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Geoscientific Model Development Discussions
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# *Interactive comment on* "Using field observations to inform thermal hydrology models of permafrost dynamics with ATS (v0.83)" *by* A. L. Atchley et al.

**Anonymous Referee #2**

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This paper describes an excessively detailed assesment of how to model a set of temperature measurements done at different depths in an Arctic landscape.

The topic area of this study and model development is important. However, this paper seems to overshoot the goal of providing a straightforward and useable modeling approach for these systems.

It is unclear how this kind of model simulations could be used to inform models at a regional scale.

Why spend so much effort on the detailed parameterisation of thermal properties if lateral heat flow might be important, which is then not included. It seems awkward to fix the lower temperature boundary, it is unclear what this is based upon.

The paper is written very densely, but still does not contain enough information to fully appreciate what it is that has been carried out, and how. On the other hand this contains to much information without detailed description resulting in a difficult to read.

One is left with a feeling that the authors invested a lot of effort to develop a unusually detailed model but then fail to carry out a sensitivity or uncertainty study to evaluate the need for the complex model construction presented here. Could the same fit be obtained with a much simpler model too? In other words what is the sensitivity of the model fit to model complexity?

Other comments are provided in the attached annotated PDF.

Please also note the supplement to this comment:
http://www.geosci-model-dev-discuss.net/8/C1330/2015/gmdd-8-C1330-2015-supplement.pdf

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Interactive comment on Geosci. Model Dev. Discuss., 8, 3235, 2015.