

Semi-annual report of “Applied mathematics” department of IMM for 2018

On scientific activity.

The staff of “Applied mathematics” department consists of 6 employes:

2 prof:doct.phys.math.sci., 1 cond.of techn.sci., sen.res.ass., 3 laboratory assisstans and 1 engineer.

In she first Semi- annual in she department scientific researches are carried out

In two themes .

Theme 1: Principles of viscous fluid hydrodynamics with reqard to physical media in nano-systems.(doct.phys.math.sci.prof.Aliyev G.G.).

Work A. Mathematical. Simulation of the motion of viscous fluid with regard quantum-mechanical effects in nano tubes.

Mathematical-physical model of sliding condition of a viscous fluid in the wall boundary with regard to quantum-mechanical effects in nanotules (generalized Navier model) was offered

$$v(r) = a + b \cdot \frac{\partial v}{\partial r}$$

It was proved that the sliding velocity of the fluid in the pipe wall is in the form of the sum of three velocities: the first velocity appears from the inhomofeneity of the fluid and equals $v_1 = v_0 + (R_0 - \Delta - r_0) \cdot \frac{dv}{dr}$

The second velocity is formed by the internal length $\Delta = 0,12 \cdot R_0$ of sliding of the fluid between spaces and fluid and equals $v_2 = \Delta \cdot \frac{dv}{dr}$

The third velocity is formed by the external length of sliding of the velocity diagram of the complete system of the fluid and was offered by Navier in the form $v_3 = L_0 \cdot \frac{dv}{dr}$

Work B. Elaboration of intellectual systems in general toxicology, elaboration of monitoring system and carrying out experiments on statistical materials (cand. techni. sci. lead. res. ass. Mirzazadeh.I.M.).

Stage1. Elaboration of monitoring system and carrying out experiments on statistical materials. Intellectual-information system of monoxide gas poisoning was elaborated, a program package of the system was prepared and adequacy of the experimental system was affirmed.

Theme2. Integral simulation of fietration systems in oil-gas recovery.

(doct. phys. math. sci.prof.Aliyev G.G., cand.techn.sci. sen. res. ass. Abbasov.E.M.).

Work A: Integral simulation of gas wall in production prosses (cand.techn.sci. sen. res. ass. Abbasov.E.M.).

Gaslif was in 1 deptn was considered. The gas was injected from annular space. The monstationary motion equations of fluid-gas system was composed, differential equations were obtained and they were solved.

Work B: Solving the problem of stability of marine ships by the information synergetic theory method.(docd.phys.math.sci.prof. Nagiyev.F.B.).

It was proved that starting from 250 seconds in the ship, the behavior of vibrations takes stable chaotic form. This, calculation of the values of eutropy and megentropy enables to pedict initiaton of changes in the character of vibration and parametric resonance of the ship.

On organisational activity.

A seminar is conducted twice a month. The talk of department collaborates or from other institutions are discussed. Department collaborates take part with lectures at seminars and scientific conferences. The collaboratos take an active part at social events of the republic. Aliyev Gabil is the co-chairman of Higher Attestation Commission on mechanics and mathematics under the President of the Republic of Azerbaijan. Mirzazadeh Irade is the chairman of Trade Unions at IMM.

Prof Head of “Applied Mathematics” department **doct.phys.math.sci.G.G.Aliyev**