

1. Record Nr.	UNISA996499863503316
Titolo	Advances in solid and fracture mechanics : a liber amicorum to celebrate the birthday of Nikita Morozov / / edited by Holm Altenbach [and five others]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-031-18393-2
Descrizione fisica	1 online resource (302 pages)
Collana	Advanced Structured Materials Ser. ; ; v.180
Disciplina	910.5
Soggetti	Fracture mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Preface -- Contents -- List of Contributors -- Chapter 1 On Forced Vibrations of Orthotropic Plates in the Presence of Internal Friction -- 1.1 Introduction -- 1.2 The Formulation of the Problem and Basic Equations -- 1.3 The Solution to the External Problem -- 1.4 On Mathematically Precise Solutions -- 1.5 Conclusions -- References -- Chapter 2 Asymmetric Buckling of Orthotropic Plates Under Normal Pressure -- 2.1 Introduction -- 2.2 Problem Formulation -- 2.3 Equations for Buckling -- 2.4 Numerical Results -- 2.5 Conclusion -- References -- Chapter 3 On Ladyzhenskaya's Inequality and its Applications -- 3.1 Introduction -- 3.2 Preliminaries -- 3.2.1 Some Standard Inequalities -- 3.2.2 Functions of Compact Support -- 3.3 Ladyzhenskaya's Inequality in Two Dimensions -- 3.4 Ladyzhenskaya's Inequalities in Three Dimensions -- 3.4.1 First Result -- 3.4.2 Second Result -- 3.5 Further Possible Applications -- 3.6 Conclusions -- References -- Chapter 4 Mechanical Behaviour of Nonwovens: Continuous Approach with Parametric Finite-element Modelling -- 4.1 Introduction -- 4.2 Background -- 4.3 Parametric Finite-element Modelling Strategy -- 4.4 Multiscale Experimental Characterisation -- 4.4.1 Calendered Fabrics -- 4.4.2 Experimental Methods -- 4.5 Generation of Calendered-fabric Model -- 4.5.1 Computation of Local Mechanical Properties -- 4.5.2 Meshing -- 4.5.3 Failure Criterion -- 4.6 Results and Discussion -- 4.6.1 Developed Models and Validation

-- 4.6.2 Effect of Load Direction -- 4.6.3 Effect of Fabric Size -- 4.6.4 Effect of Bond Pattern -- 4.7 Conclusions -- References -- Chapter 5
Free Vibrations of a Cylindrical Shell Closed with the Cap -- 5.1
Introduction -- 5.2 Numerical Results -- 5.3 Basic Equations -- 5.4
Asymptotic Solution for the Plate-like Vibrations -- 5.5 Asymptotic
Solution for the Shell-like Vibrations.
5.6 Vibrations of the Third (Beam-like) Type -- 5.7 Spectrum
Optimization by Thickness Variation -- 5.8 Conclusions -- References
-- Chapter 6 Indentation of an Absolutely Rigid Thin Inclusion into One
of the Crack Faces in an Elastic Plane Under Slippage at the Ends -- 6.1
Introduction -- 6.2 Statement of the Problem and Derivation of the
Governing System of Integral Equation -- 6.3 Numerical Analysis -- 6.4
Conclusion -- References -- Chapter 7 Biomechanics as a Basis for
Clinical Decision Support Systems in the Surgery of the Spine-pelvic
Complex -- 7.1 Introduction -- 7.2 Noninvasive Method of Obtaining
Bone Tissues Mechanical Properties by Computer Tomography -- 7.2.1
Results of Experiments on Scanning Samples of the Femoral Heads
Spongy Bone in a Computer Tomograph -- 7.2.2 Results of Uniaxial
Compression Mechanical Experiments of Femoral Heads Spongy Bone
Samples -- 7.3 Sagittal Balance and its Relation to Vertebral-pelvic
Complex Biomechanics -- 7.4 Quantitative Criteria for Assessing the
Success of Surgical Treatment -- 7.5 Geometric Criteria for Evaluating
the Success of Spinal Surgery -- 7.6 Geometric Criteria for Assessing
the Success of Hip Replacement -- 7.7 Biomechanical Criteria for
Evaluating the Success of Treatment: Assessment of Mechanical
Strength, Fixation Stability, Implant Life -- 7.8 Results of the Pilot
Implementation of Biomechanical Modeling in the Process of
Preoperative Planning -- 7.8.1 Development of the Accord Software
Platform -- 7.8.2 Substantiation of the Effectiveness of Biomechanical
Modeling in Preoperative Planning -- 7.8.3 The Concept of Clinical
Decision Support Systems with Biomechanical Support -- 7.9
Conclusion -- References -- Chapter 8 Dispersion of the Bending Wave
in a Fluid-loaded Elastic Layer -- 8.1 Introduction -- 8.2 Basic
Equations -- 8.3 Dispersion Relations -- 8.4 Asymptotic Expansions.
8.5 Concluding Remarks -- References -- Chapter 9 Mathematical
Models of Local Ice Strength and Problems Elastic-plastic Bending of
Hydraulic Structures Supports -- 9.1 Introduction -- 9.2 Complex
System "Borehole Jack" -- 9.3 Methodology for Determination of the
Local Ice Strength at Compression in Boreholes by a Borehole Jack --
9.4 Anisotropy of Ice -- 9.5 Estimation of Ice Pressure on the Vertical
Supports of Hydraulic Structures, Taking into Account the Local Ice
Strength -- 9.6 Conclusions -- References -- Chapter 10 Stress
Distribution at the Wavy Surface of a Solid Incorporating Surface
Stresses and Surface Tension -- 10.1 Introduction -- 10.2 Problem
Formulation -- 10.3 Boundary Equation for Complex Potentials -- 10.4
Boundary Perturbation Method -- 10.5 Numerical Results -- 10.6
Conclusions -- References -- Chapter 11 Analytical and Numerical
Methods for Analysis of Stress Singularity in Three-Dimensional
Problems of Elasticity Theory -- 11.1 Introduction -- 11.2 Analysis of
Stress Singularity Based on the Constructed Analytical Eigensolutions
for Semi-infinite Circular Conical Bodies -- 11.3 Numerical-analytical
Method of Stress Singularity Analysis at the Vertices of Circular and
Non-circular Conical Bodies -- 11.4 Finite Element Analysis of Stress
Singularity in Three-dimensional Problems of Elasticity Theory -- 11.5
Conclusion -- References -- Chapter 12 On Estimating Prestress State
in an Elastic Cylinder -- 12.1 Intro -- 12.2 Linearized Deformation
Model for a Prestressed Body -- 12.3 Weak Problem Statement for
Prestressed Cylinder -- 12.4 Sensitivity Analysis -- 12.5 Comparison of

Analytical and FE Prestress Fields -- 12.5.1 Initial Inflation -- 12.5.2 Initial Axial Tension -- 12.5.3 Initial Torsion -- 12.6 Inverse Problem of Prestress Identification -- 12.6.1 Problem Statement -- 12.6.2 Problem Solution.
12.6.3 Computational Experiments -- 12.7 Conclusion -- References -- Chapter 13 A Method of the JR-curve Determination Using Linear Normalization -- 13.1 Introduction -- 13.2 Statement of the Problem -- 13.3 Obtaining the Solution -- 13.4 Examples of Application of the Method and Analysis of Results -- 13.5 Conclusion -- References -- Chapter 14 Application of Galerkin's Method to Buckling of Functionally Graded or Stepped Columns -- 14.1 Introduction -- 14.2 The Clamped-Free Column -- 14.3 Buckling of a Heavy Simply Supported-Sliding Column -- 14.4 Buckling of a Stepped Column Under Axial Load -- 14.4.1 Galerkin Solution: First Version -- 14.4.2 Galerkin Solution: Second Version -- 14.5 Buckling of a Heavy Stepped Column -- 14.5.1 Exact Solution -- 14.5.2 Galerkin Solution -- 14.6 Conclusion -- References -- Chapter 15 Inter-laminar Delamination in Composite Laminates: Role of Buckling in its Growth -- 15.1 Introduction -- 15.2 Mathematical Preliminaries -- 15.3 Numerical Results -- 15.4 Conclusions -- References -- Chapter 16 Suppression of Oscillations of a Loaded Flexible Robotic "Arm" as a Generalized Chebyshev Problem -- 16.1 Statement of the Problem and Motion Equations of the Mechanical System -- 16.2 Application of the Pontryagin Maximum Principle. Relation to the Nonholonomic Problem -- 16.3 Application of the Generalized Gauss Principle for Solving the Above Generalized Chebyshev Problem -- 16.4 Statement and Solution of the Extended (Generalized) Boundary-value Problem -- 16.5 Calculation Results -- 16.6 Conclusions -- References -- Chapter 17 Theory of Cosserat-type Elastic Shells with Distributed Dislocations and Disclinations -- 17.1 Introduction -- 17.2 Initial Relations of the Geometrically Linear Theory of the Cosserat-type Shells -- 17.3 Continuously Distributed Dislocations and Disclinations in an Elastic Shell.
17.4 Boundary-value Problem of Equilibrium of a Shell with Distributed Dislocations and Disclinations -- 17.5 Variational Formulation of the Equilibrium Problem for an Elastic Shell with Distributed Dislocations and Disclinations -- 17.6 Static-geometry Analogy -- 17.7 Spherical Shell with Uniformly Distributed Dislocations and Disclinations -- 17.8 Conclusion -- References.
