Reply to the referee's comments

We thank the editor and referees for the useful comments, which helped us to improve the quality of our manuscript.

In the following, the referees' comments are given in black.

Our point-to-point replies are marked by "R" and are in blue.

Changes to the manuscript text are in green.

1. Before we can make the final acceptance, I would like you to make some edits to the use of 'backscatter' and 'backscattering'. I checked the use with the two referees and had conflicting advice. Based on a combination of the referee's recommendations and the use of these terms in Chapter 10 of 'Aerosols and Climate' (Ed Carlaw), I would like you to use the term 'scattering' or 'backscattering' when referring to the process, but use 'backscatter' when in conjunction with 'coefficient'.

R: We have check the manuscript carefully and corrected this.

2. Regarding figure 8: please ensure that the colour schemes used in your maps and charts allow readers with colour vision deficiencies to correctly interpret your findings. Please check your figures using the Coblis – Color Blindness Simulator (https://www.color-blindness.com/coblis-color-blindness-simulator/) and revise the colour schemes accordingly.

R: We have changed the colormap accordingly to ensure the colour schemes allow readers with colour vision deficiencies to correctly interpret the findings .

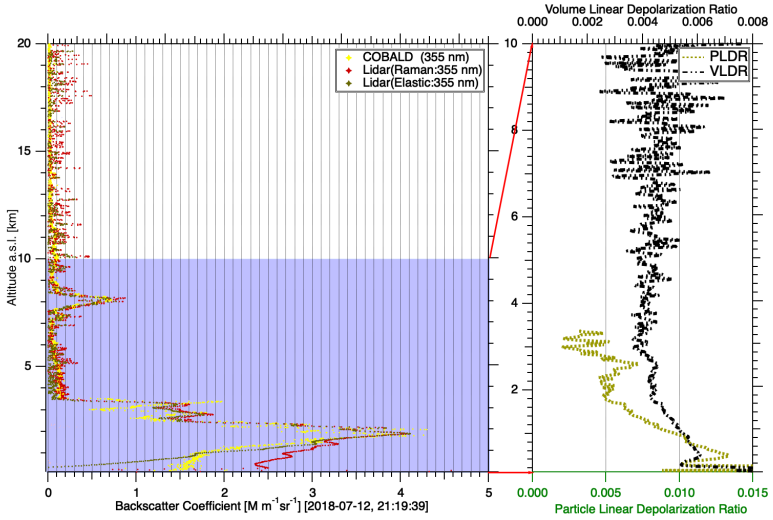

Figure 1: Backscatter coefficients measured by balloon-borne COBALD and LIDAR (left) as well as aerosol volume and particle depolarization ratio measured by LIDAR (right) on the night time of July 12^{th}, 2018 at Jülich research center. (The integration time of the LIDAR data is 1 hour from 21:19 to 22:19.)