

## ***Interactive comment on “Aerosol particle depolarization ratio at 1565 nm measured with a Halo Doppler lidar” by Ville Vakkari et al.***

### **Anonymous Referee #2**

Received and published: 16 January 2021

In their manuscript the authors describe a new method to derive the particle linear depolarization ratio for HALO photonics lidar systems. The particle linear depolarization ratio is a very important property to distinguish different aerosol types. Thus, an additional method to derive this important property is of high significance. The manuscript is very well written and easy to follow. The technique and the results are very well presented. I suggest publication after some minor revisions.

#### Comments:

The authors present a new method to derive the particle linear depolarization ratio at a quite long lidar wavelength. Can the new method / the particle linear depolarization derived from the 1565 nm measurements be used stand alone for aerosol typing, or is its main purpose an extension of existing classification schemes to provide additional

information for a more robust classification.

Can the authors give a few more words on the calibration of the two signals / on the uncertainties resulting from their kind of calibration? The mean values of the two systems do not show a significant difference; does it represent a universal characteristic of the HALO Photonics systems? How often should the calibration be performed?

The authors show an important comparison of their results compared to former measurements. Especially with regard to the longer wavelength, a comparison with results from optical modelling would be interesting and is missing in this manuscript.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-906>, 2020.

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Discussion paper

