

## ***Interactive comment on “Measurements of Humidity in the Atmosphere and Validation Experiments (MOHAVE)-2009: overview of campaign operations and results” by T. Leblanc et al.***

**Anonymous Referee #1**

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### General

The paper presents an overview of the MOHAVE-2009 experiment. The participating instruments are introduced, the campaign strategy is explained, and the most important comparison results are discussed. The paper is well written and can be published after minor revision.

### Specific comments

C1222

1. It would be very helpful for the reader, if Section 2 could be complemented with a table that lists the participating instruments by type. The table should summarize the names of the instruments (with abbreviations), important specifications, and references where further information can be found (with specific focus on the special issue). Such a table would especially be helpful to follow the discussion of results in Section 4.
2. The altitude of the experimental site should be explicitly given in the beginning of the paper (introduction). Consequences for the campaign results should be discussed in the relevant places (e.g. when conclusions on lidar measurement heights are drawn), not only in the context of Fig. 14.
3. The discussion on the number of lidars used in the campaign is a bit confusing, especially with respect to the AT lidar (what does AT mean?), see abstract (three Raman lidars), introduction (four Raman lidars), and end of Section 2.3 (according to the second-last paragraph the system did not measure during the campaign, but two sentences later it is said that it measured temperature. . .).
4. Check the wording when discussing the STROZ operating modes (page 3287, e.g., “First an ozone mode. . .” is not a complete sentence; “the second mode transmitted only 355 nm”. . . makes no sense).
5. The last sentence of Section 2.7 is unclear.
6. Section 3.1, third paragraph: no measurements in the night of October 26 – shouldn't it be October 23 according to Table 1?
7. Section 4.2, discussion of Fig. 5 and fluorescence effects: It should be briefly explained where the fluorescence comes from and how it could be avoided, even if the details are discussed in accompanying papers.
8. Section 4.2, discussion of Fig. 8, and Section 8: Time of observation should be mentioned (19 October). The summary refers to another case not presented in this paper (20 October); this is a bit confusing.

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9. Section 4.2, last sentence: does not fit here, belongs to Sec. 2.3.

#### Figures

In general, the figures are of good quality. A few improvements might be necessary:

Fig. 5: This figure is too busy. Because it is the only one focussing on lidar profiles measured with different instruments, it should be prepared with a bit more care. Probably it could be further split into more panels or some curves could be left out. The exact integration times and the vertical resolution of the lidar measurements should be given.

Fig. 8: The color scales of the middle panels (O3, H2O) are missing.

Fig. 15: The descriptions in the lower parts of the two panels are not readable. Probably, this description can be left out when a clear explanation of the use of colors is given in the caption (check the caption for typos!).

All figure captions and legends should be checked for completeness and typos (what exactly is shown?, are all lines explained?, are all abbreviations explained?).

#### Other typos

Title of Sec. 2.3: raman -> Raman

Sec. 2.6, last sentence: period at end of sentence

Page 3293, line 1: R92 -> RS92

Page 3294, line 2: Due to of its. . .

Sec. 4.4, last sentence: period at end of sentence

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