

Interactive comment on “Short term variations of tracer transit speed on Alpine glaciers” by M. A. Werder et al.

M. Pelto

mauri.pelto@nichols.edu

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Werder et al., (2010) provide a unique and valuable look at factors controlling the discharge rate through and beneath an alpine glacier. The uniqueness is provided by the contrast of a relatively constant discharge source into a moulin that feeds the main drainage channel and the typical diurnally varying sources feeding the main drainage system. The combination allows for a more comprehensive evaluation of discharge dynamics. The comments below are not meant to be a comprehensive evaluation of the paper. Instead the focus is on questions that this reader would like to see further explored in this valuable study.

666-11: The incision of the channel from Gornerssee is mentioned. It would be interesting and useful to mention the incision rate.

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672-12: How is R specified? This could have been answered and I missed it.

677-7: How is moulin cross sectional area determined?

677-14: How was sinuosity determined?

680-6: The lack of sinuosity independence from channel cross section and Manning roughness is noted. Can you give an example of how the sinuosity variation you calculate is affected by the other two parameters.

681-4: The timing and mechanism of the minima and maxima are key. The process is well described, but a schematic figure of what is happening would be very informative.

681-25: The variation of borehole water level for the three days is not as varied as the modeled results. This is attributed to too high a channel resistance and an immature connection. Do borehole observations later in the summer offer insight into either of these? The residence time overall is quite low indicating a fairly mature drainage system.

It would be particularly informative to include a picture of the moulin-channel setting for both glaciers.

Interactive comment on The Cryosphere Discuss., 4, 663, 2010.