ON THE 3D STOKES FLOW

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In the paper the 3D problem for the non-stationary Stokes flow in the infinite cylindrical and prismatic areas is studied. We admit that the pressure can be controlled and depends on time exponentially. The linear Stokes system is considered with the appropriate initial-boundary conditions. By means of the integral equation method the system is equivalently reduced to the system of integral equations with the weakly singular kernel. The existence and uniqueness of solution is obtained, if the power at the exponent satisfies the certain conditions. The exact solutions are obtained by means of the stepwise approximation method. Several examples are given.

Hence the solution of the Stokes non-stationary system is obtained in a cylindrical and prismatic pipes when their cross section is an arbitrary simply-connected region bounded with the piecewise smooth line