Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2018-358-RC2, 2018

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Extreme levels of Canadian wildfire smoke in the stratosphere over central Europe – Part 2: Lidar study of depolarization and lidar ratios at 355, 532, and 1064 nm and of microphysical properties" *by* Moritz Haarig et al.

Anonymous Referee #2

Received and published: 17 July 2018

Review acp-2018-358:

Main comment: This manuscript presents the depolarization and microphysical properties of an extraordinary event of Canadian wildfire smoke detected in the stratosphere over central Europe. Being the second part of two papers about this event, the main findings are: 1) the quite complete information provided (lidar ratios and depolarizations at several wavelengths) and 2) the strange high values of the depolarization in

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Discussion paper

the stratosphere. Despite the reason of these high depolarization values remains unknown, authors provides consistent hypothesis. Thus, the presented work is a good contribution to the scientific community so I recommend its publication. I appreciate that it was easy to read and I didn't find any typo! However, the authors should consider the following comments:

Major comments: Errors in Table 1 should be included as performed in the rest of tables and graphics. This is quite important since the lack of these errors prevents to track the propagation error from optical to the microphysical properties, which leads me to my second major comment: microphysical property errors shown in Table 2 are around 30%, quite small to my opinion considering the assumptions and the way properties at 1064 nm are derived. I suggest including a detail explanation about the error propagation and its interpretation.

Minor comments:

- Page 6 line 1: How the PBL height was determined? Is the given value an average during the considered period? I guess that the PBL includes the residual layer, it would be nice if you can confirm.

- Page 8 line 30: I found Hu et al., 2018 or a very similar one in ACPD. Please, update the reference.

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