We thank the reviewer for the positive and constructive feedback. Below, we have replied to each of the comments. Reviewer comments are in italic black, while our responses are in blue, and not italicised.

We have also made the software codes for analysing the data publicly available, and updated the code and data availability section accordingly.

In addition, we noticed we had forgot to include the coefficients for the linear fits to the annual net shortwave differences in Fig. 11. These are now added in a table format, and referred to in the text. We also noticed that there was a programming error in the springtime fits to Fig. 11: this was now corrected, and the new model shows even higher R^2 than before (0.855 vs 0.793 previously). Finally, the summertime albedo in the model was not statistically significant either when modelling the site pairs individually, or together: as a result, we dropped that from the model, and only kept the mean summertime global radiation. Fig. 11 colour scale and caption was updated to reflect this. These edits do not change any conclusions of the manuscript. The updated Fig. 11 is shown below:

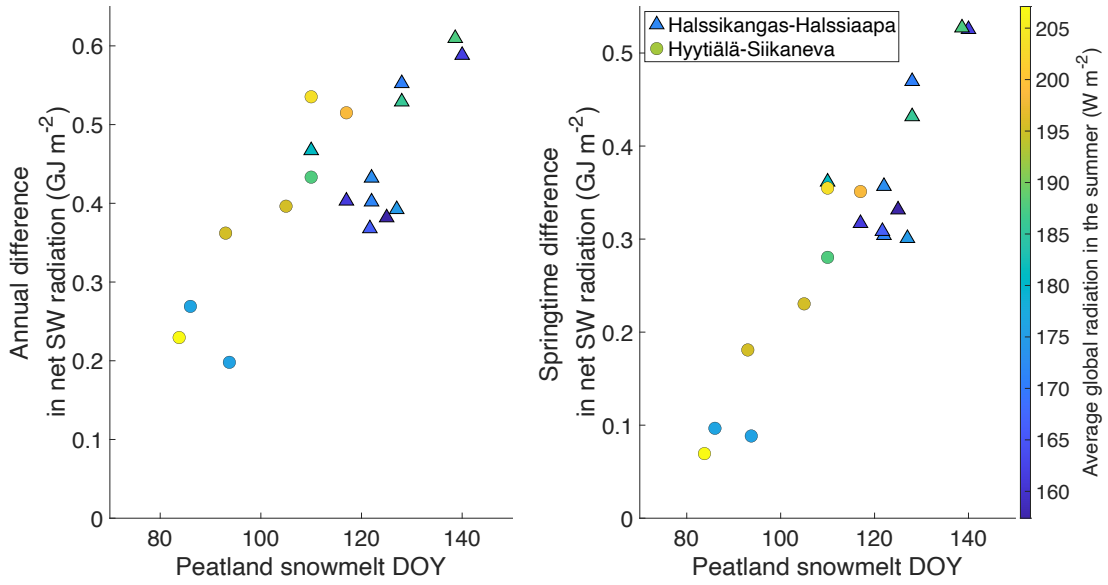

Figure 1: Updated Fig. 11, now with summer global radiation as the colour scale.

Thank you for incorporating my previous feedback. The manuscript now presents a more quantitative analysis regarding the differences in net shortwave radiation between the biomes (peatland and forest) and the locations (north and south), as well as their interannual variations. I would like to offer a few additional minor comments for further refinement.

We thank the reviewer for the encouraging comments.

L10 It is often advisable to explicitly state the direction of change rather than merely indicating that one variable depends on the other. For example, Higher diffuse fractions

were associated with increased albedo during winter and decreased albedo during summer.

We have now rephrased to "The albedo was found to depend on the diffuse fraction of the incoming radiation*: during snow-covered period, higher diffuse fraction was associated with lower albedo, while during snow-free period it was associated with higher albedo.*"

L26 "net" or "absorbed" instead of "incoming"?

We replaced "incoming" with "net"

L23 Did you compare interannual variations of snowmelt disappearance date between peatland and forest? Are you able to rule out the possibility that there were more interannual variations in the snow cover duration in forest than in peatland?

Thank you for the useful comment. The snow melt at the peatland has a much larger impact on the energy balance, as the difference between snow-covered and snow-free albedo at the peatland is much larger than at the forest site. But as the question of snow melt timing is an interesting one, we updated the snow depth plot (Fig. A1 in the manuscript, Fig. 2 below) to include also the forest sites, and added an additional figure (new Fig. A13 in the manuscript, Fig. 3 below) to compare the snow melt dates between the forest and the peatland sites. We also added discussion on this to the section 3.5.: "*The snow melt happened nearly always later at the forest site than at the corresponding peatland site (Fig. A13). Generally, the snow depth also reached higher values at the forest sites (Fig. A1), possibly explaining in part the delay in the snow melt (Ikawa et al., 2024). The forest snow melt has a lesser impact on the difference in the net shortwave radiation between the sites, as the difference between the snow-covered and snow-free albedo at the forest sites was smaller.*"

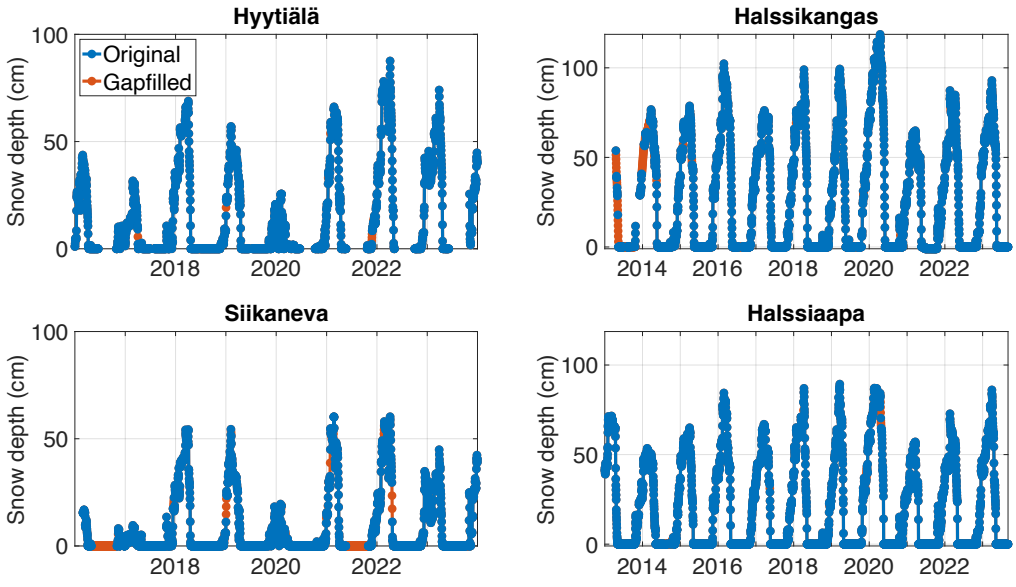

Figure 2: Fig. A1 in the manuscript, now with the addition of the forest sites

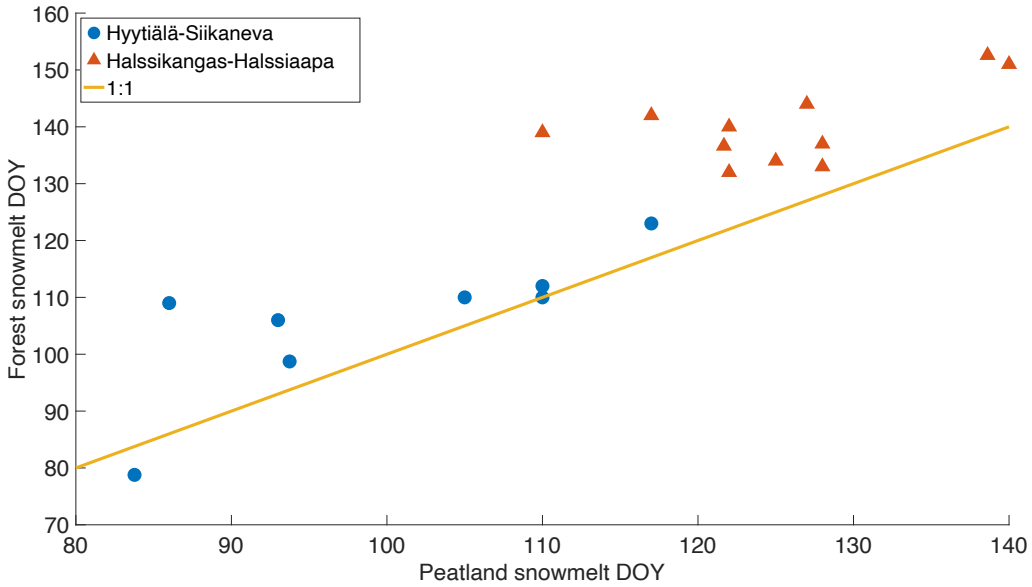

Figure 3: New Fig. A13, comparing the snow melt date between the forest and the peatland site

L102 I suggest including information regarding the fraction of missing data when calculating the annual average energy fluxes.

We already provide this information on line 152 of the manuscript (Check final line!): "This resulted in 86% of the data being measured for Hyytiälä-Siikaneva, and 78% for Halssikangas-Halssiaapa, with the rest being gapfilled."

L171 please use "direct solar radiation" instead of "sunlight".

Corrected

L181 The peak values of albedo in spring

Changed

L236 due to high solar zenith angle - how? Is the mechanism different from the increased uncertainty in L217?

This is the same effect: we have removed the extra mention here.

L311 Have you considered the case that the earlier peat-forest difference in albedo was due to earlier snowmelt? Or is the greater increase of shortwave radiation still important compared to other factors related to snowmelt (longwave radiation, turbulent heat flux and snow depth)?

The earlier snow melt in the southern pair is visible in the decrease in the net SW radiation difference later in the spring. The earlier increase in the difference in the southern pair happens during a time when the ground is still snow-covered at both sites, and thus can be attributed to increasing shortwave radiation according to formula 2 in the manuscript. The increase in the shortwave radiation in this case precedes the

snow melt. A more detailed attribution of the snow melt to these factors falls beyond the scope of this study.

L336 Please consistent regarding either "SW" or "shortwave" in the text. I recommend the latter.

We have changed all instances of "SW" in the main text to "shortwave". In Fig. 3 and 7 axis labels we have kept SW for brevity.

L380 Sensible heat flux is often negative over snow-covered surfaces, meaning heat is dissipating into the snow.I suggest: The total surface energy balance is also influenced by other energy flux components, including atmospheric radiation and turbulent heat fluxes. Please refer to Ikawa et al 2024 WRR, in which, we suggested essential energy flux components in snow-covered forest in a very simplified system.

We have reformulated as suggested and added the reference.

Fig. 3, Fig. 7 "Reflected shortwave radiation" On the y-axis

Changed to "Reflected SW radiation" to save space

Fig. 5 It is difficult to see if there is any relationship between albedo and diffuse fraction in summer. i suggest separately drawing graphs for summer and winter. Also I suggest targeting a certain range of snow depth insead of throwing all data on the graph.

We have split the figure into two (new manuscript figs 5 and 6, figs 4 and 5 below), one for snow-covered (snow depth at a site over 10 cm), and one for snow-free (snow depth at both sites within a pair zero), and agree that this improves the clarity of the presentation.

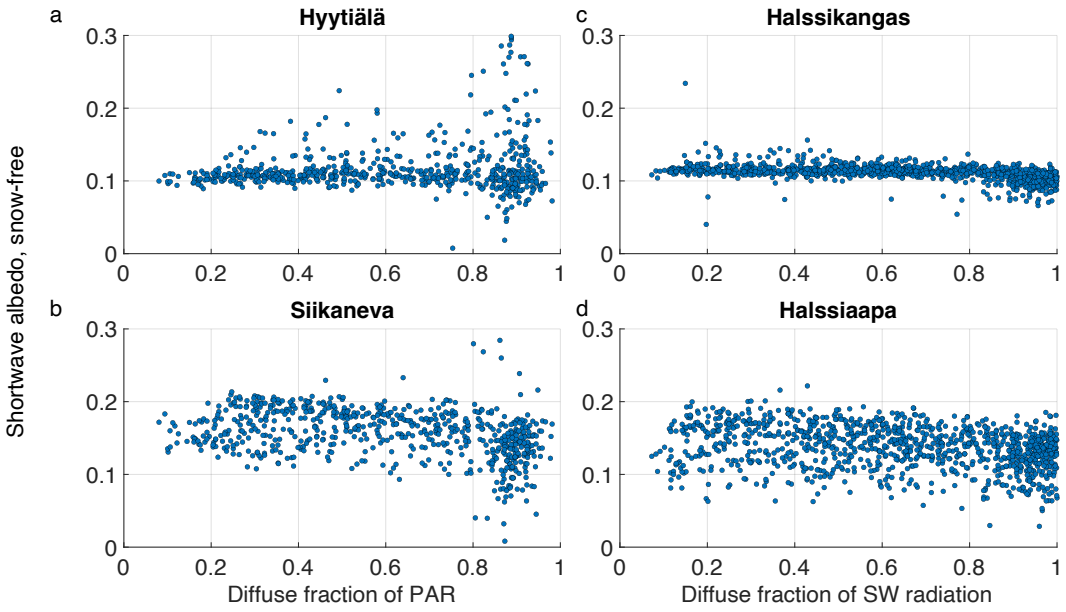

Figure 4: dependence of snow-free albedo on diffuse fraction of incoming radiation, new manuscript figure 5

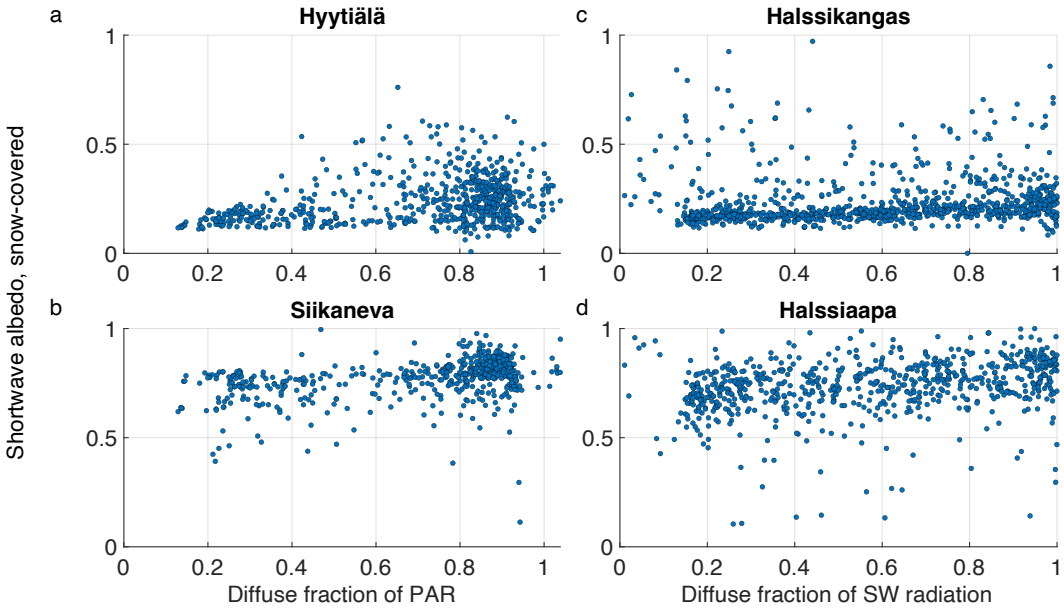

Figure 5: dependence of snow-covered albedo on diffuse fraction of incoming radiation, new manuscript figure 6

Fig. 9 It is advisable that the legend does not cover data.

Corrected