

Re-review hess-2014-478

Dye tracing to determine flow properties of hydrocarbon-polluted Rabots glaciär, Kebnekaise, Sweden

General comments:

The overall quality of the submitted manuscript about flow properties of a Swedish glacier derived from tracer experiments has improved significantly. However, there are minor revisions needed prior I can recommend a publication in HESS.

Specific comments:

Are there any downstream villages or people living? This information would be nice to show the relevance for drinking water issues in the region.

I really like that figure 3 was included into the paper. It helps a lot understanding the observed dynamics of the glacier water. However, I suggest enlarging the time axis since the experiments started already on DOY 185. Furthermore it would be valuable to indicate the dates of the individual tracer experiments.

Please explain in the text (and the caption of figure 5) more clearly why there is no dye recovery curve for experiment J1, J2 and J3.

Please revise the explanation of experiment A7 (Page 10, Lines 32+33 and Page 11, Lines 1-10). Especially the explanation on Page 11, Lines 1-3 should be reconsidered. I cannot see this on the figure. The breakthrough curve of the manual water sampling and the measured curve look different in terms of peak tracer concentration, rising limb and falling limb. It would be very valuable to explain the experiment A7 in more detail, since a lot of the conclusions are finally based on those observations.

There is missing a clear explanation of what is shown on figure 7 in the last section of the results section (4.5 Dispersivity). Furthermore, it would be valuable to clearly explain already at this point (and not later in the discussion) how the four regime types were defined.

The caption of figure 7 should also be revised for more clarity: "... dispersivity (A), throughflow (B),..."

Snow is not always "highly permeable" (Page 17, Line 30). Think of ice layers of frozen snowpacks...

Technical corrections:

Page 1, Line 30: I think a citation is needed at the end of the second sentence of the introduction.

Page 3, Line 16: dye instead of Dye

Page 3, Line 27: "...hydrological system and system behavior." Is linguistically a bit weak.

Page 4, Line 2: I think c. is not the appropriate acronym for circa. I would prefer ca. Please check throughout the manuscript.

Page 4, Line 7: "...is in strong comparison...!" makes no sense here. Do you mean "unequal"?

Page 5, Line 14: "...down-glacier." Sounds a bit strange.

Page 7, Line 5: There is spacing missing before "The"

Page 9, Line 8: The figure-references should be in the same way (e.g. 4A or 4a) throughout the whole paper.

Page 13, Lines 9-13: "We find..." sound a bit strange in this section.

Page 13, Line 13: Figure 8 is a Table actually. Please modify throughout the whole manuscript (e.g. Page 14, Line 17).

Page 17, Line 14: Two commas!

Page 17, Line 21: with not in italic notation.

Page 17, Line 27: A dot at the end of the sentence is sufficient.