

Soldatova, Ekaterina Aleksandrovna; Keller, Alevtina Viktorovna

Algorithms and information processing in numerical research of the Barenblatt-Zhelto-Kochina stochastic model. (Russian. English summary) [Zbl 1486.76082](#)

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Summary: The paper investigates a model of pressure dynamics of a liquid filtered in a fractured-porous medium with random external action. It is based on the Cauchy-Dirichlet problem for the Barenblatt-Zhelto-Kochina stochastic equation. An algorithm for numerical research and information processing is presented, which provides for obtaining both degenerate and non-degenerate equations. The article describes an algorithm for the numerical solution of the Cauchy-Dirichlet problem for the Barenblatt-Zhelto-Kochina stochastic equation, which is based on the Galerkin method. Numerical study of the stochastic model implies obtaining and processing the results of n experiments at various values of a random variable, including those related to rare events. The main theoretical results that have made it possible to conduct this numerical study are the methods of the theory of degenerate groups of operators and the theory of Sobolev-type equations. Algorithms are represented by schemes that allow to build flowcharts of programs on their basis, for conducting computational experiments.

MSC:

76S05 Flows in porous media; filtration; seepage

Keywords:

Barenblatt-Zhelto-Kochina equation; numerical research; algorithm; Sobolev-type stochastic equation

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