

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

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This is an interesting, well written paper, which sheds light on some aspects of glacial drainage which remain poorly understood. The use of two contrasting sites is a particular strength, and increases confidence that the model is a useful too in a range of contexts. There are, of course, several sources of uncertainty, both in terms of the input data and the model results. These are, however, fully acknowledged by the authors and their commentary on these uncertainties is useful and illuminating. Their reflections on experimental design are especially useful. The paper is clearly written, and although many sections require focused attention this is perhaps inevitable with material of this complexity. The model and observational data are explained clearly, and the paper follows a logical progression of ideas towards reasonable conclusions. I have

C547

only very minor comments, as follows: 664.13 ‘asses’ should be ‘assess’ 666.9 This sentence is unclear. ‘respectively’ implies that there should be two values of transit speed, one for low flow and one for high, whereas only one value is cited. Perhaps the sentence should read: ‘by about 0.05 and 0.1 m sec<sup>-1</sup>. 669.9ff. This sentence appears to be conceptually unclear. I think it would be more accurate to say that the hydraulic head at the upper end of the R channel is equal to the water level in the moulin, which changes according to the discharge and resistance to flow in the R channel. (This is a physically clearer picture of the situation, and is a verbal description of Equation 3) 669 eq. 2. It is illogical to refer to  $h \geq h_{max}$ . Surely this should be  $h = h_{max}$ . 670.9 ‘heads’ should be ‘head’ 685.10 insert ‘one ‘ between ‘insights allow’ and ‘formulate’

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C548