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A METHOD FOR THE NUMERICAL SOLUTION OF THE HEAT CONVECTION

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For the numerical solution of incompressible flows are widely used methods based on approximation of the Navier-Stokes equations written in the variables "stream function-vorticity» ((ψ,ω)). The attractiveness of the consideration of the Navier-Stokes equations in the variables (ψ,ω) lies in the fact that it is possible to reduce the number of equations in physical variables "velocity vector, pressure," and identically satisfy the law of conservation of mass.

The greatest difficulty in considering the incompressible fluid equations in the variables (ψ,ω) is the lack of boundary condition for the vorticity in the formulation of the differential problem corresponding to the slip condition and impermeability at the solid boundaries.

The problem of heat convection is formulated as follows:

$$\frac{\partial}{\partial x_1}\left(\frac{\partial \psi}{\partial x_2}\omega\right)-\frac{\partial}{\partial x_2}\left(\frac{\partial \psi}{\partial x_1}\omega\right)=\frac{1}{Re}\Delta\omega-\frac{Gr}{Re^2}\theta_{x_2};$$

$$\Delta\psi=\omega;$$

$$\left(\theta\frac{\partial \psi}{\partial x_2}\right)_{x_1}-\left(\theta\frac{\partial \psi}{\partial x_1}\right)_{x_2}=\frac{1}{Pr\,Re}\Delta\theta.$$

with initial and boundary conditions

$$\psi\big|_{t=0}=\psi_0(x_1,x_2),\ \ \omega\big|_{t=0}=\omega_0(x_1,x_2),\ \ \theta\big|_{t=0}=\theta_0(x_1,x_2)$$

$$\psi_{0,j}=0,\ \psi_{N,j}=0,\ \psi_{i,0}=0,\ \psi_{i,N}=0$$

$$\omega_{0,j}=\frac{2}{h_1}\psi_{x_1,0,j},\ \omega_{N,j}=-\frac{2}{h_1}\psi_{\bar{x}_1,0,j},\ \omega_{i,0}=\frac{2}{h_2}\psi_{x_2,i,0},\ \omega_{i,N}=-\frac{2}{h_2}\psi_{\bar{x}_2,i,N}+1$$

$$\theta_{0,j}=x_2,\ \theta_{N,j}=x_2,\ \theta_{i,0}=0,\ \theta_{i,N}=1$$

Main results of the research are computational algorithm, designed on the basis of presented model, and main technological parameters distribution analysis.

References

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INNOVATIVE TECHNOLOGY IN PROVIDING HEALTH CARE AT THE VILLAGE

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Health status determines the measure of social-economic, cultural and industrial development of the country.

The main goal of public health policy is to improve population health by ensuring access to health care; more of them by creating legal economic and organizational conditions of service, types, quality and volume of which correspond to the level of illness and the needs of the population, the current level of development of medical science.

Climatic and geographic features of Kazakhstan (area of 2 million 724.9 thousand km² and ranks 9th in the world. The annual changes in temperature from -57 to +49 C0; population density of 6-1 km 2), as well as demographics (over 40% of the population live in rural areas) dictate the need for modernization of primary care in rural areas, to improve access and quality provision of medical services.