The Cryosphere Discuss., 7, C1216–C1218, 2013
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The Cryosphere Discussions
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Interactive comment on "A note on the water budget of temperate glaciers" *by* J. Oerlemans

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Received and published: 29 July 2013

This paper presents a straightforward analysis of the internal melting of ice and snow in temperate glaciers due to the loss of potential energy in the flow of ice and water. In principle, this is a complicated subject involving the creation of melt channels, water level and water pressure variations on several time scales, such as diurnal and annual variations, and the dynamic response of the ice flow to variations in the glacier hydraulic system. In spite of these complications, the papers shows that some conclusions about the overall nature of the glacier hydraulic system can be drawn from general conservation laws assuming that water entering and flowing from the glacier is at the melting point.

The paper compares the amount of melt water created during "normal" glacier flow for glaciers with different size and steepness, as well as during and between glacier

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surges. These estimates vary widely between glaciers they are interesting and useful as background for other analyses where more detailed analysis is attempted.

Some minor comments/corrections:

page 2681, line 12: "steady-state" –> "quiescent" ??

page 2681, line 13: "In this note" –> "In this note,"

page 2682, 1ine 6: "this is ten times easier then" –> "this is much easier then"

page 2682, line 11: "Therefore" –> "Therefore,"

page 2683, line 11: "R will generally be small": This is often not true on temperate glaciers; in the lower part of the ablation area much of the precipitation will fall as rain. At any rate R will in most cases probably be much larger than dW/dt on the left hand side of eq. (1) so it is maybe not a good idea to say that it is small without specifying in comparison with what.

page 2683, line 20: rho should be inside the integration (since it varies in space and with z). Why use a prime on z rather than just z.

page 2686, line 17: A period is missing after the closing parenthesis.

page 2687, line 24: "In Table 1" –> "In Table 1,"

page 2688, line 13: "Mjelvold" –> "Melvold" (check several other places)

page 2689, line 7: "During a surge" –> "During a surge,"

page 2689, line 22: "Za-Zb" –> "Zb-Za"

page 2690, line 2: "Za-Zb" –> "Zb-Za"; The right hand side is clearly positive. Then deltaP should perhaps have a minus sign in front for consistency. (the change in potential energy during the surge is negative).

page 2690, line 6: "Za-Zb" –> "Zb-Za" (again the right hand side is positive and so is

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the amount of melt water generated during the surge)

page 2691, line 3, 15: "Leirufjarjökull" –> "LeirufjarÃřarjökull" (check several other places)

page 2696, table caption and second to last line of the table: "Breidamerkurjökull" –> "BreiÃřamerkurjökull"

page 2697, table caption: "same order of magnitude than" –> "same order of magnitude as"

Interactive comment on The Cryosphere Discuss., 7, 2679, 2013.