

Interactive comment on “Correction of water vapor absorption for aerosol remote sensing with ceilometers” by M. Wiegner and J. Gasteiger

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Introduction

We want to thank reviewer # 2 for his/her careful reading and the suggestions to facilitate the understanding of the methodology. That helped us to improve the manuscript. The main proposal of the reviewer is to add "some tables and schemes summarizing procedures and results".

→ *We have considered these points, see details below.*

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Point by point replies

- However, I just feel that a flow chart of the procedure is missing. Such a figure would be very useful for readers to figure out the entire procedure. I strongly recommend the authors to insert that, in order to make the paper more easily comprehensible.

→ *We understand the reviewer's recommendation. Therefore we have added an equation to support the statements made in the text (Section 4.1, paragraph starting with "On the basis of these findings a water vapor correction scheme..."):*

$$T_{w,\text{prx}}(\lambda, z) = \exp \left\{ - \int_0^z n_w(z') \overline{\sigma_w}(\lambda, z') dz' \right\} \quad (21)$$

Then it is easier to create a flow chart as we can refer to the equations. The flow chart (see supplement to this file) has been added at the end of the same paragraph. It now reads: "Finally, the effective (approximative) water vapor transmission $T_{w,\text{eff},\text{prx}}(z)$ is derived analogously to Eq. (15) and used to determine β_p (Eq. 3). Fig. 4 may further clarify the entire procedure of WAPL; the required input for the evaluation is highlighted by the yellow boxes.

- A synoptic table summarizing some results (accuracies and remarks for backward and forward inversion scheme, for different atmospheric states) are welcome, too.

→ *We are a little bit sceptical about this suggestion. Of course it would be nice if a specific number can be given (e.g., "if water vapor is neglected the relative error of β_p is 15%"). However, we feel that with such a statement the*

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situation is oversimplified. We want to avoid that our paper is cited "According to Wiegner and Gasteiger (2015) the error is 15%". We have shown in Figs. 12 and 13, that the range of errors is height-dependent and very large as the water vapor concentration is quite variable. Consequently, our main message (see section 5.2) is that water vapor may not be ignored and that each researcher has to calculate a specific correction for the individual measurement. To stress this again we have added the following sentence to the end of section 5.2.

"These results confirm that it is not possible to find one generally applicable value for the β_p -error if water vapor absorption is neglected."

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/8/C2994/2015/amtd-8-C2994-2015-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 6395, 2015.