Cover Letter

Response of the authors to the reviewer's comments

Manuscript: Transmissivity of solar radiation within a Picea sitchensis stand under various sky conditions

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The authors would like to thank the referees for their valuable remarks, constructive comments, and careful corrections which helped to increase the overall quality of the manuscript.

All changes are marked in bold red throughout the revised manuscript.

Anonymous Referee #2

The observations were apparently well planned and executed but the manuscript lacks some key methodological details.

Reviewer # 2 detailed comments	Response	Author's reasoning , comments
In the Methods section, please add the following details: - How many clear, cloudy and overcast days were observed?	Dealt with	As previously stated measurements introduced in this study were carried out on three days only. We believe by averaging over several days introduces biases as solar radiation (intensity and clearness index) would be not the same, the solar angle shifted and the exact location within the canopy not reproducible. Also measurements are influenced by wind. We have added an explanatory sentence that this study is a snapshot and days shown differ in 600 umol/m2/s, which is a fortunate coincidence.
- How long did each observation last?	Dealt with	Each measurement represent 10 (instrument internally averaged) measurement that have been repeated three times resulting in an average of 30 measurements per data point (as stated in the method section). Each measurement suite (tower, transect and TRAC measurement) took 20-30min each.
- For each sky type, how were measurements from different days processed, e.g., did you average them? If so, how?	Dealt with	Please see above.
I also find Figure 2 confusing. As the figure caption indicates, plot (c) is a visualization of plot (a) which is the solar spectrum above the canopy in a clear day. But how come the y axis of plot (c) is height above ground? The pattern in plot (c) does not appear to be uniform along the y axis so it must not be an attempt to match the rest of the plots.	Dealt with	We agree, this figure is confusing. It has therefore been modified now. In addition we have added two extra figures showing separately the typical solar spectrum with its feature and colour coding as well as well as the main spectral features.

Also it needs to explain, with an equation, to show how the normalization on a scale from 0 to 1 is done. Is the denominator the total energy across the full spectrum for a given height?	Dealt with	We have now included the equation showing how we have scaled the data, which is a standard way to normalise data (Normalised data = (x-min(x))/(max(x)-min(x)).
Because there are no error bars on the figures, I assume the authors display results from measurements in a single day. Then it will be necessary to explain why these particular single days are chosen.	Dealt with	Here we have shown the averaged values of the measurements mentioned above. The probability that measurements can be taken again in exact same location (time and space) under exact the same solar radiation intensity is rather small. Therefore we limited the data used in the current study to show a snapshot showing 3 distinctive sky conditions and a difference in PAR of approx. 600 umol/m2/s between clear and cloudy and cloudy and overcast. We have added an explanation in the main manuscript mentioning this reasoning. In order to carry out all these measurements we had to use six instruments (2x GER, 2 laptops, the TRAC instruments and the camera for the sky) with often at least one failing half way through the measurements.
It might be informative to point out in the plots some of the key spectral features.	Dealt with	We have modified Fig 2 (now fig 3) and have included a further figure showing the typical solar spectrum and the main spectral features. We have also included the spectra from all conditions above the canopy to show the little variation in spectral distribution according to time of year and sky condition.