Diffusion limited aggregation for solute transport modeling

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ABSTRACT

We utilize data from experiments performed within the EU-sponsored research HYDROMED (a research program on hill reservoirs in the semiarid Mediterranean periphery) on solute transport in the unsaturated zone to exemplify modeling potentials within a fractal theory framework. Dye data is compared to experiments with bromide and we show similarities between the two experimental frameworks. Solute transport properties as indicated from dye coverage experiments are used in a diffusion limited aggregation model. The diffusion limited aggregation model was calibrated and verified for 5 experimental plots. The verified model shows that agreement to observed data is satisfactory. The model is able both to reproduce a statistically homogeneous output as compared to the data. Both maximum penetration depth as well as overall spatial pattern and depth-coverage are well simulated.

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