

**Suggestions for revision or reasons for rejection (will be published if the paper is accepted for final publication)**

We thank the reviewer for her thorough reading and all her suggestions and help! Please find below detailed answers on how we addressed the suggested corrections. For better readability we show the reviewer's comments in blue and our answers in green.

Thanks to the authors for answering to each comment in detail and for improving the manuscript. I have a few more minor points which would be good to address before final publishing.

As I suggested in my first review, a separation of a results and a discussion section would be very helpful. In the new version, the structure of the results improved and it is more clear now which parts are results and which are discussion. However, sections 4.1 and 4.2 are very long and need a subdivision with headings for improved readability.

The sections were subdivided with the following headings:

4.1 Impurity type and concentration in snow without shrubs

4.1.1 Results from the  $k_e$  analysis

4.1.2 Results from SnowMCML simulations

4.1.3 BC as significant absorber

4.2 Insights into the radiative effect of buried branches

4.2.1 Comparison of log-irradiance profiles with SnowMCML simulations

4.2.2 Spectral shape of  $k_{e\_meas}(\lambda)$  vs.  $k_{e\_calc}(\lambda)$

4.2.3 Radiative effect of buried branches

4.2.4 Local heating effect and impact on snow physical properties

The quality of the figures should be improved further:

(I) same font sizes in all figures (please consider the final figure width as specified in the journals guidelines); the fonts are still too small in Figures 3, 4, 5(only layer labels), 6(only layer labels), and 7 while they are too big in Figure 1 and 5(some of the labels); in Figure 6 the label 'Depth, m' has different font sizes in both rows;

Font sizes were changed as suggested. However, as we don't know the final typesetting of the manuscript it is possible that further adaptation will be necessary during the author proof readings.

in Figure 8, the labels (like (a) and (e)) are in different fonts

Labels were set to different colors as the backgrounds are different. We set all fonts to same color and highlighted the text with white squares instead.

(II) remove the thin grey lines in Figures 2, A2.1 and A2.2,

We are not sure which grey lines the reviewer is referring to. Is it the grid lines in the plots and map?

(III) Figure 4: include meaning of shaded area and star in legend or caption,  
The meaning of the shaded area and star were included in the figure.

(IV) Figure 7: remove x-axis labels and x-tick labels from the top row and shift it down to the other two rows.

We maintained the x-axis label here because the two rows belong to different sections ((a) and (b)) of the figure. The section annotations were missing in the last manuscript which was an oversight on our part – we apologize for that mistake.

Consider changing from supplement to appendix. Appendices are part of the manuscript whereas supplements are published along with the manuscript. Since you are referring to the figures in the main text, I suggest to use the appendix format, since it makes it easier to access the extra figures.

We agree with the reviewer but due to high costs of publication we decided to keep the additional material as supplements.

Move equation (4) (lines 488-494) to the methods part.

We moved the Equation (4) to lines 295 – 298.