

On three layer difference scheme of parallel calculation for solving of parabolic-type system of equations

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The mixed problem with first order boundary conditions for systems of equations of parabolic type is considered

$$B \frac{\partial u}{\partial t} = Lu + f,$$

where B - positively defined, symmetric and bounded matrix, L - strong elliptic operator with variable coefficients, containing the mixed derivatives, $u = (u^{(1)}, u^{(2)}, \dots, u^{(n)})$, $f = (f^{(1)}, f^{(2)}, \dots, f^{(n)})$ - n -dimensional vectors. Constructed three-layer factorized scheme, whose solution requires no inversion of matrix B . For difference scheme the aprioristic estimation on layer $0^{(1)}$ in norm of mesh space W_2 is received, on which basis convergence of solution of the difference scheme to the solution of an initial problem is proved. The received algorithms can be effectively used for parallel computing systems. Calculations on a cluster for two-dimensional test problem are carried out.