

Letter of Reply to Referee 1

Thank you for carefully reading the manuscript and providing useful suggestions to improve the paper. The replies to your comments are given below. Changes in the manuscript are marked in the revised manuscript.

Minor Comments

1. Page 4. Line 106, 110, and 115: Author mentioned Doppler lidar in the paper. But, expressions in line 106, 110, and 115 are different. Please check it.

Thank you for that comment. It has been changed to the full name “Halo Photonics Stream Line Doppler lidar” or “Halo Doppler lidar” throughout the manuscript.

2. Line 153: “Elevated aerosol layers are likely lifted, or long-range transported, pollen.”. Could you add in additional explanations to explain the content of this sentence?

The layers that we observed between 3-5km are probably pollen which have been lifted by turbulence or long-range transported pollen as other sources of depolarizing aerosols are missing along the trajectories which only passed over Northern Europe and the Norwegian Sea.

Suggestions

1. Rupture of pollen grains is important in this paper. Can you add a picture of the fragment pollen ruptured by weather conditions etc?

Pollen rupture is indeed important when investigating the depolarization caused by pollen in the atmosphere. However, we don't have the necessary information about the amount of pollen fragments to characterize the impact of pollen fragments on our results (please also see comment 4 and 6 of Referee 2). We decided not to add a picture of pollen fragments in order not to emphasise the ruptured pollen in this paper. The impact of pollen fragments on lidar measurements could be an objective for future studies.

2. How about the change the scale of PDR 355 in Figure 3 (b)?

It is true that changing the scale of Fig.3b would increase the visibility of the profiles, however we would like to keep the scale subplots axis consistent. In this way the profiles at the different wavelengths are better comparable and the difference is clearly visible.