The Cryosphere Discuss.,
doi:10.5194/tc-2016-227-RC1, 2016
© Author(s) 2016. CC-BY 3.0 License.

The Cryosphere Discussions
Open Access
EGU

Interactive comment on "Numerical modelling of convective heat transport by air flow in permafrost-affected talus slopes" *by* Jonas Wicky and Christian Hauck

Anonymous Referee #1

Received and published: 25 November 2016

In this study the authors successfully model convective flow in form of the so-called 'chimney-effect' in a permafrost affected talus slope. This is achieved in an idealised model setup using a commercially available model, GeoStudio. The authors simulate seasonably dependent flowpaths and cooling/warming effects at toe/head of slope. These results are in agreement with field observations from previous studies.

I think this is an interesting and valuable study that demonstrates, to my knowledge, a first numerical simulation of such effects in an alpine setting. It is a good first step towards explicitly describing this significant process in commonly used permafrost models. The study is clearly setup and manuscript well written with a nice flow of argumentation which made it enjoyable to follow the authors work. I think this study is a useful

Printer-friendly version

Discussion paper

CC BY

contribution to field of permafrost modelling and only recommend the largely superficial comments below.

COMMENTS

1. Abstract l15: these numbers do not appear elsewhere in your text/results. Make sure consistent with main text.

2. p2 l3: you mean overcooled?

3. p5 l25: ...consists of gneiss and is at least 40 m deep, as observed in borehole cores...

4. p6 l2: "They were all able..." - Who were? –> "Such previous studies were able to show..."

5. p6 l3: "on a small scale" –> at fine scales.

6. p6 l16: remove "hereby".

7. p6 l19: "model runs numerically stable" –> model is numererically stable.

8. p7 l9: remove 'similar'.

9. p8 l24-28: Try to break this sentence up so more readable - quite a mouthful now.

10. p9 l2/Fig 4. Perhaqps mention/explain the bidirectional flow in June/July.

11. p9 l2: remove "hereby".

12. p9 l5: remove "hereby".

13. p10 l23: 'Identical'- Im being picky but they dont quite look identical - which could be true as you have some residual summer snow which would have an effect from 20cm depth. Of cause this summer snow could be measurment problems like the IMIS-grass effect.

14. p12 l1: "...comparison can only be qualitatively made..." –> ...comparison can only

Printer-friendly version

Discussion paper

CC BY

be qualitatively made...

15. p12 l2: "Most notably is hereby the presence..." –> "Most notable is the presence..."

16. p12 l6-8: Section 5.3: refernce Figure 9 is missing.

17. p12 l18: Perhaps - The strength of this modelling approach lies in the fact that convective heat transfer is...

18. p12 l22: ..and hence there is no ice buildup...

19. p12 l22: This allows assesment of the influence...

20. p13 l9: we didnt see these values before. Similar to comment #1, be consistent with results in main text.

21. Acknowledgements: mention IMIS.

22. Table 1: remove hereby –> The snow layer is represented as an idealised...

23. Figure 6: Use solid/dashed lines, or similar, to distinguish nodes A/B.

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2016-227, 2016.

CC BY