Hydrol. Earth Syst. Sci. Discuss., 5, S2180–S2182, 2008
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Hydrology and Earth System Sciences Discussions

Interactive comment on "Impacts of changes in vegetation cover on soil water heat coupling in an alpine meadow, Qinghai-Tibet Plateau, China" *by* W. Genxu et al.

W. Genxu et al.

Received and published: 15 December 2008

Firstly, we like to give our devout thanks to the anonymous reviewer who take a lot of time to provide some valuable suggestions to our manuscript.

General comments: 1. Overall, the level of English is quite good. I have addressed some of the issues above, but the entire manuscript could really use a good polishing. We obtained the help from Dr. Salehi F. and Dr. Li Benjamin to re-edit and checked the final version of the manuscript in English grammar and sentence structure.

2. I would like to see in the Discussion some comparison made with studies from other areas, like those described in the Introduction. Particularly, whether climate change will

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Interactive Discussion

Discussion Paper

have a positive or negative influence on soil moisture in permafrost areas covered by similar vegetation. We re-adjusted the structure of the Discussion by adding some findings obtained from other permafrost regions. To compare those findings with the results presented in this research, we discussed the similar in soil temperature variation and the difference in soil moisture variation. In addition, we discussed the permafrost land surface changing tends under climate warming change in the Qinghai-Tibet Plateau.

3. The only aspect of the paper that limits the scope of the results is that it is restricted to permafrost meadows. It would be great to see the authors apply similar methodologies to other vegetation types. Jayawickreme et al. (2008) reported the large difference in root-zone moisture dynamics for two difference vegetation types (forest and grassland) in no-permafrost region. Sommer et al. (2003) revealed the different secondary vegetation have the different influence on deep soil water dynamics and depletion in the eastern Amazon. Therefore, we believe the similar methodologies could be applied to other vegetation types and regions. In the permafrost region of the Qinghai-Tibet Plateau, the alpine meadows constitute the main land type. In 2008, we pay our attention on alpine swamp and steppe vegetation types, and we will report the results after two years observation.

Minor revision comments: 1. The 14 points pointed by the reviewer to revise. According to the reviewer’s opinion, we revised the all 14 errors pointed by the reviewer. By obtaining the helps from Dr. Salehi F. and Dr. Li Benjamin, the whole paper was polished in English.

2. You a log fit is best for one vegetation case and a hyperbolic function was best for another8230; is there any justification for either of these functions in terms of the physical processes acting between vegetation, soil, moisture, and atmosphere? We added a paragraph to discuss the rationality and their meanings of these functions. The main causes of different θv–Ts coupling pattern were possibly the variation of energy balance and heat conductivity, and the different in the initial ice content at the 0–20 cm soil layer under different vegetation cover. The differ-

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ent θv–Ts coupling pattern implied that there is different water and heat distribution and dynamics in active soil profile under the different vegetation cover.

3. In Discussion and Conclusions. These sections need a general proofreading for grammar, as there are numerous mistakes and awkward structures. We rewrite the Discussion and Conclusion, and revised the mistakes and awkward structures in the two paragraphs by the helps from Dr. Salehi F. and Dr. Li Benjamin.

References Jayawickreme, D. H., Van Dam R. L., and Hyndman D. W., 2008. Subsurface imaging of vegetation, climate, and root-zone moisture interactions, Geophys. Res. Lett., 35, L18404, doi: 10.1029/2008GL034690. Sommer R., Folster H., Vielhauer K., Vlek P. L. G., 2003. Deep soil water dynamics and depletion by secondary vegetation in the eastern Amazon. Soil Sci. Soc. Am. J. 67: 1672-1686.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2543, 2008.