

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

Anonymous Referee #2

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General comments: The research results presented in the manuscript represent significant contribution to the state of knowledge of seasonal variation of snow thermal conductivity in an Arctic environment and snow thermal conductivity variations in shrub covered areas; understanding of both processes is currently lacking with a definite dearth of observations available. The manuscript describes the methods used well; in particular, the discussion of the limitations of the transient needle probe method and the analysis of the data is well thought out and presented.

Technical comments (many of these are very minor): Page 1634, Line 2: The temperature gradient isn't impacted by thermal conductivity, but thermal flux is.

Page 1637: It might be good to introduce the average annual snow depths and/or general snow characteristics in this section. It is hard to envision how much the shrubs

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are being buried without this information. Also, begs the question of why the probes are put lower in the snowpack or why they were installed at these heights.

Page 1638, Line 12: "avoid that it perturbs the measurement" is awkward, would suggest, "to avoid the measurements of keff being influenced by convection."

Page 1638, Line 14: suggest deleting the word "one" after "horizontal"

Page 1639, Line 8: "resulting in general in parts" doesn't make sense, suggest just, "resulting in parts of the plots..." or somehow quantify or clarify what is meant by the phrase "in general" Does this mean often or usually??

Page 1639, Line 16: "which performed hourly measurements" isn't right, but maybe make a new sentence, "Measurements were recorded hourly."

Page 1639, Line 22: "in a white...tubing" should be "in white...tubing" without the "a"

Page 1640, Line 27 should be "which gives a" instead of "which give a"

Page 1641, Line 20 "we concluded to the absence of convection" should be, "we concluded there was an absence of convection" or "we concluded there was no convection"

Page 1642, Line 11: "finally we applied a last check to ensure results quality" should be "finally we applied a last check to ensure the quality of the results."

Page 1645, Line 21: There is no figure 8, although it is referenced, maybe this is figure 6 or 7 instead?

Page 1647, Line 10: This paragraph doesn't make sense. How can many values of alpha be 1, but then most range between 0.75 and 1.45? Maybe this can be clarified. 0.75 and 1.45 don't seem to be that close to 1.

Interactive comment on The Cryosphere Discuss., 9, 1633, 2015.