

NATIONAL  
ACADEMY  
OF SCIENCES  
OF UKRAINE

PIDSTRYHACH  
INSTITUTE OF  
APPLIED PROBLEMS  
OF MECHANICS AND  
MATHEMATICS

# MATHEMATICAL METHODS and PHYSICOMECHANICAL FIELDS

SCIENTIFIC JOURNAL

FOUNDED IN 1975

**Vol. 54, No. 1**

**L'viv 2011**

---

---

## CONTENTS

|   |    |
|---|----|
| <i>Hachkevych O. R., Kushnir R. M., Chaplya Ye. Ya.</i> On scientific and scientific-organizational activity of corresponding member of NAS of Ukraine<br><i>Ya. Yo. Burak</i> (to the 80-th birth anniversary) . . . . . | 7  |
| <i>Ptashnyk B. Yo., Tymkiv I. R.</i> Multipoint problem for parabolic equation with variable coefficients in a cylindrical domain . . . . .   | 15 |
| <i>Ivanchov M. I.</i> Free boundary problem for two-dimensional parabolic equation .  | 27 |
| <i>Kutniv M. V., Makarov V. L.</i> Compact difference schemes of high accuracy order . . . . .  | 36 |
| <i>Savenko P. O., Protsakh L. P.</i> Numerical solutions of two-point boundary problem with nonlinear two-dimensional spectral parameter . . . . .  | 48 |
| <i>Bodnar D. I., Zatorsky R. A.</i> Generalization of continued fractions. I . . . . .  | 57 |
| <i>Burak Ya. Yo., Hachkevych O. R., Solodyak M. T.</i> Mathematical descriptive model for radio nuclide electrodiffusion in avalanche-type fuel containing materials . . . . .  | 65 |
| <i>Chaplya Ye. Ya., Chernukha O. Yu., Bilushchak Yu. I.</i> Contact initial-boundary-value problem of admixture particle diffusion in a two-phase stochastically non-homogeneous laminated strip . . . . .                | 79 |
| <i>Kondrat V. F., Hrytsyna O. R.</i> Relations of gradient thermomechanics taking into account the irreversibility and inertia of local displacement of mass .  | 91 |
|   | 5  |

|   |     |
|---|-----|
| <i>Zhuk Ya. A., Senchenkov I. K., Vasilyeva L. Ya.</i> Influence of microstructural transformations on the stress-strain state of locally irradiated steel disk . .   | 101 |
| <i>Voloshko O. I., Lapusta Y. M., Loboda V. V.</i> Construction of approximating function in the pre-fracture zone for crack in adhesive layer between two isotropic materials . . . . .  | 116 |
| <i>Osadchuk V. A., Tsybalyuk L. I., Dzyubyk A. R.</i> Determination of triaxial distribution of residual stresses in weld joints of structural elements with rectangular seams and estimation of their influence on joint strength taking into account crack-type defects . . . . . | 131 |
| <i>Halazyuk V. A., Kit H. S.</i> Axisymmetric stress-strain state of a body with plane sheet of thermal sources . . . . .   | 141 |
| <i>Horechko N. O., Kushnir R. M.</i> Thermostressed state of composite plate with heat exchange under action of uniformly distributed heat source . . . . .   | 153 |
| <i>Yevtushenko A. A., Pyryev S. Yu.</i> Solution of quasi-static thermoelasticity problem for semi-space with locally distributed on the surface moving mechanical and thermal load . . . . .   | 163 |
| <i>Karnaukhov V. G., Kozlov V. I., Karnaukhova T. V.</i> Influence of dissipative heating on active damping of forced resonance vibrations of flexible viscoelastic cylindrical panel by piezoelectric actuators . . . . .  | 175 |
| <i>Shul'ga M. O.</i> Application of Hamiltonian formalism in the Timoshenko-type theory of plate vibrations . . . . .   | 189 |
| <i>Vetrov O. S., Shevchenko V. P.</i> Investigation of the stress-strain state of orthotropic shells under the action of dynamic impulse load . . . . .   | 196 |
| <i>Popov V. G.</i> Iterative method of diffraction field determination at interaction of longitudinal shear wave with a crack system . . . . .  | 204 |
| <i>Povstenko Y. Z.</i> Non-axisymmetric solutions to time-fractional heat conduction equation in a half-space in cylindrical coordinates . . . . .  | 212 |
| <i>Yankovskii A. P.</i> Definition of effective coefficients of thermal conductivity of complex reinforced polyfoam on the basis of power criterion of equivalence . . . . .  | 220 |
| NEW ITEMS AND INFORMATION   |     |
| <i>To the 85-th birth anniversary of academician V. V. Panasyuk . . . . .</i>   | 232 |
| <i>To the 80-th birth anniversary of professor M. Yu. Shvayko . . . . .</i>   | 234 |