

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. 63, No. 4**

**L'viv 2020**

---

---

## CONTENTS

<i>Ilkiv V. S., Strap N. I., Volyanska I. I.</i> Nonlocal boundary value problem for a equation with differentiation operator $z \partial/\partial z$ in a refined Sobolev scale .	5
<i>Pukal's'kyi I. D., Yashan B. O.</i> Multipoint boundary value problem of optimal control for parabolic equations with degeneration . . . . .	17
<i>Kolun N. P.</i> Asymptotic behavior of some types of solutions of differential equations with different types of nonlinearities . . . . .	34
<i>Pyrch N. M.</i> On graphs and $M$ -equivalence . . . . .	46
<i>Kunynets A. V., Kutniv M. V., Homenko N. V.</i> Three-point difference schemes of high accuracy order for Sturm – Liouville problem . . . . .	54
<i>Topolyuk Yu. P.</i> Convergence of the regularization method for finding a normal quasi-solution in problems with free phase with a completely continuous operator . . . . .	63
<i>Kit H. S., Ivas'ko N. M.</i> Two-dimensional problem of thermoelasticity for a half-space with a free, rigidly, smoothly or flexibly clamped boundary subjected to heat sources. . . . .	73

<i>Hachkevych O. R., Matyash I. Ye., Minaylova I. A., Mishchuk O. M., Serdega B. K., Terlets'kyi R. F., Brukhal' M. B.</i> Mathematical modeling and polarimetry of the thermal stress state in semitransparent solid taking into account the influence of thermal radiation . . . . .	81
<i>Aghalovyan L. A., Ghulghazaryan L. G., Kaplunov J. D., Prikazchikov D. A.</i> 3D dynamic analysis of layered elastic shells . . . . .	96
<i>Kamins'kyi A. O., Dudyk M. V., Reshitnyk Yu. V., Fen'kiv V. M.</i> Investigation of the initial stage of fracture of a piece-homogeneous body with interface crack under compression along the interface . . . . .	109
<i>Kryven' V. A., Valiashek V. B., Tsymbaliuk L. I., Blashchak N. I.</i> Elastic-plastic problem for a thin one sided exfoliated inclusion under the shear loading . . . . .	122
<i>Yakovenko N. D., Senchenkov I. K.</i> Numerical simulation of the surface hardening of a half-space under thermal pulse loading with taking into account the dependences of inelastic properties on the phase composition of a material . . . . .	128
<i>Chekurin V. F., Khymko O. M.</i> Mathematical models for integrity control of linear part of main gas pipelines . . . . .	139
NEW ITEMS and INFORMATION	
<u><i>Hryhoriy Semenovych Kit (05.03.1930–11.12.2020)</i></u> . . . . .	150
ALPHABETICAL INDEX for 2020 (vol. <b>63</b> ) . . . . .	152