are you overestimating the 1-sigma error?

8. P. 7581 L. 6-7 and table 3. In contrast, table 3 shows larger difference between lidar and radiosonde. At Scan 6 and 9, the difference is about 3 sigma and 2.3 sigma, respectively, They should be a rare case since there are only 5 comparisons. I suspect the difference between the two measurement is large, and there might be some factor of increasing error when lidar beam is scanned. The distance between the lidar and sonde may not be a problem because this is of the same order witj the above case (7. Section 4, P.7578 L.18-20). I request some comment on it in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 7569, 2007.

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Interactive Comment