Methods for improving filtration and numerical simulation of liquids in a two-phase (oil and gas) system in

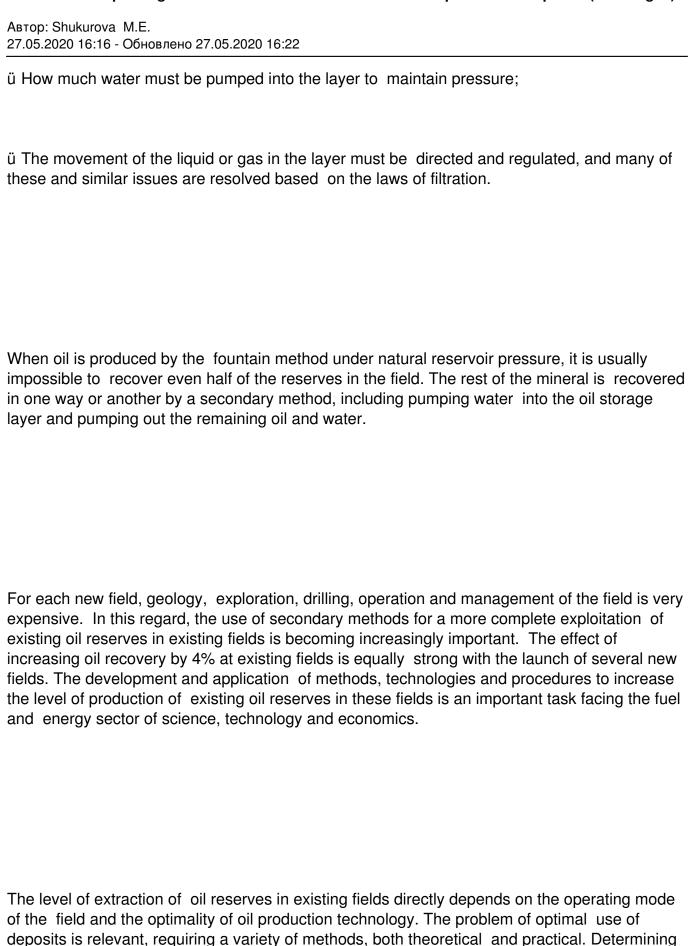
At present, the design and operation of new oil and gas fields, as well as the operation of wells,

ü Wells how many wells are in the reservoir and in what order they should be included;

cannot be imagined without applying filtration laws.

ü What mode of operation should be supported in them;

ü How to place wells in a given layer;



the order and technology of optimal use of the field using field experiments taking into account the characteristics of Iraq, minerals and mining is a complex technical problem associated with

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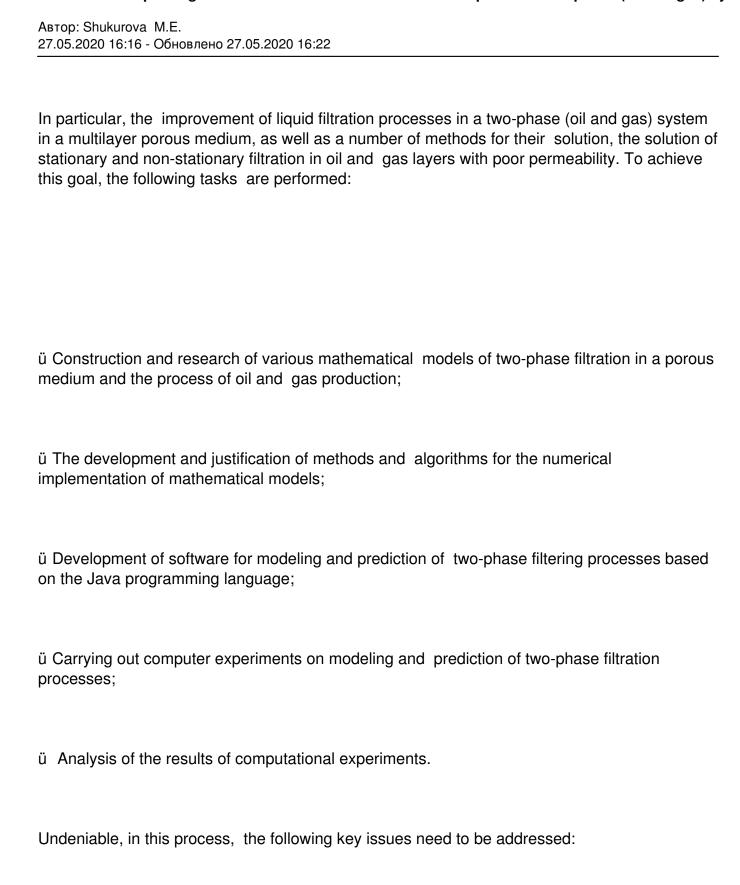
high material and energy costs. In addition, given that the characteristics of the rocks and minerals in each deposit may be unique, natural experiments will have to be carried out separately for each new deposit, and costs will increase in the future.

II. METHODOLOGY

Nowadays, the use of computer technology in scientific and technical research has expanded the possibilities of studying various objects, processes and phenomena based on their mathematical models. The speed and memory capacity of modern computers allow the use of more complex mathematical models to describe physical processes. Computer analysis of the process is not only much cheaper than natural experimental research, but also allows a more complete and deep study of the process.

The demand of our economy for energy sources such as oil is growing day by day. Therefore, the development of techniques, methods and technologies that increase the production of stratified oil in specific fields, theoretical foundations and practical application, the development of software for computer modeling of oil and gas production.

III. EXPERIMENTAL RESULTS



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ü Problems of two-phase filtration of immiscible liquids in a porous medium at different values □ □ of the physical characteristics of the oil-bearing layer and the filtered phases;
ü Mathematical expression of physical conditions in water, oil and gas wells and their numerica implementation;
ü Application of object-oriented programming technology in software development;
ü Carrying out computer experiments to simulate and predict the processes of oil and gas production and analysis of the results.
ü Various forms of generalization of Darcy's law, defined for homogeneous liquids for a two-phase flow;
ü The effectiveness of Java programming technology in software development;
Conclusion
Mathematical models of two-phase filtration processes, algorithms for their numerical solution and developed software can be used to study the processes of joint flow of immiscible liquids in a porous medium, to determine the optimal order of oil and gas extraction processes. In a multiphase flow, part of the pores of the medium is occupied by one phase of the liquid, and the rest by the second and, third phases



The concept of the saturation function of each phase is introduced to characterize the amount of each liquid in a porous medium. The required phase saturation function is defined as the ratio of the pore volume occupied by the phase to the total pore volume.

Literature

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