

Table of Contents

Preface and Organizing Committee

Experimental-Theoretical Research of Mechanical Properties of Perforated Composite Sandwich Panels

A.N. Anoshkin, V.Y. Zuiko, A.V. Tchugaynova and E.N. Shustova 1

Estimation of Salt Rocks' Long-Term Strength in Natural Conditions

A.A. Baryakh, S.Y. Lobanov and I.S. Lomakin 11

Mathematical Modeling of Underworked Rock Strata Failure Process

A.A. Baryakh and N.A. Samodelkina 17

Optimal Control of Vitrifying Polymers Cooling Process to Reduce Residual Stresses

M.G. Boyarshinov and I.N. Boyarshinova 23

Experimental Study of Nonlinear Effects under Torsion of the Uniform Cylinder with Initially Circular Cross Section

V.P. Bachurikhin, I.E. Keller, A.F. Merzlyakov and M.A. Yurlov 29

Analysis of Thermal Conditions within the Flow Conduits of MHD-Devices

I. Glot, V.P. Matveenkov, S. Khripchenko and I. Shardakov 35

Simulation of the Energy Balance in Metals under Irreversible Deformation

A.A. Kostina and O.A. Plekhov 43

Effect of Boundary Conditions on the Hydroelastic Vibrations of Two Parallel Plates

S.A. Bochkarev and S.V. Lekomtsev 51

Analysis of Transient Thermal Processes in the Steel Billet at Different Regimes of Air Cooling

S.V. Lekomtsev and I.N. Shardakov 59

The Optimal Placement of the Piezoelectric Element in a Structure Based on the Solution of the Problem of Natural Vibrations

N.V. Sevodina, N.A. Yurlova and D.A. Oshmarin 67

Finite-Element Modeling of Plastic Working of Steel Billets

A.A. Rogovoy and N.K. Salikhova 75

Numerical Modelling of Layered Composite Materials with Embedded Optical Fiber Sensors

V.V. Korepanov, G.S. Serovaev and N.A. Yurlova 83

Analysis of Cracking in a Reinforced Concrete Beam

A. Bykov, V.P. Matveenkov, G. Serovaev, I. Shardakov and A. Shestakov 89

Determination of Thermography Modes for Recording Delamination between Composite Material and Reinforced Concrete Structures

A. Bykov, I. Shardakov and A. Shestakov 97

The Hydrostatic Level Method for Continuous Monitoring of Building Foundations

I.N. Shardakov, A.P. Shestakov, R.V. Tsvetkov and V.V. Yepin 105

Mechanical and Microstructural Aspects of Localized Plastic Flow

M. Sokovikov, V. Chudinov, D. Bilalov, V. Oborin, S. Uvarov, O. Plekhov, Y. Bayandin and O. Naimark 113

Characterization of Microstructure of Fibrous Composites Using High-Order Correlation Functions

M. Tashkinov 121

Quantum Field Theory Approach to Mechanics of Polycrystals

V. Shavshukov and A.A. Tashkinov 131

Numerical Method for Solving the Problem of Thermomechanics of Polymeric Environment in Conditions of Phase Transition

R.G. Kulikov, T.G. Kulikova and N.A. Trufanov 139

Evolution of Stresses in the Bolted Connection Node of Viscoelastic Composite Plates

A.Y. Gorokhov and N.A. Trufanov 147

Multilevel Models of Polycrystalline Metals: Application for Cyclic Loading Description

P.V. Trusov, P.S. Volegov, A.I. Shveykin and D.S. Gribov 155

Research of the Damage and Failure Processes of Composite Materials Based on Acoustic Emission Monitoring and Method of Digital Image Correlation

V.E. Wildemann, E.V. Spaskova and A.I. Shilova 163