

Федеральное агентство научных организаций  
Уральское отделение Российской академии наук  
Институт машиноведения УрО РАН  
Институт физики прочности и материаловедения СО РАН  
Институт математики и механики им. Н.Н. Красовского УрО РАН

## **ПРОГРАММА**

### **XI МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ «МЕХАНИКА, РЕСУРС И ДИАГНОСТИКА МАТЕРИАЛОВ И КОНСТРУКЦИЙ»**

(Екатеринбург, 11–15 декабря 2017 г.)

Екатеринбург  
ИМАШ УрО РАН  
2017

**СЕКЦИЯ 1. Механика поврежденности и разрушения**

**СЕКЦИЯ 2. Структурные аспекты деформации и разрушения**

**СЕКЦИЯ 3. Контроль и диагностика материалов и конструкций**

**СЕКЦИЯ 4. Материалы с многоуровневой иерархической структурой**

**СЕКЦИЯ 5. Моделирование материалов с многоуровневой иерархической структурой**

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**РАСПИСАНИЕ КОНФЕРЕНЦИИ**  
**(Время Московское)**

<b>11.12.2017,</b> <b>понедельник</b>	09.00 – 15.00 <b>Онлайн регистрация участников</b> ( <i>ИМАШ УрО РАН</i> )
	Проверка подключения. Шакиров Рауль Нурович, тел. +7 952 729 7936.
<b>12.12.2017,</b> <b>вторник</b>	09.00 – 09.05 <b>Открытие конференции</b>
	09.10 – 12.00 <b>Доклады</b> ( <i>Онлайн трансляция</i> ) <b>Стендовые доклады</b> ( <i>Сайт конференции</i> )
<b>13.12.2017,</b> <b>среда</b>	09.00 – 12.00 <b>Доклады</b> ( <i>Онлайн трансляция</i> )
	<b>Стендовые доклады</b> ( <i>Сайт конференции</i> )
<b>14.12.2017,</b> <b>четверг</b>	09.00 – 12.00 <b>Доклады</b> ( <i>Онлайн трансляция</i> )
	<b>Стендовые доклады</b> ( <i>Сайт конференции</i> )
<b>15.12.2017,</b> <b>пятница</b>	09.00 – 12.00 <b>Доклады</b> ( <i>Онлайн трансляция</i> )
	12.00 – 12.05 <b>Заккрытие конференции</b>
	<b>Стендовые доклады</b> ( <i>Сайт конференции</i> )

**ПРОГРАММА КОНФЕРЕНЦИИ**  
**(Время Московское)**

<b>ДОКЛАДЫ</b> Председатель: Горкунов Э.С.	
<b>Вторник, 12 декабря</b>	
09.05-09.35	<b>Gorkunov E. S.</b> Evaluating Structural and Phase Changes in Individual Layers of Multilayer Products with the use of Differential Magnetic Permeability (Екатеринбург)
09.45-10.00	<b>Saraev Yu. N., Gladkovsky S. V., Lepikhin S. V., Dvoynikov D. A., Kamantsev I. S. and Veselova V. E.</b> Influence of the Welding Method on the Impact Strength and Cyclic Fracture Toughness Parameters of the 09G2S Steel (Екатеринбург)
10.10-10.25	<b>Pugacheva N. B., Vichuzhanin D. I., Michurov N. S. and Smirnov A. S.</b> Effect of Hot Plastic Deformation on the Structural State of a Al-10%SiC Composite (Екатеринбург)
10.35-10.50	<b>Yakimenko I. V., Kanishchev O. A. Lyamets L. L. and Volkova I. V.</b> A Model of the Gas Analysis System Operation Process (Смоленск)
11.00-11.30	<b>Mironov V. A., Mironova T. F., Kuvatov V. A., Nokhrina O. Yu. and Kuvatova E. V.</b> High Resolution Heart Rate Variability Analysis in Patients with Angina Pectoris during Coronary Artery Bypass Graft Surgery (Екатеринбург)
11.40-11.55	<b>Ogorodnikov A. I. and Tikhonov I. N.</b> Computer-Aided Analysis of Cutting Processes for Brittle Materials (Екатеринбург)
<b>Среда, 13 декабря</b>	
09.05-09.35	<b>Kazakov A. L., Lempert A. A. and Kuznetsov P. A.</b> On the Analytic Solvability of a Special Boundary Value Problem for the Nonlinear Heat Equation (Иркутск)
09.45-10.15	<b>Bekher S. A. and Sych T. V.</b> Development of Methodology for the Calculation and Experimental Investigation of Acoustic Emission Signals (Новосибирск)
10.25-10.40	<b>Belozеров G. A., Smirnov A. S., Konovalov A. V., Muizemnek O. Yu. and Perminova A. V.</b> Effect of Strain Rate on the Formation of the Microstructure of a 1950/10% SiC Metal Matrix Composite under High Temperature (Екатеринбург)
10.50-11.05	<b>Gladkovsky S. V., Kamantsev I. S., Kuteneva S. V., Veselova V. E. and Ryzhkov M. A.</b> The Thermal Expansion and Thermophysical Properties of an Aluminum and Al/B <sub>4</sub> C composite (Екатеринбург)
11.15-11.30	<b>Makarov A.V., Soboleva N. N. and Malygina I. Yu.</b> Thermal Stability of a Laser-Clad NiCrBSi Coating Hardened by Frictional Finishing (Екатеринбург)
11.40-11.55	<b>Prosviryakov E. Yu. and Spevak L. F.</b> Exact Solutions for Layered Thermocapillary Convection of a Viscous Incompressible Fluid with Specified Stresses on the Bottom (Екатеринбург)
<b>Четверг, 14 декабря</b>	
09.00-09.35	<b>Korobov Yu. S., Nevezhin S. V., Filippov M. A., Makarov A. V., Malygina I. Yu., Fantozzi D., Milanti A., Koivuluoto H. and Vuoristo P.</b> Properties of Arc-Sprayed Coatings from Fe-based Cored Wires for High-Temperature Applications (Екатеринбург)
09.45-10.15	<b>Prosviryakov E. Yu.</b> Waves of Pressure in Viscous Incompressible Fluid (Екатеринбург)
10.25-10.40	<b>Karamyshev A. P., Nekrasov I. I., Nesterenko A. V., Parshin V. S., Smirnov S. V., Shveikin V. P. and Fedulov A. A.</b> Studying Damage Accumulation in Martensitic Corrosion-Resistant Steel under Cold Radial Reduction (Екатеринбург)
10.50-11.05	<b>Smirnov S. V., Konovalov A. V., Myasnikova M. V., Khalevitsky Yu. V., Smirnov A. S. and Igumnov A. S.</b> Modeling the Stress-Strain State of the V95/SiC Aluminum Alloy Matrix Composite under Uniaxial Loading (Екатеринбург)
11.15-11.30	<b>Makarov A. V., Samoylova G. V., Gavrilov N. V., Mamaev A. S., Osintseva A. L., Kurennykh T. E. and Savrai R. A.</b> Effect of Preliminary Nanostructuring Frictional Treatment on the Efficiency of Nitriding of Metastable Austenitic Steel in Electron Beam Plasma (Екатеринбург)
11.40-11.55	<b>Stepanova L. V.</b> Estimation of the Crack Propagation Direction Angle for Two Collinear Cracks of Different Lengths in an Infinite Isotropic Linear Elastic Plane (Самара)

<b>Пятница, 15 декабря</b>	
09.00-09.35	<b>Panin S. V., Kornienko L. A., Alexenko V. O., Buslovich D. G. and Dontsov Yu. V.</b> Extrudable Polymer-Polymer Composites Based on Ultra-High Molecular Weight Polyethylene (Томск)
09.45-10.00	<b>Danzanova E. V., Gerasimov A. I., Botvin G. V.</b> Extended Tensile Testing of Welded Joints of Polyethylene Pipes (Якутск)
10.05-10.20	<b>Petukhova E. S. and Gogoleva O. V.</b> Investigation of Polyethylene Nanocomposites for Pipes (Якутск)
10.25-10.40	<b>Struzhanov V.V. and Korkin A.V.</b> Destruction of Nanochains under Stressing (Екатеринбург)
10.50-11.05	<b>Pugacheva N. B., Bykova T. M., Michurov N. S., Senayeva E. I. and Cheremitsina E. R.</b> Effect of the Content of SiC on the Structure and Properties of D16 Alloy Matrix Composites (Екатеринбург)
11.15-11.55	<b>Smirnov S. V., Veretennikova I. A., Smirnova E. O. and Pestov A. V.</b> Effect of Fillers in Epoxy Coatings Based on the ED-20 Resin on the Mechanical Properties Determined by Instrumented Microindentation (Екатеринбург)

## СТЕНДОВЫЕ ДОКЛАДЫ

1.	<b>Agapitova O. Yu., Byvaltsev S. V. and Zalazinsky A. G.</b> Mathematical Modeling of Hydromechanical Extrusion
2.	<b>Baronin G. S., Buznik V. M., Dmitriev O. S., Zavrzhina C. V., Mishchenko S. V., Zavrzhin D. O. and Khudyakov V. V.</b> The Structure and Properties of Fluoroplastic Modified with Titanium Nanoparticles
3.	<b>Baronin G. S., Buznik V. M., Dmitriev O. S., Zavrzhina C. V., Mishchenko S. V., Zavrzhin D. O. and Khudyakov V. V.</b> Thermophysical Properties of Fluoropolymer Composites with Cobalt Nanoparticles
4.	<b>Burenina O. N. and Savvinova M. E.</b> Sources of Mineral Raw Materials for the Production of Building Materials of the Republic of Sakha (Yakutia)
5.	<b>Burmasheva N. V. and Prosviryakov E. Yu.</b> Exact Solution for the Layered Convection of a Viscous Incompressible Fluid at Specified Temperature Gradients and Tangential Forces on the Free Boundary
6.	<b>Burov A. E., Lepikhin A. M. and Moskvichev V. V.</b> Strength and Reliability Analysis of Metal-Composite Overwrapped Pressure Vessel
7.	<b>Doletskaya L. I., Solopov R. V., Kavchenkov V. P. and Andreenkov E. S.</b> Analyzing the Reliability of Mechanical Parts in 10 kV Aerial Transmission Lines under Ice-Coating and Wind Effects in View of Their Design Features
8.	<b>Doronin S.V.</b> Projections of Limiting States for Load-Bearing Structures of Reflectors Made of Polymer Composites
9.	<b>Doronin S. V., Reizmunt E. M. and Filippova Yu. F.</b> Design Evaluation of Safety Factors for Reflector Skeleton Made of Polymer Composites
10.	<b>Drukarenko N. A., Kamantsev I. S., Kuznetsov A. V., Vladimirov A. P. and Khudorozhkova Yu. V.</b> Numerical and Experimental Approaches to the Evaluation of the Fatigue Life of a Cylindrical Specimen made of the 09G2S Steel
11.	<b>Emelyanov I. G., Mironov V. I. and Kuznetsov A. V.</b> Evaluating the Effect of Damping Structures in the Design of a Locomotive Cab during a Collision
12.	<b>Eremina G. M. and Smolin A. Yu.</b> Numerical Study of the Influence of the Thickness and Roughness of TiN Coatings on Their Wear in Scratch Testing
13.	<b>Fedorov Yu. Yu., Popov S. N., Savvina A. V., Vasilyev S. V. and Rodionov A. K.</b> A Simplified Method to Determine Resistance to Rapid Crack Propagation in Polyethylene Pipes
14.	<b>Fedotov A. I., Kuznetsov N. Y., Lysenko A. V. and Vlasov V. G.</b> Car Suspension System Monitoring under Road Conditions
15.	<b>Filin S. A., Rogalin V. E. and Kaplunov I. A.</b> Improving Resource of Metal Mirrors for Powerful Lasers
16.	<b>Filin S. A., Rogalin V. E., Kaplunov I. A. and Zingerman K. M.</b> Physical-Chemical Purification of Power Metal Optics for Increasing Its Service Life
17.	<b>Gorkunov E. S., Povolotskaya A. M. and Zadvorkin S. M.</b> Differential Evaluation of the Magnetic State of Wire Packages
18.	<b>Gorkunov E. S., Yakushenko E. I., Zadvorkin S. M. and Mushnikov A. N.</b> Analytical Description of Changes in the Magnetic States of Chromium-Nickel Steel under Uniaxial Elastic Deformation
19.	<b>Gorshkov A. V. and Prosviryakov E. Yu.</b> Complex Large-Scale Convection of a Viscous Incompressible Fluid with Heat Exchange According to Newton's Law
20.	<b>Gorshkov A. V. and Prosviryakov E. Yu.</b> Convective Flow in the Solid Rotation of a Viscous Incompressible Fluid
21.	<b>Illarionov A. G., Stepanov S. I. and Demakov S. L.</b> Fracture Surface Analysis of a Quenched ( $\alpha+\beta$ )-Metastable Titanium Alloy
22.	<b>Kanyukov S. I., Kononov A. V. and Muizemnek O. Yu.</b> Intersubjective Decision-Making for Computer-Aided Forging Technology Design
23.	<b>Khalevitsky Yu. V., Kononov A. V., Burmasheva N. V. and Partin A. S.</b> Linear Solver Performance in Elastoplastic Problem Solution on GPU Cluster
24.	<b>Kislyakov M. A., Chernov V. A., Maksimkin V. L. and Bozhin Yu. M.</b> Features of Electromagnetic Processes in Electric Gas Turbine Installations
25.	<b>Kislyakov M. A., Chernov V. A., Maksimkin V. L. and Bozhin Yu. M.</b> Ideology of a Multiparametric System for Estimating the Insulation System of Electric Machines on the Basis of Absorption Testing Methods
26.	<b>Kondakov A. S.</b> Thermal Calculation in Branch Pipe Cavity of Fire Hydrant in Conditions of Far North
27.	<b>Koroleva L. F.</b> Abrasive Properties of Modified Oxides for Finish Polishing of Steel
28.	<b>Kryuchkov D. I. and Zalazinsky A. G.</b> A Hybrid Modeling System Designed to Support Decision Making in the Optimization of Extrusion of Inhomogeneous Materials

29.	<b>Kryuchkov D. I., Berezin I. M., Nesterenko A. V., Zalazinsky A. G. and Vichuzhanin D. I.</b> Studying the Compactibility of the VT22 High-Strength Alloy Powder Obtained by the PREP Method
30.	<b>A. V. Kuznetsov, I. S. Kamantsev, S. M. Zadvorkin, Drukarenko N. A., Goruleva L. S. and Veselova V. E.</b> Evaluating the Damage of Steel 09G2S under Static and Cyclic Loading with Regard for the Level of Residual Stresses in the Metal
31.	<b>Kuznetsov N. Yu., Fedotov A. I. and Vlasov V. G.</b> Test Benches for Studying the Properties of Car Tyres
32.	<b>Loginov Yu. N., Pervukhin A. E., Babailov N. A.</b> Evolution of Surface Defects in Platinum Alloy Wire under Drawing
33.	<b>Loginov Yu. N. and Puzanov M. P.</b> Finite Element Modeling of the Upsetting of an Anisotropic Cylindrical Workpiece
34.	<b>Loginov Yu. N., Babailov N. A. and Polyansky L. I.</b> The Properties of Coke Breeze Briquettes Produced by Ram Briquetting
35.	<b>Lozhkomoev A. S., Kazantsev S. O. and Glazkova E. A.</b> Synthesis and Adsorption Properties of Hollow Tubular Alumina Fibers
36.	<b>Lyamets L. L., Yakimenko I. V., Kanishchev O. A. and Bliznyuk O. A.</b> Small Sample Estimation of the Reliability Function for Technical Products
37.	<b>Maisuradze M. V. and Ryzhkov M. A.</b> The Dependency of Mechanical Properties on the Microstructure Anisotropy Index of Some Alloyed Steels
38.	<b>Malikov V. N., Dmitriev S. F., Katasonov A. O., Sagalakov A. M. and Ishkov A. V.</b> Subminiature Eddy-Current Transducers Designed to Study Welded Joints of Titanium Alloys
39.	<b>Mironov V. I., Lukashuk O. A. and Ogorelkov D. A.</b> Estimation of Metallic Structure Durability for a Known Law of Stress Variation
40.	<b>Mishchenko S. V., Zavrazhin D. O., Zavrazhina C. V. and Tugolukov E. N.</b> Numerical Simulation of the Temperature Field and Microwave Absorption by Carbon Nanotubes and Polymer Composites
41.	<b>Moskvichev E. V. and Khakhlenkova A. A.</b> Analyzing the Surface Accuracy of a Rigid Reflector under Mechanical and Thermal Loading
42.	<b>Nikolaeva L. A. and Burenina O. N.</b> Justification of Rational Parameters of Briquetting Using Mechanic Activation Techniques
43.	<b>Ovchinnikov N. P., Portnyagina V. V. and Sobakina M. P.</b> Dependence of the Mean Time to Failure of a Hydraulic Balancing Machine Unit on Different Factors for Sectional Pumps of the Alrosa JSC
44.	<b>Panin S. V., Vlasov I. V., Maruschak P. O., Moiseenko D. D., Berto F. and Vinogradov A.</b> Influence of Stress Concentrator Shape and Testing Temperature on Impact Bending Fracture of 17Mn1Si Pipe Steel
45.	<b>Aleksandr Pervikov, Nikolay Rodkevich, Elena Glazkova and Marat Lerner</b> Bimodal Metal Micro-Nanopowders for Powder Injection Molding
46.	<b>Petrova P. N., Gogoleva O. V. and Mayer A. F.</b> Influence of Ultrasound and Discrete Basalt Fibers on the Properties of Ultrahigh Molecular Weight Polyethylene
47.	<b>Prosviryakov E. Yu. and Spevak L. F.</b> Simulation of a Viscous Flow in Layered Composites in View of the Thermocapillary Effect
48.	<b>Pyshmintsev I. Yu., Bityukov S. M., Pastukhov V. I., Danilov S. V., Vedernikova L. O. and Lobanov M. L.</b> Evolution of Microstructure in Stainless Martensitic Steel for Seamless Tubing
49.	<b>Savrai R. A., Makarov A. V., Gorkunov E. S., Soboleva N. N., Kogan L. Kh., Malygina I. Yu., Osintseva A. L. and Davydova N. A.</b> Eddy-Current Testing of Fatigue Degradation upon Contact Fatigue Loading of Gas Powder Laser Clad NiCrBSi-Cr <sub>3</sub> C <sub>2</sub> Composite Coating
50.	<b>Savrai R. A. and Kuznetsov A. V.</b> Evaluation of Contact Stresses in the Surface of an Elastic-Plastic Plate Penetrated by a Flat-Ended Rigid Cylindrical Punch
51.	<b>Shalimov A. S. and Tashkinov M. A.</b> An X-FEM Model of Crack Propagation in the Matrix of Randomly Reinforced Heterogeneous Media
52.	<b>Shipacheva E. N., Petunin A. A. and Berezin I. M.</b> A Genetic Algorithm Used for Solving One Optimization Problem
53.	<b>Solovei V. D. and Kolmogorov V. L.</b> A Method for Calculating the Plastic Anisotropy Constants of the Hill Theory
54.	<b>Spevak L. F. and Kazakov A. L.</b> Solving a Degenerate Nonlinear Parabolic Equation with a Specified Source Function by the Boundary Element Method
55.	<b>Spevak L. F. and Nefedova O. A.</b> Solving a Two-Dimensional Nonlinear Heat Conduction Equation with Nonzero Boundary Conditions by the Boundary Element Method
56.	<b>Starostin N. P. and Vasilieva M. A.</b> Technological Parameters of Welding of Branch Saddles to Polyethylene Pipes at Low Temperatures
57.	<b>Starostin N. P. and Ammosova O. A.</b> Calculation of the Technological Parameters of Electrofusion Welding of Polyethylene Pipes at Low Temperatures
58.	<b>Stepanova L. V.</b> The Generalized Fracture Criteria Based On the Multi-parameter Representation of the

	Crack Tip Stress Field
59.	<b>Stepanova L. V.</b> Modeling of Crack Growth under Mixed-Mode Loading by a Molecular Dynamics Method and a Linear Fracture Mechanics Approach
60.	<b>Taratorkin I. A., Derzhansky V. B. and Taratorkin A. I.</b> Methods for Predicting Dynamic Loading of Friction Disks
61.	<b>Tikhonov R. S. and Starostin N. P.</b> Experimental Evaluation of the Efficiency of Thermal Diagnostics of Friction in a Sliding Bearing System with Regard for Shaft Rotation Speed
62.	<b>Volkov S. S., Struzhanov V. V.</b> Fatigue Durability under Random Cyclic Loading
63.	<b>Voronin S. V. and Chaplygin K. K.</b> Finite Element Analysis of the Upsetting of a 5056 Aluminum Alloy Sample with Consideration of Its Microstructure
64.	<b>Voronin S. V. and Loboda P. S.</b> Methods for Producing Foamed Aluminum
65.	<b>Yepin V. V., Tsvetkov R. V., Shardakov I. N. and Shestakov A. P.</b> Investigation of Natural Oscillations of a Viscous Liquid in an Elastic Tube
66.	<b>Zalazinskaya E. A. and Zalazinsky A. G.</b> A Model of High-Rate Indentation of a Cylindrical Striking Pin into a Deformable Body
67.	<b>Zalazinsky A. G., Kryuchkov D. I., Nesterenko A. V. and Titov V. G.</b> Choosing the Optimal Pareto Composition of the Charge Material for the Manufacture of Composite Blanks
68.	<b>Zamaraev L. M. and Smirnov S. V.</b> High-Temperature Short-Term Creep of the Grade 2 and Ti-5Al Titanium Alloys under Heating in Air and Helium
69.	<b>Zlobina I. V., Bekrenev N. V. and Muldasheva G. K.</b> Influence of the Microwave Electromagnetic Field on the Micro- and Nanostructure of Reinforcing Topological Structures Based on Carbon Fibers
70.	<b>Sidashov A. V. and Kolesnikov I. V.</b> Nonequilibrium Processes of Segregation and Diffusion in Metal-Polymer Tribosystems
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