

# A stochastic $p$ -adic model of the capillary flow in porous random medium

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## ABSTRACT

We develop [1] the  $p$ -adic model of propagation of fluids (e.g., oil or water) in capillary networks in a porous random medium. The hierarchic structure of a system of capillaries is mathematically modeled by endowing trees of capillaries with the structure of an ultrametric space. Considerations are restricted to the case of idealized networks represented by homogeneous  $p$ -trees with  $p$  branches leaving each vertex, where  $p > 1$  is a prime number. Such trees are realized as the fields of  $p$ -adic numbers. We introduce and study an inhomogeneous Markov process describing the penetration of fluid into a porous random medium.

## References

- [1] A. V. Antoniouk, K. Oleschko, A. N. Kochubei and A. Yu. Khrennikov, *Physica A*, 505 (2018), 763–777.