Filina A. A. (Scientific research center of supercomputers and neurocomputers, Taganrog, Russia), **Chistyakov A. E., Nikitina A. V., Bondarenko D. V.** (Don State Technical University, Rostov-on-Don, Russia). **Research the accuracy of numerical solution of the diffusion-convection problem with fluctuating values**[1]**.**

Let's consider the diffusion-convection problem in the form $u'_t + vu'_x = ku''_{xx} + f$, $0 < x < l$, $t > 0$, with the initial $u(x,0) = u_0(x)$ and boundary $u(0,t) = 0$, $u(l,t) = 0$, $t > 0$ conditions.

The theorem. Under the conditions of the existence of a solution to the diffusion-convection equation, presented as a series $u \simeq \sum_{m=1}^{\infty} C_m^u(t)\sin(\omega m x)$, $\omega = \pi/l$ at approximation to the convection vu'_x and diffusion ku''_{xx} transfer operators by the fourth-order precision scheme $v(-u_{i+2}+8u_{i+1}-8u_{i-1}+u_{i-2})/(12h)$ and $k(-u_{i+2} + 16u_{i+1} - 30u_i + 16u_{i-1} - u_{i-2})/(12h^2)$, h is the discretization parameter, $i = \overline{2, N-2}$accordingly, the relative error has the form: $\alpha(r) = 1 - (8\sin(\pi/r) - \sin(2\pi/r))/(6\pi/r)$, $\beta = 1 - (15 - 16\cos(\omega mh) + \cos(2\omega mh))/6(\omega mh)^2$, where r is the number of computational nodes, $r = \pi/\omega mh$.

СПИСОК ЛИТЕРАТУРЫ

[1] A.I. Sukhinov, Y.V. Belova, A.E. Chistyakov. "Modeling Biogeochemical Cycles in Coastal Systems of the South of Russia". *Math Models Comput Simul.* **13**:6, 930–942 (2021). DOI:10.1134/S2070048221060223.

[1] The study was supported by the Russian Science Foundation grant No. 21-71-20050.