**Hydrology and
Earth System
Sciences**

Open Access

Discussions

Interactive comment on "Controls of macropore network characteristics on preferential solute transport" *by* M. Larsbo et al.

M. Larsbo et al.

mats.larsbo@slu.se

Received and published: 29 September 2014

Reply to anonymous Referee #2

-We would like to thank the reviewer for his/her very encouraging general comments and for constructive suggestions for clarifications and improvements. We have addressed all comments below and will make necessary corrections in the manuscript when all reviewers have posted their comments.

Specific comments

Abstract: The methods, analysis and results are well summarized; however, the objectives are not clearly stated. I suggest to explain the reason why "the relation-ships be-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

tween macropore network characteristics, hydraulic properties and state variables and measures of preferential transport" are examined, and to highlight the near-saturated conditions of the experiments, as clearly done at the end of the Introduction.

-Yes, we will re-write the abstract according to the suggestions.

Page 9554, line 1-2: Some references would be useful here.

-Yes, we will change the text from 'The most common...' to 'A common...' and add three references.

Page 9558, line 16 and 20: Justify equations (1) and (2), or give bibliographic references.

-We will add 'Equation 1 was chosen because it gave a good fit to the measured data (average r2=0.78)' to the text.

-We will add a reference supporting the linear relationship between bromide concentration and electrical conductivity (eq. 2).

Page 9559, line 11: Although references are given, the sentence would be clearer if you could provide examples for the "other model independent measures".

-We will add 'the holdback factor and the arrival time for the maximum concentration' as examples of model independent measures which are correlated to the 5% arrival time to the text.

Page 9562, line 19: The motivation of equation (10) is not clear: why the values 60 and 80 are chosen? How the reference values are estimated?

-From a visible inspection of the 3D-images it was clear that the sum of the macroporosity and the fraction of organic matter at any given radius from the centre of the column in a horizontal slice never exceeded 60% and that the stone content never exceeded 20%.

-The reference values for the 60th and 80th percentiles were chosen arbitrarily as the measured 60th and 80th percentiles for one of the columns. The reference values only determine the absolute scale of the grey values and have no consequences for the subsequent Otsu segmentation which is independent of the absolute scale.

-These points will be clarified in the text.

Page 9566, line 14 and Figure 5: It would be interesting to explain why the correlations observed at 1 cm tension are not observed at 5 cm tension.

-At 5 cm tension only a small fraction of the visible pore space is water-filled. This means that the pores below image resolution, which mostly reflect the soil matrix, influence the hydraulic conductivity at this tension.

-We will add a comment on this in the paper

3 Technical corrections Page 9560, line 13: L is already defined at page 9959, line 19.

-The redundant definition of L will be deleted.

Page 9560, line 15: the exponent 2 of the factor (t-_1) is missing.

-We will correct the equation.

Figure 3: indicate the scale.

-We will add a scale bar to the figure.

Figure 5 (caption): I think p=0.05 should be p<0.05.

-We will change this to p<0.05 in the captions to figures 5, 8 and 10.

Figures S1, S2, S3, S4 (captions, line 4): the sentence is incomplete for _1; however, I think it is enough to state that T is dimensionless time, which is defined in the text.

-We will simply write 'T (-) is dimensionless time' in these captions as suggested by the reviewer.

Page 9567, line 9: the value of 0.04 can be seen in Table S4, but not in Figure 7.

-This statement will be moved up to the discussion of Table S4.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 9551, 2014.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper