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Hydrology and Earth System Sciences Discussions

Interactive comment on "A novel explicit approach to model bromide and pesticide transport in soils containing macropores" *by* J. Klaus and E. Zehe

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We agree that allowing for n value larger than one is a "quick" as adsorption isotherms have a convex but not a concave shape. Our main reason for that is that the observed effective retardation coefficient of Isoproturon was close to one (compare Zehe and Fluehler 2001, page 11 of their manuscript). The main message of this exercise was to corroborate this finding with the model. When solute concentrations within the system are significantly smaller then one the increase of n leads to a decrease of the retardation to one. Another way of reducing adsorption is of course lower KF towards zero while keeping n smaller than one. We will test this opportunity within a couple of simulations and include the useful results in the manuscript.

We also extend the discussion and present which parameter combinations lead to the

successful solute model runs.

Finally we attached a figure of the sensitivity of the dispersion parameter. We tested a maximum D of 5.42E-7 m^2/s (blue) and a minimum value of 7.44E-8 m^2/s (red). These values were observed at a nearby field site at 24 hrs and 48 hrs after onset of a 5hrs irrigation (Klaus, unpublished data). This was accompanied by the presentation of the dispersion coefficient (5E-7, green) used in the modelling exercise. We know that tuning of D will lead to different and maybe better results, but we just wanted to showed that we are still able to reduce the number of behavioural model results based on a fixed D of a realistic value without additional calibration of solute transport. The manuscript will be extended by information of the measured values of D during the nearby experiment.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 991, 2011.

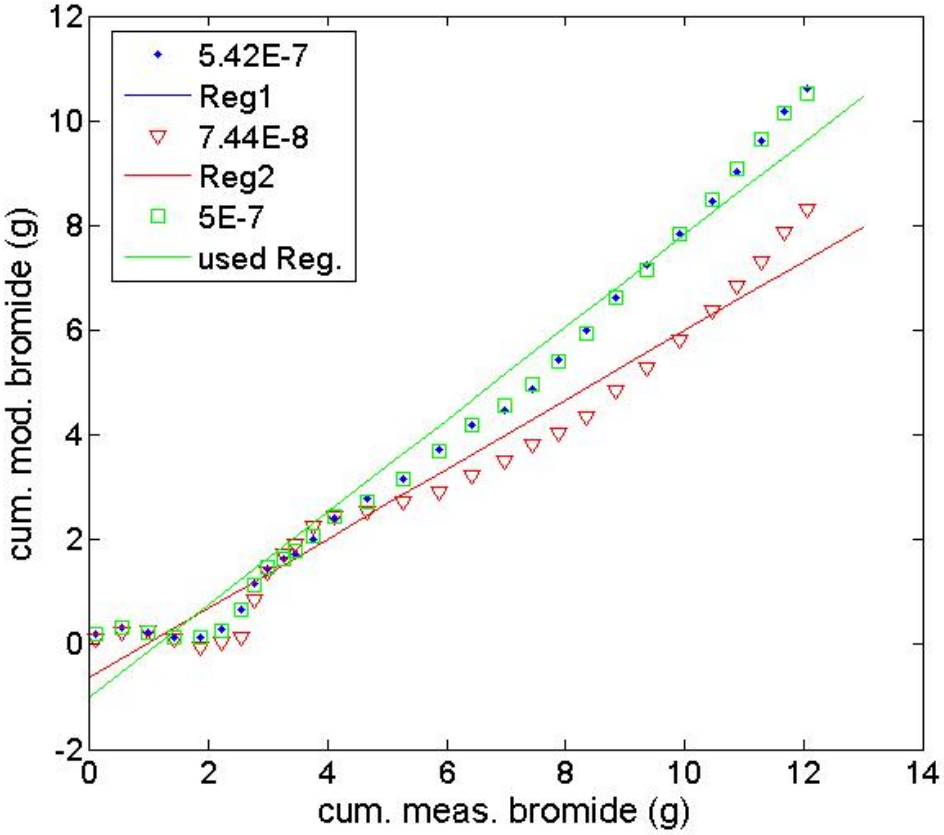

Fig. 1. Sensitivity of the dispersion parameter

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