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Atmospheric Measurement Techniques Discussions

Interactive comment on "Use of rotational Raman measurements in multiwavelength aerosol lidar for evaluation of particle backscattering and extinction" *by* I. Veselovskii et al.

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We would like to thank Referee 1 for reading the manuscript and for useful suggestions. Below we provide our response and revisions introduced in the manuscript.

1. Expand optical scheme of Fig. 7 to include the two PR Raman interference filters, because that is the most relevant part of the modified receiver.

Done

2. Discuss the experimental set-up in more detail. E.g., are the PR Raman filter tilted?

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Interactive Discussion

Discussion Paper

Filters were installed normally, corresponding comment was added to the text. The optical scheme in Fig.7 was expanded.

What was the backscatter ratio of the clouds you report complete blocking of elastic light for? Demonstration of receiver performance in the presence of clouds is recommended.

In the revised version of manuscript we added Fig.8, illustrating the performance of RR channel in the presence of cloud. The scattering ratio for the case considered is about 300.

Please, name manufacturers of all optics shown in Fig. 7.

We mention that RR filters were manufactured by Alluxa. The rest of elements are standard, so probably it is not necessary to give all the details.

3. Discuss measurement of Figs. 8 and 9 in more detail. With a lidar ratio of about 60 sr this is clearly an (elevated) aerosol layer and not a cloud. Was A=1 chosen so that the extinction profiles match? Why the profile truncation at 1000 m (beta) and 1200 m (alpha), overlap issue? Use the same vertical range for both figures.

We have combined Fig.8 and Fig.9 in a single figure, so now vertical range is the same for extinction and backscattering. A=1 was chosen because this value is obtained from lidar 355/532 extinction measurements at the maximum of aerosol layer. Corresponding paragraph was introduced in the revised manuscript.

Technical corrections:

1. Throughout text: Indices must not be italic, differentials likewise.

But it looks like in AMT they use italic for indices. . .

2. Throughout text: Use the same style '... Fig. x' for figure references.

Corrected

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8, C2821–C2823, 2015

3. P. 9: Write 'Fig. 3 shows the RR spectra of ...'

Corrected 4. P. 12: Start new paragraph before 'Fig. 8 shows backscattering ...', otherwise misleading.

Corrected

5. P. 13: Write 'As in the case of HSRL, ...'

Corrected

6. Caption Fig. 4: Write 'The reference...'

Corrected

7. Caption Fig. 8: Write 'Dash-dot line...'

Corrected

8. Caption Fig. 8: Write '... radiosonde.'

Corrected

9. Caption Fig. 10: Write '... 1 July ...'

Corrected

10. Fig. 10: Use different line styles for the extinction profiles.

Line style is changed for solid

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 6759, 2015.