The Cryosphere
Discussions

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Interactive comment on "Soil temperature-threshold based runoff generation processes in a permafrost catchment" *by* G. Wang et al.

Anonymous Referee #2

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Reviewed paper concerns the problem of seasonal thawing dynamics influence on water runoff. Despite the fact that this process controlled by ground surface temperature thaw depth at each particular moment of time does not correlate to surface temperature. So I would recommend to authors to rename the article to "Seasonal thawing - threshold...." and revise equations 2 and 3 replacing the function f(Ts) which is not clearly explained in the text by the function of temporal dynamics of sum of positive degree hours (sum of measured of temperature values multiplied by measurements interval. In this case they can use time as a threshold parameter. Page 5958, line 18. The phrase "zero thawing isotherm" does not make sense, use zero isotherm or thawing front. Page 5960, lines 23-25. It is not clear what do numbers of percentage

coverage of meadows and swamps mean. Is it part of the area covered by combined meadow and swamps? Why it is so variable? Page 5962, line 16. Given value of 0.25 mm is not accuracy but resolution of this type of sensors. The accuracy is 1 cm. Page 5962, lines 20-21. Soil water dynamics mostly controlled not by the temperature but by the thaw depth (see comment at the beginning). Page 5962, lines 23-25. Physical sense of threshold parameter (in this case temperature) must be clearly defined here. Page 5963, lines 16-18. Downward freezing actually controls both surface and subsurface discharge. lines 18-24. Give more explanations about dynamics of ground water discharge input in total runoff. Page 5965, lines 20-22. If authors ignore impact of winter snow what does Qs in equation 2 mean? Page 5966, line 5. How did authors defined f(Ts)? Is it empirical function based on combination of temperature and soil moisture measurements? Generally, from the text of paper is absolutely unclear what does this function means, what units it is measured in. Figure 3. Add another Y axes for f(T'). Since the concept of surface temperature direct influence on subsurface discharge does not look very good argued in the paper it is very difficult to comment results and conclusions.

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