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Problems And Major Problems Of Mathematical Modeling Of The Process Of Fluid Movement In Non-Homismal Pool Floors

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ABSTRACT

Formulas for calculating the fluid flow rate in a well, the laws of pressure distribution in a straight radial motion in each zone in the horizontal and vertical directions.

KEYWORDS

Fluid, Porous Layer, Filtration, Flat-Radial, Coordination.

INTRODUCTION

Porous medium liquids process of joint movement of non-stationary mathematical model of same-sex and same-sex boundary conditions are not given specific derivative border issues written in the form of differential equations. Finding an analytical solution to such a problem is one of the more complex issues, even for the simplest case. As a result, the calculation of these issues Mathematical Modeling methods with the goal of solving. A boundary example like this Alarm simulation of a number of new high-

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performance computing methods, algorithms and software development requires.

ANALYSIS AND METHODOLOGICAL LITERATURE

There are now many mathematical models representing the filtration process of liquids and gases in a porous medium. In the development of these models, a number of foreign scientists, including Russian scientists Charny I.A., Tikhinov A., Samarsky A., Verigin N.N., Nikalayevsky V.N., Yanenko N.N., Marchuk G.I. and others, Uzbek scientists Kabulov V.K., Abutaliyev F.B., Fayzullayev B., Muhiddinov N., Sadullayev R. and other scientists made significant contributions. Effective filtration limit on the number of issues of modeling Tixinov A., A., Yanenko N.N., Abutaliyev F.B. and the other proved to be enough to create theories .

The theory of filtration of problems related to certain classes of differential - separate schemes to use is desirable. In particular, the pieces of the rock solve the issues of non-porous media filtration of liquids and gases, a phase during the second stage and Murakami trade filtration sector represents the best results in solving the border issue.

Modern numerical modeling methods that work effectively in PEHM are one of the new operational tools for scientific research. With the development of electronic computers and computer technology, porous environments, liquids filter serves to resolve the issues of great effect in the scheme of finite-ayirmali based on the number of impunity and differential separate scheme is based on the number of models. Limited separate scheme is based on one of the most widely used usullard an ordinary progonka way. This method is more efficient and less time with other forms of property.

In recent years, many new numerical and approximate analytical methods have been used and are being developed to solve differential equations and systems with special derivatives. For problems of filtration theory in some class, it is expedient to use differential separation schemes. Its difference from the finite difference method is that some of the products involved in the differential problem are not approximated by the finite difference operator. Differensial-ayirmali approximate solution to the issue of construction of a number of methods are available. In the solution of differential-differential boundary value problems, especially the application of the differential prognosis method gives good results.

DISCUSSION

Modern methods of computer modeling and effective application of light creates. The natural conditions of its oil or gas layers maxsuldor rare cases, same-sex. Porous key indicators of environmental values of the different parts of the layer are different , it is a rock not called.

In general, the motion of liquids in a non-homogeneous porous layer is relative to the parameters of the subsurface :

- *k (x, y)* - layer permeability coefficient;
- *m (x, y)* - layer porosity coefficient;
- *h (x, y)* is the coefficient of layer strength (thickness) .

A layer of rocks changes in its main parts of the conductivity on average the same as a will.

If homogeneous zones (fragments) in a layer are separated by a large size, the parameters of this non-homogeneous layer can significantly affect the properties of the filtration flow. For this reason, all macro variations can be divided into the following types:

- Homogeneity, the layer thickness of the layers in several tiers are divided into floors and other neighboring floor conductive Hanlon coefficient mean the same;
- Steakhouse (s) of the same sex, then layer onseveraldifferent permeability (a xilmasli k) zones (parts). Indeed, the same conduc tivity almost equal, but theneighboring zo nes difference.
- Each floor has a fluid motion between the current turnaround transitions are not line ar distribution of pressure occurs. Because the boundary pressure values Rk and Rg for all layers are the same and the pressure distribution in them does not depend on the permeability. It can be seen that the *x*- coordinate given in one plane is at the same values, the pressure in each layer of the layer must be the same :

$$P = P_k - \frac{P_k - P_\Gamma}{L} x$$

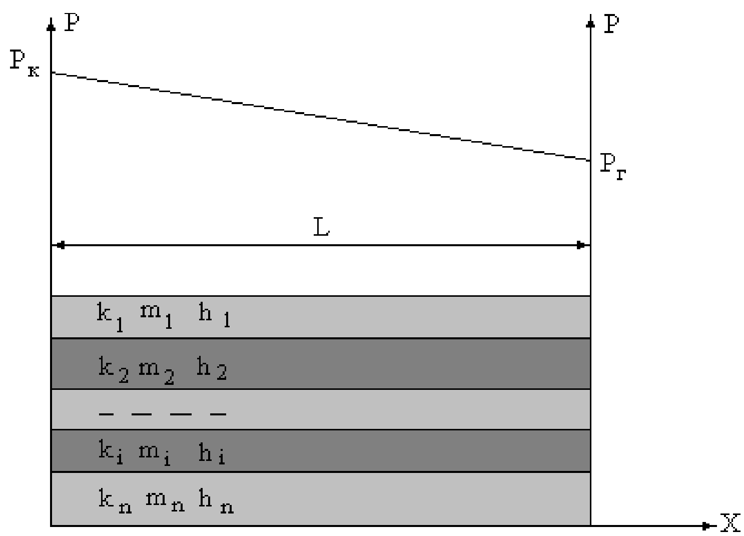

Figure 1.1 . Multiple layers of different vertical section of the movement of fluids and pressure distribution line (Rk - Rg)

In this case, the total consumption of the liquid (fluid) in the border layer considers every floor as the total spending (Figure 1.1):

$$Q = \sum_{i=1}^{n} q_i = \sum_{i=1}^{n} k_i h_i \cdot \frac{a(P_k - P_\Gamma}{\mu L}$$

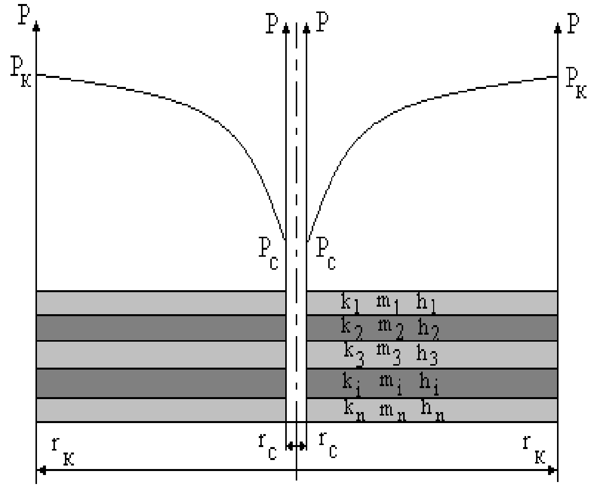

Figure1.2. Multiple layers of different fluids movement for a flat radial flow vertical cut and pressure distribution line (Rk - RG)

THE RESULT

In this case, the pressure distribution in the plane-radial motion of fluids has the appearance of a logarithmic relationship (Fig. 1.2) and is general (homogeneous) for all strata:

$$P = P_k - \frac{P_k - P_c}{\ln r_k / r_c} \cdot \ln r_k / r$$

The flow rate in the well is calculated by the following formula:

$$Q = \sum_{i=1}^{n} q_i = \sum_{i=1}^{n} k_i h_i \cdot \frac{2\pi}{\mu} \cdot \frac{(P_k - P_c}{\ln r_k / r_c}$$

(Lanes) into a movement of fluids in the rock layer

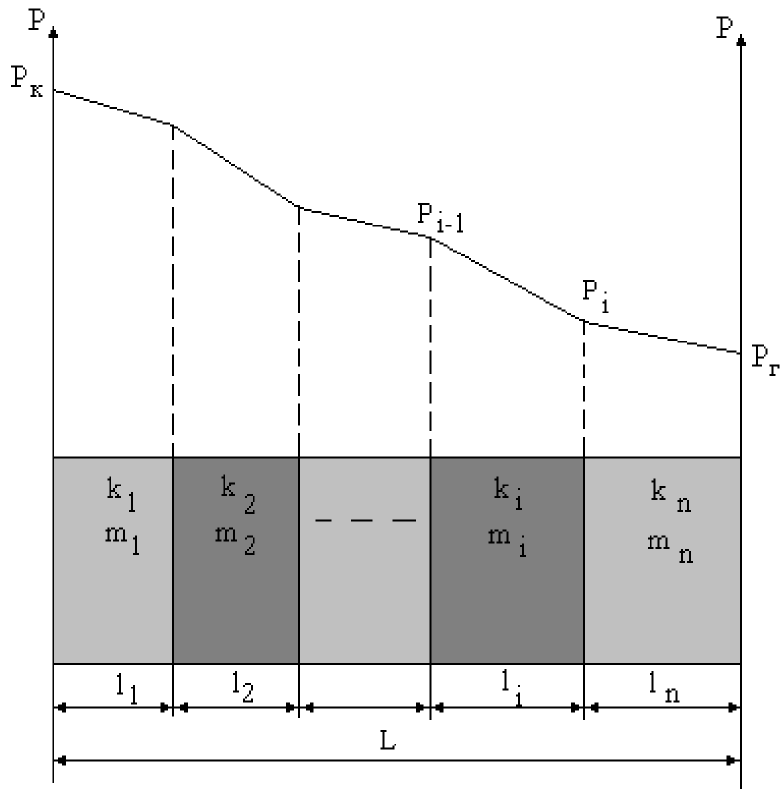

Figure 1.3. Vertical section and pressure distribution line for a rhythmic fluid in a zonal heterogeneous layer

In a zonal heterogeneous layer, the uniform pressure distribution in each zone is linear, and the pressure change is defined by the following expression.

$$P_i(x) = P_{i-1} - \frac{P_{i-1} - P_i}{l_i}.x$$

Here, $0 \le x \le l_i$, i.e. the *x*- coordinate is obtained only in the area under consideration. The graph of pressure distribution within each zone forms a straight line, generally across the layer - consisting of straight line segments, forming a broken line (Fig. 3).

Current consumption of the liquid formula is determined by:

$$Q = \frac{ah}{\mu}.\frac{P_\kappa - P_\Gamma}{\sum_{i=1}^{n} \frac{l_i}{k_i}}$$

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Figure 1.4. Vertical cross-section and pressure distribution line for a straight radial flow in a zonal heterogeneous layer At the same time in each zone even distribution of pressure in the radial motion logarithmic law (Figure 4):

$$P_i(r) = P_i - \frac{P_i - P_{i-1}}{\ln r_i / r_{i-1}} . \ln r_i / r$$

The flow of fluid in the well with the consumption of the following formula is determined by:

$$Q = \frac{2\pi h}{\mu} . \frac{P_\kappa - P_c}{\sum_{i=1}^{n} \frac{1}{k_i} . \ln r_i / r_{i-1}}$$

In general, the lanes of same -sex non- porous layers of fluid or gas movement is much more complex process oftheir mathematical modelsof vertical or horizontal direction on the permea bility and porosity values of coefficients for each zone differs greatly from one another. As a result of such filtration much more complex, the number of effective methods of solving problems without solving desirable.

CONCLUSION

The process of fluid motion, problems and mathematical models of mathematical models when there is a strong variable coefficient in the zones of non-homogeneous porous layers. Consumption of liquid flow in the shaft calculation formulas, the horizontal and vertical directions of each zone is a flat radial pressure distribution laws of motion.

K (x, y) - layer permeability coefficient for the filtration process of liquids in the zones; *m (x, y)* - layer porosity coefficient; It is emphasized that the effect of the coefficient of *h (x, y)* - layer strength (thickness) is of great importance.

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