

## **SIMULATION OF GRAVITY DOMINATED DNAPL INSTABILITIES IN SATURATED POROUS MEDIUM USING A PORE SCALE MODEL**

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**Summary.** In this study we present a pore-scale network model to simulate gravity dominated displacement of a wetting fluid (water) by a lower-viscosity DNAPL (trichloroethylene) in homogenous porous media. A typical geometric representation of the network model includes a regular cubic lattice structure with pore bodies corresponding to the vertices of the lattice, and pore throats connecting the pore bodies. Both size distributions of the pores bodies and pores throats are determined by a probabilistic approach that computes the distribution of the volume of the voids in packed spheres. The model is used to simulate laboratory experiments conducted on a glass column having a length of 68 cm and 10 cm of diameter, filled with medium quartz sand. The calculated arrival times of the DNAPL front are compared with those measured using optic fibre sensors placed at 8 points of the control section of the experimental device. Furthermore, the mean pressure of TCE measured during the experiment at the column inlet section was compared to the transient pressure predicted by the pore-throat-model. Globally, the numerical results obtained were in good agreement with the measurements.