MICROCONVECTION APPEARANCE
IN A FLAT LAYER WITH A FREE BOUNDARY

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The system of equations, which was called in [1] a model of microconvection, could be obtained from the equations of compressible heat-conducting liquid motion [2] with the equation of state $\rho = \rho_0(1 + \beta\theta)^{-1}$, where $\rho_0 > 0$ is a constant. The unknown functions $\tilde{\mathbf{w}}(\tilde{\mathbf{x}}, t)$, $q(\tilde{\mathbf{x}}, t)$ are connected with the original velocity vector $\tilde{\mathbf{u}}(\tilde{\mathbf{x}}, t)$ and pressure $p(\tilde{\mathbf{x}}, t)$ by relations

$$\tilde{\mathbf{u}} = \tilde{\mathbf{w}} + \beta\chi\nabla\theta, \quad p = \rho_0 q + \beta\chi[\lambda + \rho_0(\nu - \chi)]\Delta\theta.$$

The pictures should be saved as "eps" files and should be inserted in text with the following command [3]
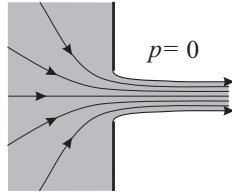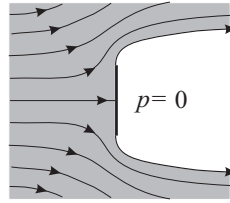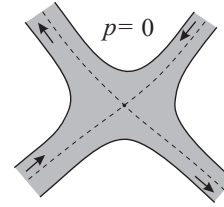

Рис. 1.1   Рис. 1.2   Рис. 1.3

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References:

1. Pukhnachov V.V. Model of convective flow at low gravity// Modeling in mechanics. 1992. Vol. 6 (23). No 4. PP. 47–56. [in Russian]

2. Moseenkov V.B. Qualitative methods of studying problems of convection of a viscous weakly compressible fluid, Inst. Mathematics, National Acad. of Sci. of Ukraine, Kiev (1998), 280 p. [in Russian]

3. Andreev V.K., Bekezhanova V.B. Appearance of microconvection in a flat layer: Preprint No 1–01 ICM SB RAS. Krasnoyarsk, 2001. 38 p. [in Russian]

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