

## Answer to Anonymous Referee 4

The authors are grateful for the time and thought that Anonymous Referee 4 put into the review and comments regarding our paper. We incorporate most of those comments into our revised manuscript, which has led to substantial improvements. Detailed responses to all comments follow below. The original comments from Anonymous Referee 4 are in italics and our responses in plain text.

*This manuscript presents a research study to investigate the influence of uncertainties in input data on the simulated cirrus cloud properties. The study is interesting, and the paper is well written. I suggest publication of the manuscript after consideration of some mostly minor comments.*

### General comment:

*Considering the evaluation of the model with lidar measurements I agree with reviewer #3 that one case study with observational data of 20 min may be too specific and the results may not be comparable to other conditions.*

This issue has already been addressed in the answers to Reviewer #3.

### Specific comments:

*p. 7536, l. 15: Typo - ‘bysignificantly : : :’*

Done

*p. 7546, l. 9: What about the extinction calculated from lidar measurements? Is this property sensitive to the retrieval and input parameters?*

In Fig. 8 & 9 as well as Fig. 14 the uncertainties in the lidar evaluation (uncertainty in lidar ratio, in the signal itself as well as the molecular properties, see p. 7542 line 6-11) is shown.

*P. 7546, l. 18: Typo - ‘compares compares : : :’*

Done

*p. 7547, l. 19: Do you mean differences in the on- and offline trajectories?*

Yes, we added this information to the sentence.

*p. 7551, l. 6: Can you explain these differences?*

The differences at long-wave length are very likely related to differences in the large-scale meteorological situation, i.e., smaller or larger gravity wave activity. There is a number of potential sources for this variability as for instance: differences in the stability of the lower atmosphere changing the vertical propagation of gravity waves induced in the lower atmosphere (e.g., ), differences in the wind direction and strength modifying the generation of terrain-induced gravity waves, the presence or absence of deep convection or fronts, which may induce gravity waves.

*p. 7551, l. 27: Do you mean ‘ascent data’?*

Yes, this has been corrected.

*Figures 6 and 7: labeling/time scale is inconsistent (upper and lower panel) for 1m and 20s cases.*

Thanks, this has been corrected.

*Figures 11-14: Maybe the order of the figures should be adapted following the argumentation in the text.*

We are not sure what the referee means, since the order of the figures is identical to the sequence they are mentioned in the text.