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Discussions

Interactive comment on "Automatic monitoring of the effective thermal conductivity of snow in a low Arctic shrub tundra" *by* F. Domine et al.

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Domine et al. describe an important set of measurements of the thermal conductivity of snow in shrub tundra and give a useful discussion of how understanding of the processes that determine conductivity could be improved. My comments are restricted to some requests for clarifications and minor corrections

Clarifications:

page 1634, lines 17-21

These are important comments on the impacts of shrubs on snow, but none of them were directly "observed" in the work presented here.

C328

1635, 4

Insert the units of F and k_eff here.

1636, 8

Note that Myers-Smith and Hik (2013, doi:10.1002/ece3.710) did not find evidence for increased nutrient cycling in shrub manipulation experiments, possibly because soil temperatures were decreased in summer due to increased shading by shrubs.

1640, 1

Was the sampler really a parallelepiped? A triangular prism is a more usual shape.

1641

More information is required on the manual analyses. How was convection determined? – a subjective judgement of curvature in the profile before 100 s or a pre-set threshold? Was the distinction always clear-cut? How was the best time interval selected manually? For the profile in Figure 2a, it looks like a 20-50 s interval would have given the same conductivity, but Table 2 suggests that this was not always the case for profiles without convection. Showing an example of a non-convective profile that requires a delayed time interval would help the reader to see what is happening in these cases.

1645, 21

There is no Fig. 8.

The writing is excellent, but I have a number of minor corrections to suggest:

1634, 16

"events in the second year"

1635, 5

C329

"it is meant to represent"

1635, 7

"it also implicitly includes processes"

1637, 16

"20 cm high at most"

1638, 12

"and avoid resulting perturbations in the measurement of k_eff"

1639, 1

"the snow's natural evolution"

1640, 2

"breaking ice layers cleanly"

1641, 4

"accurately and automatically extracting"

1641, 5

"we first analysed our data manually"

1641, 20

"we concluded the absence of convection"

1641, 21

"We then divided our heating curves into 2 classes"

1643, 9

"squared correlation coefficient is equal to or greater than"

1645, 12

"snow redistribution by wind was important"

1649, 6

"These tentative corrections can be refined when the differences between NP and SIM measurements are better understood"

1649, 9

"so there is room"

1649, 19

"centred on the winter solstice"

1649, 25

"combined with the cold temperatures"

1650, 16

Insert a comma after "on 18 November", or put it in parentheses.

1652, 6

"which transformed recent precipitation"