

Field deployable diode-laser-based differential absorption lidar (DIAL) for profiling water vapor,

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General Remarks

The manuscript describes design and testing of an autonomous water-vapour lidar system. The manuscript is interesting and deserves publication. However, a number of improvements should be considered before an acceptance for AMT:

Details

- (1) P. 11268, line 15: add "and a much better daytime capability". This is a key advantage with respect to Raman lidar systems.
- (2) P. 11268, lines 18-26 and further below: Bösenberg and Linné demonstrated autonomous operation around the clock and around the year, Vogelmann and Trickl wide-range daytime measurements. What is new is the achievement of all this for a micropulse lidar with a substantially lower pulse energy! This is the most important achievement and should be described clearer.
- (3) P. 11271, line 4, Table 1: The spectral purity should be specified and related to values prescribed in the literature (e.g., in line 11).
- (4) P. 11271, lines 8, 11, 19: Specify manufacturers, also elsewhere in the paper.
- (5) P. 11272, line 12: Here, the importance of the spectral purity is mentioned, but no value was given.
- (6) Sec. 2.2: On P. 11270, line 8, it was claimed that the set-up is unique. This is not clearly explained in Sec. 2.2. To my knowledge neither the concentric arrangement of telescope nor this kind of beam expansion is new. There is even an enhanced danger of excessive near-field scattered light. A much wider beam could be produced with a biaxial system.
- (7) P. 11273, line 23: Achieving eye-safe operation is a considerable task in the near infrared. This could be mentioned as an introductory remark.
- (8) P. 11274-11275: Specify the manufacturers.
- (9) P. 11278, line 11: Use r' and dr' instead of r and dr in the integral of Eq. 3.
- (10) P. 11281, lines 14-17: Why was just one line corrected? This is not clearly explained and must be guessed from the following sentence. Did the HITRAN 2008 cross sections differ from those published in 2000? This has been observed in other spectral regions.
- (11) P. 11281, lines 26-29: "Therefore, an important goal of this research effort was to demonstrate a next-generation instrument ..." is already known and unnecessary to repeat. I suggest: "Therefore, an important goal of this research effort was to demonstrate that the next-generation instrument was, indeed, capable ...". The improvements were already described!!!!
- (12) P. 11282, line 24: What is the sonde type and accuracy? This is an important issue because of the known differences in quality.

Style:

- (1) P. 11266, line 24: "to continuously measure" is a split infinitive and should be avoided.
- (2) P. 11268, line 2: "Raman lidar typically require": "requires"?
- (3) P. 11268, line 21: Change to "However, ..."
- (4) P. 11269, line 7: Specify MEMS
- (5) P. 11275, lines 14, 17 and 21, P. 11276, line 2, Fig. 3, lines 3 and 5: Replace °C by K.
- (6) P. 11276, lines 20-21: I suggest writing "dependence. Therefore, the ..."
- (7) P. 11277, line 21: Change to "However, the".
- (8) P. 11277: line 22: Change to "programmed".
- (9) P. 11281, line 18: See (8).
- (10) P. 11283, line 3: Use "about" (twice).
- (11) P. 11284, lines 1-2: Perhaps better: "for distances between 0 and 14 km".
- (12) P. 11286, line 1: "reliability suggest"