

XV Zababakhin Scientific Talks

International Conference

at

Russian Federal Nuclear Center –

Zababakhin All-Russia Scientific Research Institute
of Technical Physics

CONFERENCE SESSIONS AND THEIR LOCATIONS

Designations:

I – Plenary session;  – online report;

1-1...1P – the first digit – section number, the second digit – session number, letter “P” – poster session

Talks in the program are numbered as in the book of abstracts.

SITE	September 27		September 28		September 29		September 30		October 1	
	9 ³⁰ –13 ⁰⁰	14 ³⁰ –18 ⁰⁰	9 ⁰⁰ –13 ⁰⁰	14 ³⁰ –18 ⁰⁰	9 ⁰⁰ –13 ⁰⁰	14 ³⁰ –18 ⁰⁰	9 ⁰⁰ –13 ⁰⁰	14 ³⁰ –18 ⁰⁰	9 ⁰⁰ –13 ⁰⁰	14 ³⁰ –18 ⁰⁰
DK Oktyabr	Opening ceremony I									
Hall 1 (room 313, 3 rd floor)		2-1	2-2	4-1	4-2	4-3	6-1	4-4	6-2	Closing
Hall 2 (room 321, 3 rd floor)		1-1	1-2	3-1	3-2	5-1	7-1	5-2	7-2	
Posters (Foyer)		1P (7)		3P (6)		5P (3)		7P (15)		
		2P (26)		4P (17)		6P (20)		6P (13)		
Coffee-break		16 ⁰⁰ –16 ³⁰	10 ⁴⁵ –11 ¹⁵	16 ⁰⁰ –16 ³⁰	10 ⁴⁵ –11 ¹⁵	16 ⁰⁰ –16 ³⁰	10 ⁴⁵ –11 ¹⁵	16 ⁰⁰ –16 ³⁰	10 ⁴⁵ –11 ¹⁵	

Section	Session	Day	Morning		Afternoon		
			9 ⁰⁰ –10 ⁴⁵	11 ¹⁵ –13 ⁰⁰	14 ³⁰ –16 ⁰⁰	16 ³⁰ –18 ⁰⁰	
CHAIRMEN OF SESSIONS							
Opening ceremony Plenary session		September 27	G. N. Rykovanov				
	1, P	September 27			V. N. Nogin, A. V. Fedorov	M. G. Anuchin, Yu. V. Yanilkin	
1	2, P	September 28	V. A. Simonenko, A. V. Zaitsev	A. K. Muzyrya, V. A. Ogorodnikov			
	1, P	September 27			A. P. Ershov, A. L. Zherebtsov		
2	2, P	September 28	K. A. Ten, E. B. Smimov				
	1, P	September 28			P. A. Loboda, A. P. Kuznetsov	A. V. Brantov, E. A. Govras	
3	2, P	September 29	S. I. Glazyrin, N. G. Karlykhanov	I. V. Glazyrin, V. M. Gubchenko			
	1, P	September 28			M. V. Zhemokletov, V. M. Elkin		
4	2, 3, P	September 29	V. V. Dremov, K. V. Khishchenko				
	4	September 30			I. V. Lomonosov, V. I. Tarzhanov	E. V. Shorokhov, E. F. Gryaznov	
5	1, P	September 29			D. V. Khmel'nitskiy, V. P. Sokolov		
	2, P	September 30			V. A. Simonenko, I. A. Kirillov		
6	P	September 29					
	1, P	September 30	A. A. Bragin, S. V. Senchukov				
7	2, P	October 1	V. V. Dremov, Ya. V. Pronin				
	1, P	September 30	S. N. Lebedev, G. D. Kaminskiy	O. V. Zatsepin, K. K. Avilov			
Closing	2, P	October 1	I. A. Litvinenko, A. A. Romanyukha	B. K. Vodolaga, V. P. Osipov			
		October 1	V. A. Simonenko				

CONFERENCE OPENING

SEPTEMBER 27, MONDAY

Hall of DK Oktyabr

Chairman: Georgy N. Rykovanov

9³⁰ **CONFERENCE OPENING**

GREETINGS BY:

Mikhail E. Zheleznov, Director General of RFNC – VNIITF

Georgy N. Rykovanov, Scientific Director of RFNC – VNIITF

9⁴⁰ **ANNOUNCEMENTS BY PROGRAM AND ORGANIZATIONAL COMMITTEES**

PLENARY SESSION

SEPTEMBER 27, MONDAY

Hall of DK Oktyabr

Chairman of the session: Georgy N. Rykovanov

- 10⁰⁰ **NUCLEAR POWER AS A BACKBONE OF ENERGY AND ENVIRONMENTAL SECURITY**
 Evgeny O. Adamov
 Innovation and Technology Center of “Proryv” Project, Moscow, Russia
- 10³⁰ **SUPERCOMPUTER TECHNOLOGIES: PROBLEMS AND PROSPECTS**
 Boris N. Chetverushkin
 Federal Research Center “M. V. Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences”, Moscow, Russia
- 11⁰⁰ **EXPERIMENTAL STUDIES IN THE INTEREST OF VIRTUAL TESTS**
 Dmitry V. Petrov
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 11³⁰ **VIRAL INFECTIONS OF XXI CENTURY: SIMULATION OF EPIDEMICS**
 Eduard V. Karamov^{1,2}
¹National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia
²The National Research Center for Epidemiology and Microbiology named after Honorary Academician N. F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia
- 12⁰⁰ **SOLID-DENSITY PLASMA CREATED BY DIRECT AND INDIRECT IMPACT OF SUB-PW PICOSECOND LASER PULSES**
 Sergey A. Pikuz^{1,2}, A. S. Martynenko¹, L. Antonelli³, C. D. Baird³, F. Barbato⁴, N. Booth⁵, G. Boutoux⁴, L. N. K. Döhl³, P. Durey³, D. Farley³, L. Giuffrida³, S. B. Hansen⁶, J. J. Honrubia⁷, E. Hume³, J. Jacoby⁸, D. Khaghani⁹, K. Lancaster³, P. McKenna¹⁰, C. D. Murphy³, P. Neumayer¹¹, O. Rosmej¹¹, S. N. Ryazantsev^{1,2}, J. J. Santos⁴, I. Yu. Skobelev^{1,2}, C. Spindloe⁵, O. Turianska⁴, D. Batani^{2,4}, N. Woolsey³
¹Joint Institute for High Temperatures RAS, Moscow, Russia
²National Research Nuclear University “MEPhI”, Moscow, Russia
³York Plasma Institute, Department of Physics, University of York, York YO10 5DD, UK
⁴University of Bordeaux, CNRS, CEA, CELIA, F-33405 Talence, France
⁵Central Laser Facility, STFC Rutherford Appleton Laboratory, Didcot OX11 0QX, UK
⁶Sandia National Laboratories, Albuquerque, NM 87123, USA
⁷ETSI Aeronauticos, Universidad Politecnica de Madrid, Madrid, Spain
⁸Goethe-Universität Frankfurt, D-60438 Frankfurt-am-Main, Germany
⁹SLAC National Accelerator Laboratory, Menlo Park, California 94025, USA
¹⁰Department of Physics, SUPA, University of Strathclyde, Glasgow G4 0NG, UK
¹¹GSI – Helmholtzzentrum für Schwerionenforschung GmbH, D-64291 Darmstadt, Germany
- 12³⁰ **TAKING GROUP PHOTO**
- 13⁰⁰ *Lunch*

SECTION 1

Section 1 **SPACE PROTECTION OF THE EARTH, HIGH-INTENSITY PROCESSES AND TURBULENCE**


SEPTEMBER 27, MONDAY


Afternoon session

Hall 2

Co-chairs: Vladimir N. Nogin,
Alexey V. Fedorov

Presentations

- 1-17 14³⁰ **DETECTION OF EJECTA CLOUD BY SYNCHROTRON RADIATION,
PDV AND PIEZO-ELECTRIC SENSORS**
Konstantin A. Ten¹, E. R. Prueel¹, A. O. Kashkarov¹, I. A. Rubtsov¹, D. V. Petrov²,
A. Yu. Garmashev², E. B. Smirnov², D. P. Kuchko², V. V. Malev², D. V. Mukhin²,
A. E. Shirobokov², S. A. Fefilov², A. Yu. Fedorov², L. I. Shekhtman³, V. V. Zhulanov³,
B. P. Tolochko⁴
¹Lavrentyev Institute of Hydrodynamics, SB RAS, Novosibirsk, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
³Budker Institute of Nuclear Physics, SB RAS, Novosibirsk, Russia
⁴Institute of Solid State Chemistry and Mechanochemistry, SB RAS, Novosibirsk, Russia
- 1-4 14⁵⁰ **ON EJECTION OF PARTICLES FROM THE FREE SURFACE
OF COPPER LINERS UNDER SHOCKWAVE, QUASI-ENTHROPIC
AND ISENTHROPIC REGIMES OF THEIR ACCELERATION**
 Ilya A. Blinov, V. A. Ogorodnikov, S. V. Yerunov, A. O. Blikov, E. V. Kulakov,
E. A. Chudakov, M. V. Antipov, K. N. Panov, M. A. Syrunin, V. N. Knyazev,
N. B. Davydov, A. B. Georgievskaya, A. O. Yagovkin, I. V. Yurtov, D. N. Zamyslov,
A. V. Kotin
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 1-25 15¹⁰ **REGISTRATION OF THE PARAMETERS OF A SHOCK-INDUCED EJECTA
WITH THE SIMULTANEOUS USE OF THE METHODS OF A HETERODYN
INTERFEROMETER AND A BROADBAND LASER RANGE**
Evgeny A. Chudakov, S. A. Finyushin, A. V. Fedorov, D. A. Kalashnikov, I. S. Gnutov,
I. V. Shmelev, E. A. Razumkov
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 1-8 15³⁰ **APPLICATION OF SIMULTANEOUS MEASUREMENTS BY PHOTON DOPPLER
VELOCIMETRY AND THE COHERENT BACKSCATTERING
FOR PROBING EJECTA FROM SHOCK-LOADED SAMPLES**
Arseny N. Kondrat'ev, A. V. Andriyash, Sh. M. Ismailov, V. G. Kamenev,
G. V. Kaplyukov, P. V. Kubasov, S. E. Kuratov, D. B. Rogozkin, A. A. Tihov, I. V. Tur,
A. S. Shubin, S. A. Shubin, P. N. Yaroshchuk
FSUE Dukhov Automatics Research Institute of (VNIIA), Moscow, Russia

- 1-22 15⁵⁰ **APPLICATION OF LASER INTERFEROMETRIC METHODS FOR STUDYING OF EJECTION PARAMETERS OF SHOCK LOADED METALS**
 Alexey V. Fedorov, S. A. Finyushin, E. A. Chudakov, D. A. Kalashnikov, I. S. Gnutov, A. O. Yagovkin
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 16¹⁰ *Coffee-break*
- 1-21 16⁴⁰ **EXPERIMENTAL CONFIRMATION OF POSSIBILITY FOR RECORDING DISTRIBUTION OF SHOCK-INDUCED FLOWS OF MICROPARTICLES IN SIZES AND VELOCITIES BY THE PULSE HOLOGRAPHY METHOD**
 Alexander V. Fedoseev, M. V. Antipov, A. N. Poduvalov, V. A. Ogorodnikov, A. V. Blinov, A. A. Utenkov, O. B. Sogrina
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- Co-chairs: Mikhail G. Anuchin,
 Yuri V. Yanilkin
- 1-18 17⁰⁰ **THE (k - ϵ)-MODEL MODIFICATIONS FOR TWO-DIMENSIONAL SHOCK-WAVE FLOWS**
 Yuliya V. Tretyachenko, A. R. Gughova, V. P. Statsenko, Yu. V. Yanilkin
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 1-26 17²⁰ **DIRECT NUMERICAL SIMULATION OF A TURBULENT MIXING ACCOUNTING THE HISTORY OF THE PROCESS**
 Yuri V. Yanilkin, A. R. Guzhova, L. I. Dyagterenko, V. Yu. Kolobyanin, V. A. Shmelyov
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 1-26 17⁴⁰ **STRUCTURE AND SPATIAL CORRELATIONS OF COLUMN COHERENT VORTEX IN A THREE-DIMENSIONAL ROTATING TURBULENT FLOW**
 Leon L. Ogorodnikov¹, S. S. Vergeles^{1,2}
¹National Research University Higher School of Economics, Physics Department, Moscow, Russia
²Landau Institute for Theoretical Physics RAS, Chernogolovka, Russia

SECTION 1

Section 1 **SPACE PROTECTION OF THE EARTH, HIGH-INTENSITY PROCESSES AND TURBULENCE**

SEPTEMBER 28, TUESDAY

Morning session

Hall 2

Co-chairs: Vadim A. Simonenko,
Anatoly V. Zaitsev

Presentations

- 1-9 9⁰⁰ **A MODEL OF THE BIG BANG AND THE EXPANSION OF THE UNIVERSE
IN GENERAL RELATIVITY WITH A SPREAD OF THE FINITE MASS OF GAS
FROM A POINT TO A VOID**

Alexander N. Kraiko

Central Institute of Aviation Motors Named after P. I. Baranov, Moscow, Russia

- 1-1 9²⁰ **ON THE CAUSES OF CHANGES IN THE MAGNETIC FIELD AND CLIMATE
OF THE EARTH**



Vladimir F. Anisichkin

Lavrentyev Institute of Hydrodynamics, Siberian Branch of the Russian Academy of Sciences,
Novosibirsk, Russia

- 1-5 9⁴⁰ **MATERIALS SCIENCE QUESTIONS OF ASTEROID SAFETY**



Viktor I. Grokhovsky

Institute of Physics and Technology, Ural Federal University, Ekaterinburg, Russia

- 1-3 10⁰⁰ **INTERACTIONS OF GALACTIC COMETS WITH ASTEROID BELT BODIES.
ORIGIN OF LONG-PERIODIC AND SHORT-PERIODIC COMETS**



Azary A. Barenbaum

Oil and Gas Research Institute RAS (OGRI RAS), Moscow, Russia

- 10²⁰ **UNPREDICTABLE AND INEVITABLE SPACE HAZARDS TO THE EARTH.
COUNTERING TECHNOLOGIES TO BE DEVELOPED FOR SURVIVAL
OF HUMAN CIVILIZATION**

Vadim A. Simonenko¹, D. V. Petrov¹, V. N. Nogin¹, A. V. Zaitsev²

¹Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia



²Non-profit organization “Center for the Earth planetary protection”, Khimki, Russia

10⁴⁵ *Coffee-break*

Co-chairs: Alexander K. Muzyrya,
Vladimir A. Ogorodnikov

- 1-20 11¹⁵ **CRITICAL BEHAVIOR OF DYNAMIC SYSTEMS AT HIGH-INTENSE ACTION**
Alexander Ya. Uchaev, E. V. Kosheleva, N. I. Sel'chenkova

Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia

- 1-11 11³⁵ **ANALYTICAL AND EXPERIMENTAL RESEARCH OF PULSED EXPLOSIVE LOADING PROCESSES OF DESTRUCTIVE ELEMENTS OF PROTECTIVE SWITCHES (PSS)**
 Maxim V. Manzuk¹, D. I. Alekseev¹, S. I. Krivosheev², S. G. Magazinov², V. V. Harchenko¹, V. O. Yurchenko¹
¹Joint Stock Company “D. V. Efremov Institute of Electrophysical Apparatus”, St. Petersburg, Russia
²Peter the Great Saint-Petersburg Polytechnic University (SPbPU), St. Petersburg, Russia
- 1-23 11⁵⁵ **CONVERGENCE OF METAL CYLINDRICAL SHELLS UNDER EXPLOSION**
 Alexey E. Kheyfets¹, V. I. Zeldovich¹, N. Yu. Frolova¹, A. A. Degtyarev², E. V. Shorokhov², E. B. Smirnov², S. M. Dolgikh²
¹M. N. Mikheev Institute of Metal Physics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 1-10 12¹⁵ **TESTING OF CALCULATION AND EXPERIMENTAL METHOD OF JET FORMATION RESEARCH UNDER SHOCK-WAVE IMPACT ON CONSTRUCTIVE INHOMOGENEITIES**
Dmitry P. Kuchko, V. N. Nogin, M. M. Shatov, A. G. Poptsov, D. G. Pankratov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 1-16 12³⁵ **USE OF TWO-DIMENSIONAL AUTOMODELED GAS FLOWS**
Evgeny I. Pon’kin^{1,2} and S. P. Bautin¹
¹Snezhinsk Institute of Physics and Technology, National Research Nuclear University «MEPhI», Snezhinsk, Russia
²Federal State Unitary Enterprise “Mayak Production Association” State Enterprise “Rosatom”, Ozyorsk, Russia
- 1-6 12⁴⁵ **PULSE X-RAY DEVICE BASED ON TESLA TRANSFORMER WITH INHOMOGENEOUS FORMING LINE IN THE DISCHARGE CIRCUIT**
Andrey V. Dolgikh^{1,2}, E. I. Palchikov^{1,2}, V. V. Klypin^{1,3}, M. S. Samoylenko¹, A. M. Ryabchun^{1,2}
¹Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia
²Novosibirsk State University, Novosibirsk, Russia
³Specialized Educational Scientific Center of Novosibirsk State University, Novosibirsk, Russia
- 13⁰⁰ *Lunch*

SECTION 1

Section 1P SPACE PROTECTION OF THE EARTH, HIGH-INTENSITY PROCESSES AND TURBULENCE

SEPTEMBER 27, MONDAY 14³⁰ TO 18⁰⁰

SEPTEMBER 28, TUESDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

1-14 **INFLUENCE OF METAL SURFACE ROUGHNESS ON THE MASS OF EJECTED DUST DURING SHOCK-WAVE EJECTION**

Kirill V. Novosyolov¹, K. A. Ten¹, E. R. Prueel¹, E. B. Smirnov²

¹Lavrentyev Institute of Hydrodynamics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia

²Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

1-19 **INVESTIGATION OF THE PARAMETERS OF THE POWDER FLOW OF TUNGSTEN PARTICLES EJECTED BY A SHOCK WAVE**



Alexander S. Tumanik¹, K. A. Ten¹, E. R. Prueel¹, E. B. Smirnov², D. P. Kuchko², A. E. Shirobokov²

¹Federal State Institution of Science M. A. Lavrentiev Institute of Hydrodynamics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia

²Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

1-2 **EXPERIMENTAL STUDY OF DAMPING EXPLOSIVE LOAD USING DIAPHRAGM RINGS**

Sergey V. Balushkin, A. Yu. Simonov, G. V. Kulikov, V. I. Belyakov, M. V. Nikiforov, S. D. Pasyukov, V. P. Kachaev, A. A. Tarakanov, V. N. Shcherbakov, A. S. Stepanov, I. N. Gordeev, A. K. Muzyrya, S. M. Ulyanov

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

1-13 **EXPERIMENTAL EVALUATION OF CRITICAL VELOCITY OF SCJ PENETRATION FROM CAST-IRON INTO CAST-IRON BARRIER**

Alexey G. Neskin, A. N. Zelenov

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

1-7 **FINDINGS ON DIAGNOSING THE SIZE OF FOCAL SPOT OF LINEAR-INDUCTION ACCELERATOR**

Peter A. Kolesnikov¹, V. Yu. Politov¹, S. A. Kolesnikov¹, A. R. Akhmetov¹, A. V. Kaplunov¹, V. Yu. Evert¹, O. A. Chernitsa¹, O. A. Nikitin¹, Yu. A. Trunev², D. I. Skovorodin²,

M. G. Atlukhanov², A. V. Burdakov², V. V. Danilov², V. V. Kurkuchekov², S. S. Popov²,

K. I. Zhivankov²

¹Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

²Budker Institute of Nuclear Physics SB RAS, Novosibirsk, Russia

1-24 **PLANS ON UPGRADING THE LINEAR-INDUCTION ACCELERATOR
WITH THE ELECTRON BOUNDARY ENERGY OF UP TO 2 MeV**

Artyom O. Chernitsa¹, I. A. Karachinsky¹, P. A. Kolesnikov¹, O. A. Nikitin¹, D. A. Starostenko²,
D. A. Nikiforov², Ya. V. Kulenko², P. A. Bak², O. A. Pavlov²

¹Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

²Budker Institute of Nuclear Physics Siberian Branch of RAS, Novosibirsk, Russia

1-12 **HIGH-VELOCITY MOTION OF THIN PLATES**

Alexander K. Muzyrya

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

SECTION 2

Section 2 EXPLOSION AND DETONATION PHENOMENA




SEPTEMBER 27, MONDAY

Afternoon session

Hall 1

Co-chairs: Alexander P. Ershov,
Alexey L. Zherebtsov

Presentations

- 2-44 14³⁰ **CHEMICAL SPIKE DEGENERATION AT DETONATION SUPRACOMPRESSSION IN TATB AND TATB-BASED EXPLOSIVES**
Vladislav I. Tarzhanov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-4 15⁰⁰ **COMPREHENSIVE STUDY OF EXPLOSIVE CHARACTERISTICS OF MODEL THERMOPLASTIC COMPOSITIONS BASED ON 1,1-DIAMINO-2,2-DINITROETHYLENE**
Azat I. Akhmetzyanov, V. A. Virchenko, V. G. Kulikov, A. A. Kazak
FSUE “SKTB “Technolog”, St. Petersburg, Russia
- 2-13 15²⁰ **ON ELECTROMAGNETIC MEASUREMENTS OF PARTICLE VELOCITY**
Alexander P. Ershov
Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia
- 2-47 15⁴⁰ **THE THEORETICAL AND COMPUTATIONAL ANALYSIS OF THE PROPAGATION OF DETONATION IN CYLINDRICAL SAMPLES OF EXPLOSIVE BASED ON TATB**
 Mariya O. Shirshova¹, V. B. Titova¹, N. A. Volodina¹, I. A. Spirin¹, E. R. Prueel², K. A. Tan², A. O. Kashkarov²
¹Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
²Lavrentyev Institute of Hydrodynamics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia
- 16⁰⁰ *Coffee-break*
- 2-14 16³⁰ **MODELLING OF COMPOSITES PENTAERYTHRITOL TETRANITRATE – ALUMINUM NANOPARTICLES WITH OXIDE SHELL LASER INITIATION**
 Alexander A. Zvekov, A. V. Kalenskii, E. V. Galkina, A. S. Zverev, M. V. Anan'eva
Kemerovo State University, Kemerovo, Russia
- 2-23 16⁵⁰ **MATHEMATICAL MODELLING ON UNSTATIONARY COMBUSTION OF GUNPOWDER IN CLOSED EXPLOSIVE BOMB WITH CONSTANT VOLUME**
 Alexey Yu. Krainov, V. A. Poryazov
National Research Tomsk State University, Tomsk, Russia
- 2-7 17¹⁰ **DEFLAGRATION AND DETONATION SIMULATION IN HYDROGEN-AIR MIXTURES**
Pavel E. Belyaev^{1,2}, I. R. Makeeva^{1,2}, D. A. Mastjuk¹, E. E. Pigasov^{1,2}
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²South Ural State University (NRU), Chelyabinsk, Russia

2-33 17³⁰ **ANALYZING THE CHEMICAL CHAIN REACTIONS OF DECOMPOSITION
AND EXPLOSIVE TRANSFORMATION FOR ULTRA-PURE SAMPLES
OF PETN, BENZOTRIFUROZANE, TRIAMINOTRINITROBENZENE,
DIAMINODINITRIETHYLENE, AND 2,4,6-TRINITROTOLUENE**

Alexander V. Stankevich, A. Kh. Rudina, N. P. Taibinov, O. V. Kostitsyn,
A. Yu. Garmashev

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

SECTION 2

Section 2 EXPLOSION AND DETONATION PHENOMENA





SEPTEMBER 28, TUESDAY



Morning session

Hall 1

Co-chairs: Konstantin A. Ten,
Evgeny B. Smirnov

Presentations

- 2-16 9⁰⁰ **EFFECT OF ZINC OXIDE, AND MATERIALS BASED ON IT, ON SENSITIVITY OF PENTAERYTHRITOL TETRANITRATE TO LASER RADIATION**
 Anton S. Zverev¹, D. R. Nurmukhametov¹, A. Yu. Mitrofanov², N. N. Ilyakova²
¹Federal Research Center of Coal and Coal Chemistry SB RAS, Kemerovo, Russia
²Kemerovo State University, Kemerovo, Russia
- 2-15 9²⁰ **THE INFLUENCE OF RESIDUAL POROSITY ON THE PHOTOACOUSTIC RESPONSE OF THE COMPOSITES TRANSPARENT MATRIX – METAL NANOPARTICLES**
 Alexander A. Zvekoy, A. V. Kalenskii, E. V. Galkina, A. S. Zverev, M. V. Anan'eva
Kemerovo State University, Kemerovo, Russia
- 2-25 9⁴⁰ **MODEL OF THE EXPLOSIVE DECOMPOSITION OF THE LOW-ABSORBING RADIATION EXPLOSIVES WITH THE INCLUSIONS OF ULTRADISPERSED PARTICLES OF METALS UNDER THE IMPACT OF NANOSECOND LASER PULSES**
 Denis R. Nurmukhametov, B. P. Aduev
Federal Research Center of Coal and Coal Chemistry SB RAS, Kemerovo, Russia
- 2-18 10⁰⁰ **REGISTRATION OF THE SHOCK TO DETONATION TRANSITION BY THE DYNAMICS OF RAREFACTION FLOW BEHIND THE WAVE FRONT BY THE METHOD OF SYNCHROTRON DIAGNOSTICS OF FAST PROCESSES**
 Alexey O. Kashkarov¹, K. A. Ten¹, E. R. Pruel¹, I. A. Rubtsov¹, A. A. Studennikov^{1,3}, K. M. Prosvirnin², A. Yu. Garmashev², E. B. Smirnov², A. K. Muzyrya², A. V. Sarafannikov²
¹Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
³Novosibirsk State Technical University, Novosibirsk, Russia
- 2-46 10²⁰ **INFLUENCE OF THE TNT CHARGE STRUCTURE ON THE DYNAMICS OF CHEMICAL REACTIONS DURING DETONATION**
Arkady S. Khorunzhenko¹, N. P. Satonkina²
¹Novosibirsk State University, Novosibirsk, Russia
²Lavrentyev Institute of Hydrodynamics, SB RAS, Novosibirsk, Russia
- 10⁴⁵ *Coffee-break*

- 2-32 11¹⁵ **THERMAL STRAIN TENSORS OF ULTRA-PURE MOLECULAR CRYSTALS OF HIGH-ENERGY COMPOUNDS**
Alexander V. Stankevich, E. B. Smirnov, N. P. Taibinov, O. V. Kostitsyn,
A. Yu. Garmashev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-45 11³⁵ **CHANGE OF THE RATE CONSTANT OF THERMAL DECOMPOSITION OF TATB AFTER IRRADIATION WITH RELATIVISTIC ELECTRONS**
 Boris P. Tolochko^{1,2}, M. A. Mikhailenko¹, K. B. Gerasimov¹, A. A. Bryazgin²,
A. Yu. Garmashev³, E. B. Smirnov³, A. V. Stankevich³, I. V. Chemagina³
¹Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia
²I. Ya. Postovsky Institute of Nuclear Physics, G. I. Budker SB RAS, Novosibirsk, Russia
³Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-26 11⁵⁵ **TWO-STAGE CARBON CONDENSATION MODEL**
 Ivan A. Rubtsov
Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia
- 2-31 12¹⁵ **THE INFLUENCE OF DYNAMIC RIGIDITY OF SHELL ON LOW-SENSITIVE HE DETONATION**
Maxim A. Sokolov, S. M. Dolgikh, E. B. Smirnov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-17 12³⁵ **PETN- AND BTF-BASED PLASTIC EXPLOSIVE COMPOSITIONS DEVELOPED TO PRODUCE THIN-LAYER CHARGES CAPABLE OF MINIMUM CRITICAL THICKNESS DETONATION**
Mikhail A. Vorobyov, S. I. Karachinsky, N. G. Bagavetdinov, A. K. Muzyrya,
S. V. Mytarev, E. A. Poteryaeva, I. R. Shakirov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 13⁰⁰ *Lunch*

Section 2P


EXPLOSION AND DETONATION PHENOMENA

SEPTEMBER 27, MONDAY 14³⁰ TO 18⁰⁰

SEPTEMBER 28, TUESDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

- 2-38 **MOLECULAR-KINETIC PROPERTIES OF ULTRA-PURE ENERGY-RICH COMPOUNDS AND THERMODYNAMIC CHARACTERISTICS OF SUBLIMATION PROCESSES**
Alexander V. Stankevich
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-2 **ELECTRICAL INSULATING COATINGS BASED ON COPOLYMER OF ISODECYL METHACRYLATE AND BENZYL METHACRYLATE WITH W WITH MAXIMUM DENSITY**
 Ilya M. Antonov¹, B. P. Tolochko^{1,2}, A. V. Varand^{1,2}, M. A. Mikhailenko^{1,2}, I. V. Eltsov³, A. A. Bryazgin², E. B. Smirnov⁴
¹Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia
²Budker Institute of Nuclear Physics SB RAS, Novosibirsk, Russia
³Novosibirsk State University, Novosibirsk, Russia
⁴Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-11 **THERMOPLASTIC EXPLOSIVE COMPOSITIONS EXPLOSION RESISTANCE AT THE IMPACT OF CUMULATIVE CHARGE JET**
Igor G. Galiullin, E. B. Smirnov, A. V. Sarafannikov, K. M. Prosvirnin, K. V. Eganov, D. M. Gagarkin, D. P. Dudnik, P. A. Peregudov, A. S. Gremitiskih, A. V. Vanchinov, S. V. Shakhmaev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-3 **CRYSTAL PARTICLE SIZE AND POROSITY IMPACT ON GAS-DYNAMIC PERFORMANCE OF TATB**
Ilya A. Akhlyustin, I. E. Kosolapov, K. M. Prosvirnin, K. M. Miroshkin, K. V. Eganov, Yu. A. Belenovskiy, E. B. Smirnov, A. Yu. Garmashev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-5 **COMPOSITION OF PRODUCTS OF SLOW COMBUSTION AND EXPLOSIVE TRANSFORMATION REACTIONS IN NANOTHERMITE COMPOSITES CuO/Al, Ni/Al BASED ON X-RAY PHASE ANALYSIS DATA**
Arsen P. Bakirov¹, A. V. Stankevich^{1,2}, L. Kh. Badretdinova², R. N. Valiev¹, N. P. Taibinov¹, V. Ya. Bazotov²
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Kazan National Research Technological University, Kazan, Russia

- 2-6 **INVESTIGATING THE THERMAL STABILITY AND SHOCK SENSITIVITY OF PLASTISOL HIGH-EXPLOSIVE COMPOSITIONS**
Irina A. Batalova, T. V. Antipova, I. A. Akhlyustin, Yu. A. Belenovsky, A. Yu. Garmashev, K. E. Kosolapov, K. M. Miroshkin, K. M. Prosvirnin, I. V. Chemagina
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-8 **STUDY OF THE THERMAL EXPLOSION DELAY IN MIXTURES OF NANOTHERMITE COMPOSITES CuO/Al AND Al/Ni, AND ASSESSMENT OF THE HISTORY OF CHEMICAL REACTIONS IN A SOLID-PHASE COMBUSTION WAVE**
Ramil N. Valiev¹, A. V. Stankevich^{1,2}, L. Kh. Badretdinova², A. R. Bakirov¹, N. P. Taibinov¹, V. Ya. Bazotov²
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Kazan National Research Technological University, Kazan, Russia
- 2-9 **TESTING OF EXPLOSIVE BOLTS AND SIMULATION OF THEIR SEPARATION UNDER EXPLOSIVE LOADING**
Dmitry M. Gagarkin, I. G. Galiullin, A. Yu. Garmashev, D. P. Dudnik, V. N. Dunaev, A. V. Sarafannikov, E. B. Smirnov, S. V. Shakhmaev, A. P. Beketov, E. Yu. Emel'yanova
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-36 **IN-DEPTH ANALYSIS OF REACTION PRODUCT AND MECHANISM OF CHAIN DECOMPOSITION REACTIONS FOR DIAMINOTETRAZINETRIAZOLE SUBJECTED TO THERMAL ACTION UP TO 2000 K/s**
Alexander V. Stankevich¹, G. L. Rusinov², S. G. Tolshchina², I. V. Chemagina¹, N. P. Taibinov¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²I. Ya. Postovsky Institute of Organic Synthesis Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
- 2-21 **NOZZLELESS AND FRAMELESS SOLID PROPELLANT ROCKET ENGINE**
Alla V. Konyukova¹, V. G. Shevchenko¹, D. A. Eselevich¹, A. I. Ananiev², Yu. P. Borshchev²
¹Institute of Solid State Chemistry UB RAS, Ekaterinburg, Russia
²JSC «Scientific and Production Association named after S.A. Lavochkin», Khimki, Russia
- 2-22 **FEATURES OF TETRYL DECOMPOSITION IN SOLUTION AND UNDER CONDITIONS OF DYNAMIC HEATING**
Dmitry A. Kosterov, P. N. Stolyarov, D. G. Permenov
SSC RF Federal State Unitary Enterprise «Central Research Institute of Chemistry and Mechanics named after D. I. Mendeleev», Moscow, Russia
- 2-27 **ANALYZING THE COMPOSITION OF ULTRA-PURE RDX, HMX, AND 2,4-DINITROANISOLE SAMPLES AS PRODUCTS OF CHEMICAL REACTIONS OF DECOMPOSITION AND EXPLOSIVE TRANSFORMATION**
Anisa Kh. Rudina, A. V. Stankevich, N. P. Taibinov, O. V. Kostitsyn, A. Yu. Garmashev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

2-30 DETAILED KINETICS OF SOLID HIGH EXPLOSIVES



Natalya P. Satonkina¹, V. Yu. Dolmatov², A. O. Kashkarov¹, G. K. Obratsov³,
N. A. Khlebanovsky³

¹Lavrentev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia

²Special Design and Technology Bureau "Tekhnolog", St. Petersburg, Russia

³Novosibirsk State University, Novosibirsk, Russia

**2-10 FINE CRYSTAL STRUCTURE AND COMBUSTION RATE
OF BTF THIN FILMS ON VARIOUS SUBSTRATES**

Dmitry M. Gagarkin, A. V. Stankevich, A. V. Sobolevskaya, A. N. Gretsova, O. A. Frolova,
V. N. Shcherbakov

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

2-40 SOLID STATE TETRILE DECOMPOSITION

Pavel N. Stolyarov, D. G. Permenov, D. A. Kosterov

State Scientific Center of the Russian Federation Federal State Unitary Enterprise "Central Research Institute
of Chemistry and Mechanics", Moscow, Russia

**2-34 IN-DEPTH ANALYSIS OF REACTION PRODUCT COMPOSITION AND CHEMICAL
REACTION KINETICS FOR COBALT (III) WITH BORON AND SILICON**

Alexander V. Stankevich, A. Kh. Rudina, B. G. Loboiko, N. P. Taibinov, A. Yu. Garmashev

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

DECOMPOSITION PROPERTIES IN THE MELT TETRYL

Pavel N. Stolyarov, D. G. Permenov, D. A. Kosterov

State Scientific Center of the Russian Federation Federal State Unitary Enterprise "Central Research Institute
of Chemistry and Mechanics", Moscow, Russia

**2-42 THE PROJECT OF 1-3 "FAST PROCESSES" BEAMLIN
AT THE SYNCHROTRON RADIATION FACILITY "SKIF"**

Alexey A. Studennikov^{1,2}, I. A. Rubtsov^{1,2}, E. R. Prueel², K. A. Ten², A. O. Kashkarov²,
V. P. Khalemenchuk², A. S. Arakcheev³, K. V. Zolotarev^{1,3}, K. E. Kuper^{1,3}, N. A. Mezentsev^{1,3},
A. D. Nikolenko³, Ya. V. Rakshun³, B. P. Tolochko⁴, L. I. Shekhtman³, V. A. Shkaruba^{1,3},
Ya. V. Zubavichus¹, A. Yu. Konovalova¹, S. V. Rashenko¹, Yu. V. Khomiakov³

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²Lavrentyev Institute of Hydrodynamics SB RAS, Novosibirsk, Russia

³Budker Institute of Nuclear Physics SB RAS, Novosibirsk, Russia

⁴Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia

**2-41 TECHNIQUE FOR COMPONENT ANALYSIS
OF PETN-BASED PHOTSENSITIVE HES WITH ADDITIVES
OF NANODISPERSIVE ALUMINUM AND IRON-DOPED CARBON NANOTUBES**

Marina S. Streltsova, A. V. Sobolevskaya, A. R. Bakirov, A. V. Stankevich, N. P. Taibinov,
A. Yu. Garmashev

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

**2-43 INVESTIGATING THE THERMAL STABILITY OF 2,4-DINITROANISOLE
AS PREPARED AND AFTER TWO-YEAR STORAGE**

Alexander Yu. Tarasov, A. V. Sarafannikov, N. P. Taibinov, K. A. Gaisina, I. V. Chemagina

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

- 2-35 **X-RAY PHASE ANALYSIS OF MULTICOMPONENT AMORPHOUS-NANOCRYSTALLINE COMPOSITES BASED ON MOLECULAR CRYSTALS**
Alexander V. Stankevich, A. R. Bakirov, N. P. Taibinov, O. V. Kostitsyn, A. Yu. Garmashev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-28 **ANALYSIS OF THE COMPOSITION OF PRODUCTS AND KINETICS OF CHEMICAL REACTIONS OF INTERACTION OF POLYTETRAFLUORETHYLENE WITH BORON AND SILICON**
Anisa Kh. Rudina, A. V. Stankevich, B. G. Loboiko, N. P. Taibinov, O. V. Kostitsyn, A. Yu. Garmashev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-39 **STRUCTURAL TRANSFORMATIONS OF ALUMINUM INTERMETALLIDES UNDER THEIR MECHANICAL ACTIVATION IN BALL VIBRATION MILLS**
Alexander V. Stankevich¹, M. A. Uymin², A. E. Ermakov², S. I. Novikov², D. I. Davydov², V. S. Gaviko²
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²M. N. Makheev Institute of Metal Physics UB RAS, Ekaterinburg, Russia
- 2-29 **CHROMATO-MASS-SPECTROMETRY AND MASS-SPECTROMETRY OF 2,4-DINITROANISOLE**
Anisa Kh. Rudina¹, A. V. Stankevich¹, V. I. Philyakova², G. L. Rusinov², N. P. Taibinov¹, O. V. Kostitsyn¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Institute of Organic Synthesis named after I. Ya. Postovskiy, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
- 2-19 **STUDY OF THE CONVERGENCE OF CYLINDRICAL SHELLS UNDER THE ACTION OF EXPLOSION PRODUCTS OF AN ALUMINIZED EXPLOSIVE**
Alexander Ye. Kiskin, K. V. Gaan, S. M. Dolgikh, K. V. Levak
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 2-20 **DETONATION CHARACTERISTICS OF ONY SALTS OF AZOTETRAZOLE**
Vasily I. Kolesov, K. O. Kapranov, D. A. Kosterov, A. I. Levshenkov
Mendeleev University of Chemical Technology of Russia, Moscow, Russia
- 2-24 **IGNITION OF PRIMARY EXPLOSIVES AND INITIATING MIXTURES EXPOSED TO CONTINUOUS LASER RADIATION**
Ekaterina S. Manakhova¹, V. I. Kolesov¹, A. N. Konovalov², V. A. Ulyanov², N. V. Yudin¹
¹Mendeleev University of Chemical Technology, Moscow, Russia
²Federal Research Center “Crystallography and Photonics” of the Russian Academy of Sciences, Moscow, Russia

SECTION 3

Section 3 DENSE PLASMA PHENOMENA

SEPTEMBER 28, TUESDAY

Afternoon session

Hall 2


Co-chairs: Peter A. Loboda

Andrey P. Kuznetsov

Presentations

- 3-9 14³⁰ **MULTI-KJ GLASS LASER SYSTEM “ELF”: CONCEPTUAL DESIGN AND HIGH DENSITY ENERGY RESEARCH PROGRAM**
Andrey P. Kuznetsov¹, V. N. Derkach², S. G. Garanin^{2, 1}, K. L. Gubskiy¹, S. Yu. Gus'kov⁴, Yu. V. Kochetkov¹, V. V. Kravchenko¹, A. V. Mikhaluk¹, A. P. Melekhov¹, I. B. Mukhin⁵, A. A. Solovyoev⁵, S. A. Pikuz^{6, 1}, S. V. Popruzhenko^{3, 1}
¹National Research Nuclear University MEPhI, Moscow, Russia
²Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
³General Physics Institute RAS, Moscow, Russia
⁴Lebedev Physical Institute RAS, Moscow, Russia
⁵Institute of Applied Physics RAS, Nizhny Novgorod, Russia
⁶Joint Institute for High Temperatures RAS, Moscow, Russia
- 3-14 15⁰⁰ **IONIZATION BALANCE OF NON-LTE PLASMAS WITH AVERAGE-ATOM COLLISIONAL-RADIATIVE MODEL**
Anton A. Ovechkin¹, P. A. Loboda¹, A. S. Korolyov¹, S. V. Kol'chugin¹, I. Yu. Vichev², A. D. Solomyannaya², A. S. Grushin², D. A. Kim²
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Keldysh Institute of Applied Mathematics RAS, Moscow, Russia
- 3-22 15²⁵ **CALCULATION OF VISCOSITY AND ION SELF-DIFFUSION COEFFICIENTS IN DENSE PLASMAS WITH PSEUDOATOM MOLECULAR DYNAMICS**
Andrey L. Falkov¹, P. A. Loboda^{1, 2}, A. A. Ovechkin¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²National Research Nuclear University «MEPhI», Moscow, Russia
- 3-4 15⁵⁰ **SIMULATION OF NON-STATIONARY PLASMA**
Ilya Yu. Vichev¹, D. A. Kim^{1, 2}, A. D. Solomyannaya¹, A. S. Grushin¹
¹Keldysh Institute of Applied Mathematics, Moscow, Russia
²National Research Nuclear University “MEPhI”, Moscow, Russia
- 16¹⁵ *Coffee-break*

Co-chairs: Andrey V. Brantov,
Evgeny A. Govras

- 3-1 16³⁰ **ENHANCED ENERGY COUPLING FOR INDIRECT DRIVE FAST IGNITION FUSION TARGETS**
 Feng Zhang
Science and Technology on Plasma Physics Laboratory, Laser Fusion Research Center, CAEP,
Mianyang, China
- 3-2 17⁰⁰ **POWERFUL UNIPOLAR TERAHERTZ PULSES DUE TO TARGET IRRADIATION BY LASER**
Andrey V. Brantov^{1,2}, A. S. Kuratov^{1,2}, V. Yu. Bychenkov^{1,2}
¹Lebedev Physicals Institute of the Russian Academy of Sciences, Moscow, Russia
²Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia
- 3-3 17²⁵ **BRIGHT SYNCHROTRON RADIATION FROM RELATIVISTIC SELF-TRAPPING OF A SHORT LASER PULSE**
Olga E. Vais, M. G. Lobok, V. Yu. Bychenkov
Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia
- 3-12 17⁴⁵ **LASER ACCELERATED ELCECTRONS BASED RADIOTHERAPY**
Maxim G. Lobok, V. Yu. Bychenkov
Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia

SECTION 3

Section 3 DENSE PLASMA PHENOMENA


SEPTEMBER 29, WEDNESDAY

Morning session


Hall 2

Co-chairs: Semyon I. Glazyrin
Nikolay G. Karlykhanov

Presentations

- 3-13 9⁰⁰ **THE 1D-SIMULATIONS OF DIRECT DRIVE DOUBLE-SHELL TARGET FOR MEGAJOULE FACILITIES WITH LASER WAVELENGTH OF 0.35 μm AND 0.53 μm**
Vladimir A. Lykov, A. S. Andreev, V. E. Chernyakov, E. S. Bakurkina, Nikolay G. Karlykhanov, G. N. Rykovanov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 3-6 9³⁰ **HYDRODYNAMICAL STABILITY OF DIRECT DRIVE ICF TARGETS**
Semyon I. Glazyrin, P. P. Zakharov, K. E. Gorodnichev, S. E. Kuratov
Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia
- 3-10 9⁵⁵ **GIGABAR SHOCK WAVES GENERATION FOR THE PURPOSE OF STUDYING THE EQUATION OF STATE OF MATTER**
 Pavel A. Kuchugov^{1,2}, S. Yu. Gus'kov¹, R. A. Yakhin¹
¹Lebedev Physical Institute of RAS, Moscow, Russia
²Keldysh Institute of Applied Mathematics of RAS, Moscow, Russia
- 3-16 10²⁰ **CALCULATIONS OF THERMODYNAMIC PARAMETERS OF METALLIC PLASMA USING SEMI-CLASSICAL AVERAGE ATOM MODEL**
Alexander S. Polyukhin^{1,2}, S. A. Dyachkov^{1,3}, P. R. Levashov^{1,2}
¹Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia
²Moscow Institute of Physics and Technology, Dolgoprudny, Russia
³Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia
- 10⁴⁵ *Coffee-break*

Co-chairs: Igor V. Glazyrin,
Vladimir M. Gubchenko

- 3-7 11¹⁵ **ELECTRON KINETIC DESCRIPTION OF DIAMAGNETIC CLOUD AND QUASIPERPENDICULAR ORDINARY MODE**
Vladimir M. Gubchenko
Institute of Applied Physics RAS, Nizhny Novgorod, Russia
- 3-19 11⁴⁵ **TEST SETUP “ALLUR-P” – COMPACT SIMULATOR ELECTROMAGNETIC PULSES OF THE NANOSECOND RANGE**
 Vladimir S. Sysoev¹, N. N. Shvets¹, A. I. Orlov¹, D. I. Sukharevsky¹, E. V. Basov¹, M. A. Gushchin², A. V. Palitsin², P. A. Mikryukov², I. Yu. Zudin², E. A. Mareev²
¹Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics, department of VNIITF 900, Istra, Russia
²Federal Research Center «Institute of Applied Physics» RAS, Nizhny Novgorod, Russia

- 3-15 12⁰⁵ **METHODS TO MANUFACTURE TARGET REFERENCE LAYERS
FOR HYDRODYNAMIC-INSTABILITY STUDIES IN LASER EXPERIMENTS**



Ludmila E. Peshkicheva, D. S. Nosulenko, D. A. Vikhlyaev, Yu. Yu. Smirnov,
D. I. Bashkin

Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

- 3-18 12²⁵ **ASYMPTOTIC APPROXIMATION OF n^{th} ORDER
AND IMPROVED BOUNDARY CONDITIONS**



Sergey A. Serov

Institute of Theoretical and Mathematical Physics, Russian Federal Nuclear Centre –
All-Russian Scientific Research Institute of Experimental Physics, Sarov, Russia

13⁰⁰ *Lunch*



SECTION 3

Section 3P DENSE PLASMA PHENOMENA

SEPTEMBER 28, TUESDAY 14³⁰ TO 18⁰⁰
SEPTEMBER 29, WEDNESDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

- 3-5 **COULOMB EXPLOSION MODEL OF FLAT HOMOGENEOUS TARGET WITH TWO ION SPECIES**
Ilmar M. Gabdrakhmanov, E. A. Govras
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 3-17 **EXPERIMENTAL STUDIES OF THE CHARACTERISTICS OF PHOTOCATHODES OF THE ULTRAVIOLET SPECTRUM**
Nikolay A. Pkhaiko, A. A. Kondratyev, S. N. Pakhomov, A. V. Potapov, I. A. Sorokin, A. S. Tishchenko, D. I. Bashkin
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 3-21 **RESEARCH OF THE SPECTRAL AND LUMINESCENT CHARACTERISTICS OF NEODYMIUM GLASSES**
Nikolay Yu. Titarenko, A. G. Kakshin, E. A. Loboda
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 3-11 **COMBINED ELECTRICAL EQUIPMENT PROTECTION DEVICES AND LIMITING TYPE FOR POWER DISTRIBUTION ELECTRICAL NETWORKS OF 0.4 kV**
 Nikolay M. Lepyokhin¹, N. N. Shvets¹, V. P. Miroschnichenko¹, A. I. Orlov¹, N. I. Puresev¹, V. S. Sysoev¹, M. Yu. Okhrimenko², E. V. Basov³, N. G. Bulgakova³, V. P. Ivanov³, E. N. Fominich⁴
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, VNITs (department 900), Istra, Russia
²Main Directorate of Special Programs of the Russian Federation President (GUSP), Moscow, Russia
³Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, VEI branch, Moscow, Russia
⁴VI (IT) VA MTO named after General A.V. Khrulyov, Saint Petersburg, Russia
- 3-20 **PARAMETERS OF ELECTRICAL DISCHARGE PROCESSES IN ULTRA-LONG AIR GAPS, AFFECTING THE PROCESS OF GENERATION OF MICROWAVE RADIATION IN THEM**
 Vladimir S. Sysoev¹, L. M. Makalsky², Yu. A. Kuznetsov¹, M. Yu. Naumova¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, department of VNIITF 900, Istra, Russia
²National Research University “Moscow Power Engineering Institute”, Moscow, Russia
- 3-8 **PRODUCTION AND RESEARCH OF LOW-DENSITY METAL MATERIALS**
Alexander G. Kazakov, N. A. Pkhaiko, K. V. Safronov, V. N. Gornov, L. E. Peshkicheva, S. N. Pakhomov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

Section 4 **PROPERTIES OF MATTER AT HIGH-INTENSITY PROCESSES**

SEPTEMBER 28, TUESDAY

Afternoon session

Hall 1

Co-chairs: Mikhail V. Zhernokletov,
Vyacheslav M. Elkin

Presentations

- 14³⁰ **RESEARCH OF MATERIALS DYNAMIC PROPERTIES IN COOPERATION WITH THE INSTANCES OF RUSSIAN ACADEMY OF SCIENCES**
Alexander V. Pavlenko
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-15 15⁰⁰ **SHOCK COMPRESSION OF METAL HYDRIDES**
Mikhail V. Zhernokletov, L. F. Gudarenko, A. A. Kayakin
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 4-44 15²⁰ **SHOCK COMPRESSIBILITY AND EQUATION OF STATE FOR BERYLLIUM OXIDE AT HIGH PRESSURES**
Konstantin V. Khishchenko^{1,2,3,4}, K. K. Krupnikov⁵, Yu. N. Zhugin⁵, A. Yu. Nikolaev⁵, E. B. Smirnov^{5,3}, D. V. Petrov⁵
¹Joint Institute for High Temperatures RAS, Moscow, Russia
²Moscow Institute of Physics and Technology, Dolgoprudny, Russia
³South Ural State University, Chelyabinsk, Russia
⁴Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia
⁵Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-38 15⁴⁰ **CALCULATION OF SHOCK ADIABATS OF ALLOYS AT HIGH ENERGY DENSITIES**
Nikolay N. Seregin^{1,2,3}, K. V. Khishchenko^{1,3,4,5}
¹Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia
²National Research Nuclear University “MEPhI” (Moscow Engineering Physics Institute), Moscow, Russia
³Institute of Problems of Chemical Physics of the Russian Academy of Sciences, Chernogolovka, Russia
⁴Moscow Institute of Physics and Technology, Dolgoprudny, Russia
⁵South Ural State University, Chelyabinsk, Russia
- 16⁰⁰ *Coffee-break*
- 4-39 16³⁰ **RELATIVE STABILITY OF Cu, Ag AND Pt AT HIGH PRESSURES AND TEMPERATURES FROM AB INITIO CALCULATIONS**
Nikolay A. Smirnov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

SECTION 4

- 4-21 16⁵⁰ **EFFECT OF ELECTRONIC HEAT TRANSFER
ON CRYSTALLIZATION KINETICS: ATOMISTIC STUDY**
Roman M. Kichigin^{1,2}, P. V. Chirkov¹, V. V. Dryomov¹, A. V. Karavaev^{1,2}
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University «MEPhI»,
Snezhinsk, Russia
- 4-47 17¹⁰ **MOLECULAR DYNAMICS STUDY OF THE EFFECT OF EXTENDED
INGRAIN DEFECTS ON GRAIN GROWTH KINETICS
IN NANOCRYSTALLINE COPPER**
Pavel V. Chirkov¹, R. M. Kichigin^{1,2}, A. V. Karavaev^{1,2}, V. V. Dryomov¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University «MEPhI»,
Snezhinsk, Russia
- 4-5 17³⁰ **EQUATIONS OF STATE FOR METALS AT HIGH PRESSURES
AND TEMPERATURES NEAR THE LIQUID–VAPOR CRITICAL POINT**
Kseniya A. Boyarskikh^{1,2,3}, K. V. Khishchenko^{1,2,3,4}
¹Joint Institute for High Temperatures RAS, Moscow, Russia
²Moscow Institute of Physics and Technology, Dolgoprudny, Russia
³Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia
⁴South Ural State University, Chelyabinsk, Russia

Section 4 PROPERTIES OF MATTER AT HIGH-INTENSITY PROCESSES








SEPTEMBER 29, WEDNESDAY

Morning session

Hall 1

Co-chairs: Vladimir V. Dremov,
Konstantin V. Khishchenko

Presentations

- 4-1 9⁰⁰ **EXPERIMENTAL RESEARCH ON MATERIAL PROPERTY
AT LASER-DRIVEN EXTREME CONDITIONS**
 Liang Sun, Xiaoxi Duan, Yulong Li, Weiming Yang, Hao Liu, Chen Zhang, Huan Zhang, Zhebin Wang, Jiamin Yang, Shaoen Jiang
Laser Fusion Research Center, Chinese Academy of Engineering Physics, Mianyang, China
- 4-2 9³⁵ **THE HIGH PRESSURE DEPENDENCE OF THE PHASE TRANSITIONS
AND PROPERTIES FOR A POTASSIUM NIOBATE CRYSTAL**
 Tao Zhang¹, Q. Wu¹, X. Wu², HL. He¹
¹Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China
²Institute of System Engineering, China Academy of Engineering Physics, Mianyang, China
- 4-26 10⁰⁵ **CALCULATIONS OF THERMOPHYSICAL PROPERTIES OF METALS
IN THE VICINITY OF MELTING AND LIQUID-GAS COEXISTENCE CURVES
BY QUANTUM MOLECULAR DYNAMICS**
 Dmitry V. Minakov¹, M. A. Paramonov^{1,2}, P. R. Levashov¹
¹Joint Institute for High Temperatures of RAS, Moscow, Russia
²Moscow Institute of Physics and Technology (State University), Moscow, Russia
- 4-32 10²⁵ **AB INITIO INVESTIGATION OF THE HIGH-TEMPERATURE PROPERTIES
OF ZIRCONIUM IN LIQUID AND NEAR-CRITICAL STATES**
 Mikhail A. Paramonov^{1,2}, D. V. Minakov¹, V. B. Fokin¹, P. R. Levashov¹
¹Joint Institute for High Temperatures of RAS, Moscow, Russia
²Moscow Institute of Physics and Technology (State University), Moscow, Russia
- 10⁴⁵ *Coffee-break*
- 4-30 11¹⁵ **MULTIPLE METASTABLE STATES IN CONDENSED MATTER
AND MOMENTUM TRANSFER MECHANISMS UNDER INTENSIVE LOADING**
 Oleg B. Naimark
Institute of Continuous Media Mechanics UB RAS, Perm, Russia
- 4-7 11³⁵ **POSSIBILITY OF RAMP COMPRESSION OF METALS TO 40 MBAR BY LINER
IMPLOSION DRIVEN BY DISK EXPLOSIVE MAGNETIC GENERATORS**
 Anatoly M. Buyko
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 4-8 11⁵⁵ **ATOMISTIC AND CONTINUUM MODELING OF FRACTURE
OF REFRACTORY METALS**
 Dmitry S. Voronin, A. E. Mayer
Chelyabinsk State University, Chelyabinsk, Russia

SECTION 4

- 4-36 12¹⁵ **IMPACT TESTS WITH PROFILED COPPER CYLINDERS WITH A RIGID WALL:
EXPERIMENT AND MICROSTRUCTURAL ANALYSIS**



Egor S. Rodionov, V. G. Lupanov, N. A. Grachyova, P. N. Mayer, A. E. Mayer
Chelyabinsk State University, Chelyabinsk, Russia

- 4-23 12³⁵ **MULTISCALE MODELING OF THE DYNAMIC PLASTICITY
OF ALUMINUM ALLOYS**



Vasily S. Krasnikov, A. E. Mayer, V. V. Pogorelko, E. V. Fomin, D. S. Voronin,
F. T. Latypov,
P. A. Bezborodova, A. A. Ebel
Chelyabinsk State University, Chelyabinsk, Russia

13⁰⁰ *Lunch*

Afternoon session

Co-chairs: Igor V. Lomonosov,
Vladislav I. Tarzhanov

- 4-25 14³⁰ **STUDIES OF THE PROPERTIES OF SUBSTANCES
UNDER EXTREME CONDITIONS IN THE WORKS OF THE IPCP RAS**

Igor V. Lomonosov
Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia

- 4-40 15⁰⁰ **EXPERIMENTAL AND COMPUTATIONAL-THEORETICAL STUDY
OF THE SPALL STRENGTH OF ALUMINUM
UNDER INTENSE IMPULSE ACTION**

Igor A. Stuchebyukhov¹, A. Yu. Semyonov¹, K. V. Khishchenko²
¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia
²Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, Russia

- 4-29 15²⁰ **INVESTIGATION OF THE BEHAVIOR OF POLYCARBONATE PK-ET-3,5
UNDER SHOCK IMPACT**

Mikhail S. Mytarev, A. V. Pavlenko, S. N. Malyugina, A. S. Mayorova, D. N. Kazakov,
S. S. Mokrushin
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

- 4-37 15⁴⁰ **EFFECT OF GRAPHENE ON THE RESISTANCE OF ALUMINUM OXIDE
TO ELECTROPHYSICAL AND DYNAMIC MECHANICAL ACTIONS**

Georgy G. Savenkov^{2,3}, A. Yu. Konstantinov¹, A. V. Kuznetsov², V. V. Stolyarov⁴
¹Resarch Institute of Mechanics, Lobachevsky State University Nizhny Novgorod, Nizhny Novgorod,
Russia
²Armalit Machine-building plant, St. Petersburg, Russia
³St. Petersburg State Technological Institute (Technical University), St. Petersburg, Russia
⁴Blagonravov Institute of Engineering Science, Russian Academy of Sciences, Moscow, Russia

16⁰⁰ *Coffee-break*

- 4-11 16³⁰ **NONEQUILIBRIUM OF THE PHYSICAL STATE OF COPPER
UNDER SHOCK COMPRESSION**

Sergey D. Gilyov
Lavrentyev Institute of Hydrodynamics, Siberian Branch of the Russian Academy of Sciences,
Novosibirsk, Russia

- 4-18 16⁵⁰ **EXPERIMENTAL STUDIES OF SHOCK-LOADED SPECIMENS' DYNAMICS BY COMBINATION OF LASER AND OPTICAL TECHNIQUES**
Vladimir G. Kamenev¹, Yu. D. Arapov¹, P. V. Kubasov¹, P. N. Yaroshchuk¹,
D. P. Kuchko², D. G. Pankratov², V. I. Tarzhanov², A. V. Vorobyov², A. G. Poptsov²
¹Dukhov Research Institute of Automatics, Moscow, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-48 17¹⁰ **REVISED MOBILE ACCELERATOR BASED ON BETATRON OF BIM TYPE**
Oleg A. Shamro, Yu. P. Kuropatkin, V. I. Nizhegorodtsev, I. N. Romanov, K. V.
Savchenko, V. D. Selemir, E. V. Urlin, V. A. Fomichev, A. A. Chinin
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 4-24 17³⁰ **MODELING THE DYNAMIC EXTRUSION PROCESS OF MATERIALS THROUGH A DIE WITH COMPLEX GEOMETRY**
Pavel A. Kuznetsov, A. P. Yalovets
South Ural State University (National Research University), Chelyabinsk, Russia

SECTION 4

Section 4 PROPERTIES OF MATTER AT HIGH-INTENSITY PROCESSES





SEPTEMBER 30, THURSDAY

Afternoon session





Hall 1

Co-chairs: Evgeny V. Shorokhov,
Evgeny F. Gryaznov

Presentations

- 4-28 14³⁰ **MODELING OF QUADROMORPHIC TEXTURE OF THE CHELYABINSK METEORITE**
 Razilya F. Muftakhetdinova, V. I. Grokhovsky, G. A. Yakovlev
Ural Federal University named after the first President of Russia B.N. Yeltsin, Ekaterinburg, Russia
- 4-16 14⁵⁰ **INFLUENCE OF THE INTENSITY OF EXPLOSIVE LOADING ON THE CONVERGENCE OF COPPER CYLINDRICAL SHELLS**
 Vitaly I. Zeldovich¹, A. E. Kheifets¹, N. Yu. Frolova¹, A. A. Degtyaryov¹, E. B. Smirnov², E. V. Shorokhov²
¹M. N. Mikheev Institute of Metal Physics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics, Snezhinsk, Russia
- 4-46 15¹⁰ **THE STRUCTURAL-PHASE TRANSFORMATIONS AND PROPERTIES OF SUBMICROCRYSTALLINE COPPER ALLOYS UNDER DYNAMIC LOADING**
 Irina V. Khomskaya¹, V. I. Zeldovich¹, E. V. Shorokhov², S. V. Razorenov³, D. N. Abdullina¹, N. Yu. Frolova¹, A. E. Kheifets¹
¹M. N. Mikheev Institute of Metal Physics of the Ural Branch of RAS, Ekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
³Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia
- 4-6 15³⁰ **SYNTHESIS, STRUCTURE AND PROPERTIES OF ALUMINUM COMPOSITES WITH GRAPHENE**
 Irina G. Brodova¹, L. A. Yolshina², E. V. Shorokhov³, D. Yu. Rasposienko¹, I. G. Shirinkina¹, A. N. Petrova¹, S. V. Razorenov^{4,5}, K. V. Gaan³, R. V. Muradymov²
¹M. N. Mikheev Institute of Metal Physics, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
²Institute of High-Temperature Electrochemistry, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
³Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics, Snezhinsk, Russia
⁴Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Russia.
⁵National Research Tomsk State University, Tomsk, Russia

15⁵⁰ *Coffee-break*

- 4-3 16²⁰ **THE DYNAMIC PROPERTIES OF SUBMICROCRYSTALLINE COPPER ALLOYED WITH ZIRCONIUM, CHROMIUM AND GRAPHENE**
 Darya N. Abdullina¹, I. V. Khomskaya¹, S. V. Razoryonov², L. A. Elshina³, E. V. Shorokhov⁴
¹M. N. Mikheev Institute of Metal Physics of the Ural Branch of RAS, Ekaterinburg, Russia
²Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia
³The Institute of High Temperature Electrochemistry of the Ural Branch of RAS, Ekaterinburg, Russia
⁴Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics, Snezhinsk, Russia
- 4-41 16⁴⁰ **EFFECT OF DEFORMATION BY DYNAMIC CHANNEL-ANGULAR PRESSING AND HIGH PRESSURE TORSION ON THE STRUCTURE AND PROPERTIES OF HAFNIUM BRONZE**
 Ruslan M. Falahutdinov¹, V. V. Popov¹, E. N. Popova¹, A. V. Stolbovsky¹, K. V. Gaan², E. V. Shorokhov²
¹M. N. Miheev Institute of Metal Physics Ural Branch of RAS, Ekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-34 17⁰⁰ **STRUCTURAL TRANSFORMATIONS IN HAFNIUM BRONZE UPON HEATING AFTER QUENCHING AND DEFORMATION BY DYNAMIC CHANNEL-ANGULAR PRESSING AND HIGH PRESSURE TORSION**
 Vladimir V. Popov¹, R. M. Falahutdinov¹, E. N. Popova¹, A. V. Stolbovsky¹, K. V. Gaan², E. V. Shorokhov²
¹M. N. Miheev Institute of Metal Physics Ural Branch of RAS, Ekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-50 17²⁰ **STRUCTURE AND PROPERTIES OF AK6 ALLOY PRODUCED BY SELECTIVE LASER MELTING**
 Irina G. Shirinkina¹, I. G. Brodova¹, A. N. Klyonov², E. B. Smirnov², N. Yu. Orlova², V. V. Astaf'ev¹, T. I. Yablonskikh¹
¹M. N. Mikheev Institute of Metal Physics, Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
³Snezhinsk Institute of Physics and Technology National Research Nuclear University "MEPhI", Snezhinsk, Russia



SECTION 4

Section 4P PROPERTIES OF MATTER AT HIGH-INTENSITY PROCESSES

SEPTEMBER 28, TUESDAY 14³⁰ TO 18⁰⁰
SEPTEMBER 29, WEDNESDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

- 4-10 **ELECTRIC RESISTANCE OF COPPER AT STRONG COMPRESSION: EQUILIBRIUM MODEL AND SHOCK-WAVE EXPERIMENT**
Sergey D. Gilyov
Lavrentyev Institute of Hydrodynamics, SB RAS, Novosibirsk, Russia
- 4-9 **FEW-PARAMETER EQUATION OF STATE OF METALS**
Sergey D. Gilyov
Lavrentyev Institute of Hydrodynamics, SB RAS, Novosibirsk, Russia
- 4-13 **NEW DATA ON DYNAMIC PROPERTIES OF BERYLLIUM IN THE $10^3\div 10^5$ s⁻¹ DEFORMATION RATE RANGE**
Andrey A. Degtyaryov¹, A. E. Kovalyov^{1,3}, A. V. Kal'manov², F. F. Galiev², E. V. Koshatova²
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
³South Ural State University (National Research University), Chelyabinsk, Russia
- 4-14 **IN-MOLD MODIFICATION OF COPPER**
 Alexander A. Zhdanok¹, V. A. Kuznetsov¹, Z. A. Korotaeva¹ and N. V. Stepanova²
¹Institute of Solid State Chemistry and Mechanochemistry, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia
²Novosibirsk State Technological University, Novosibirsk, Russia
- 4-19 **EQUATION OF STATE OF HYDROGEN FOR POWER ENGINEERING**
Alexey V. Karavaev, V. V. Dryomov, E. E. Mironova
Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-20 **SEASONAL CREEP VARIATIONS OF EXTREMELY STRESSED SOLID SAMPLES**
 Farshed H. Karimov, N. G. Salomov
Institute of Geology, Earthquake Engineering and Seismology National Academy of Sciences of Tajikistan, Dushanbe, Tajikistan
- 4-22 **HIGH STRAIN RATES OF STAINLESS-STEEL SOLID AND VOLUME-PERIODIC SPECIMENS MANUFACTURED USING ADDITIVE TECHNOLOGY OVER RATE RANGE $10^2\text{--}10^3$ SEC⁻¹**
Alexander I. Klenov, A. Yu. Garmashev, E. B. Smirnov, E. A. Petukhov, K. S. Sidorov, M. A. Shistirikov, D. T. Yusupov, Z. I. Zavialov, A. A. Bortsov
Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-27 **A WIDE-RANGE MULTIPHASE EQUATION OF STATE FOR PLATINUM**
Vadim N. Mikhaylov, V. M. El'kin, A. A. Ovechkin, N. A. Smirnov
Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia

- 4-31 **SPEEDS OF SOUND IN LEAD UNDER DYNAMIC LOADING**
Denis G. Pankratov, A. K. Yakunin, A. G. Poptsov, V. N. Mikhaylov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-33 **CONSTRUCTION OF THE EQUATION OF STATE OF THE EPOXY RESIN BASED ON EXPERIMENTAL DATA ON SHOCK-WAVE LOADING**
Evgeny V. Pomykalov, Yu. M. Kovalev
South Ural State University, Chelyabinsk, Russia
- 4-35 **SOUND VELOCITY IN SHOCK-LOADED URANIUM WITHIN THE RANGE FROM 20 TO 250 GPa**
Akim V. Vorobyov, A. G. Poptsov, D. G. Pankratov, A. K. Yakunin, D. T. Yusupov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 4-42 **MOTION OF LOW-ANGLE SYMMETRIC TILT GRAIN BOUNDARIES IN PURE FCC METALS AND Al-Cu ALLOYS**
Evgeny V. Fomin¹, A. E. Mayer^{1,2}, V. S. Krasnikov^{1,2}
¹Chelyabinsk State University, Chelyabinsk, Russia
²South Ural State University, Chelyabinsk, Russia
- 4-43 **MOBILE POWER SUPPLY SYSTEM FOR ELECTROMAGNET OF A BIM TYPE BETATRON**
Kirill V. Savchenko, V. A. Fomichyov, Yu. P. Kuropatkin, V. I. Nizhegorodtsev, I. N. Romanov, V. D. Selemir, E. V. Urlin, A. A. Chinin, O. A. Shamro
Russian Federal Nuclear Center – All-Russia Scientific
Research Institute of Experimental Physics, Sarov, Russia
- 4-45 **PHASE TRANSFORMATIONS OF CHROMIUM AT HIGH PRESSURES AND TEMPERATURES**
Konstantin V. Khishchenko^{1,2,3,4}
¹Joint Institute for High Temperatures RAS, Moscow, Russia
²Moscow Institute of Physics and Technology, Dolgoprudny, Russia
³South Ural State University, Chelyabinsk, Russia
⁴Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia
- 4-49 **SOME FEATURES OF SELECTIVE LASER ALLOYING OF ALUMINUM-BASED POWDER UNDER CONDITIONS OF LASER-INITIATED CHEMICAL REACTIONS**
Vladimir G. Shevchenko, D. A. Eselevich, A. V. Konyukova
Institute of Solid State Chemistry UB RAS, Ekaterinburg, Russia
- 4-51 **NUMERICAL SIMULATION OF SHOCK-WAVE EXPERIMENTS USING SYNCHROTRONIC DIAGNOSTICS**
Alexander P. Yalovets, E. S. Shestakovskaya, N. L. Klinacheva
South Ural State University (National research university), Chelyabinsk, Russia

SECTION 5

Section 5 **SCIENTIFIC BASES OF NUCLEAR POWER ENGINEERING AND NUCLEAR MATERIALS**

SEPTEMBER 29, WEDNESDAY



Afternoon session

Hall 2

Co-chairs: Dmitry V. Khmel'nitsky,
Vyacheslav P. Sokolov

Presentations

- 5-12 14³⁰ **CODE SYSTEM FOR NUMERICAL JUSTIFICATION OF TECHNICAL SOLUTIONS IN THE COURSE OF CLOSED FUEL CYCLE TECHNOLOGIES DEVELOPMENT**
Inga R. Makeeva
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 5-20 14⁴⁵ **THE USE OF SOFTWARE PACKAGE VIZART FOR MODELING VARIOUS SCENARIOS OF THE CNFC IMPLEMENTATION AND OPTIMIZING THE COSTS OF RADIOACTIVE WASTE TREATMENT**
Laysan R. Fayrushina^{1,2}, I. R. Makeeva^{1,3}, V. Yu. Pugachyov¹, N. D. Dyrda¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
³Federal State Autonomous Educational Institution of Higher Education “South Ural State University (National Research University)”, Chelyabinsk, Russia
- 5-14 15⁰⁰ **THE DEVELOPMENT OF THE METHODOLOGY FOR THE CALCULATED ASSESSMENT FIRE AND EXPLOSION SAFETY OF TECHNOLOGICAL RADIOCHEMICAL PROCESSES**
Igor V. Peshkichev¹, Y. S. Dramoretskaya¹, I. R. Makeeva¹, A. V. Rodin²
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Scientific and Engineering Centre for Nuclear and Radiation Safety, Moscow, Russia
- 5-17 15¹⁵ **COMPONENTS OF THE SAFETY OF NUCLEAR FACILITIES**
Alexander A. Sadovskiy
Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
- 5-7 15³⁰ **ENSURING NUCLEAR NONPROLIFERATION REGIME WHEN EXPORTING CFC FAST REACTORS**
Nikolay V. Gorin¹, E. V. Kuznetsov¹, N. P. Voloshin¹, Yu. I. Chyurikov¹,
A. N. Chebeskov², V. P. Kuchinov³, E. O. Adamov⁴, V. V. Shidlovsky⁴
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²A. I. Lypunsky Institute for Physics and Power Engineering, Obninsk, Russia
³NRNU MEPhI, Moscow, Russia
⁴JSC “Proryv”, Moscow, Russia

- 5-6 15⁴⁵ **DETECTION OF VIOLATIONS OF NUCLEAR NONPROLIFERATION OBLIGATIONS BY STATE IMPORTER OF CLOSED FUEL CYCLE FAST REACTOR**
 Nikolay V. Gorin¹, A. L. Karmanov¹, V. N. Pervinenko¹, V. V. Vlasov¹, N. A. Teplykh¹, V. P. Kuchinov², A. N. Chebeskov³, V. V. Shidlovsky⁴
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²National Research Nuclear University “MEPhI”, Moscow, Russia
³A. I. Leypunsky Institute for Physics and Power Engineering, Obninsk, Russia
⁴JSC “Proryv”, Moscow, Russia
- 16⁰⁰ *Перерыв*
- 5-1 16³⁰ **THE STRUCTURAL STUDY OF URANYL(VI) AND PEPTIDE COMPLEXES BY MASS SPECTROMETRY AND DFT CALCULATION**
 S. Shi, Z. Qin, Y. Ren, S. Wang, X. Wang
 Institute of Materials, China Academy of Engineering Physics, P. R. China
- 5-3 16⁵⁰ **COMPUTATIONAL ANALYSIS OF INTEGRAL EXPERIMENTS WITH SPHERICAL AND CYLINDRICAL PLUTONIUM ASSEMBLIES**
 Vladimir A. Adarchenko, D. V. Khmel'nitsky, S. V. Samarina, L. S. Ershova, O. O. Rubtsova
 Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 17⁰⁵ **1.5D MATHEMATICAL MODEL OF SOLUTION REACTOR DYNAMICS**
 Nikolay V. Lopukhov, S. A. Korablev
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 17²⁰ **RESEARCH OF RADIATION SAFETY AND IRRADIATION CAPABILITIES OF GAMMA-MACHINE**
 Sergey A. Demyanov, E. I. Valezhanina, A. V. Mashagin, P. V. Openyshev, K. A. Popikov
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 5-15 17³⁰ **THE ROLE OF SIA CLUSTERS IN CALCULATION OF EFFECTIVE IRRADIATION DOSE**
 Pavel A. Pokatashkin, A. V. Yanilkin
 Dukhov Research Institute of Automatics, Moscow, Russia
- 5-10 17⁴⁰ **COMPUTATIONAL AND EXPERIMENTAL STUDY OF PROBLEMS OF IMPROVING THE SAFETY OF OPERATION OF FUNCTIONAL MATERIALS OF MODERN REACTORS**
 Elena I. Kurbatova¹, A. I. Ksenofontov², D. A. Savin²
¹Nuclear safety institute of the Russian Academy of Sciences, Moscow, Russia
²National Research Nuclear University “MEPhI”, Moscow, Russia
- 5-13 17⁵⁰ **DIFFUSION AND MECHANISMS OF THORIUM CATION MIGRATION IN ThO₂ CRYSTAL. A MOLECULAR DYNAMIC SIMULATION**
 Kirill A. Nekrasov^{1,2}, D. Seitov², S. S. Pitskhelaury², A. S. Boyarchenkov²
¹Institute of High-Temperature Electrochemistry of the Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia
²Ural Federal University named after the first President of Russia B. N. Yeltsin, Yekaterinburg, Russia

SECTION 5

Section 5 SCIENTIFIC BASES OF NUCLEAR POWER ENGINEERING AND NUCLEAR MATERIALS


SEPTEMBER 30, THURSDAY

Afternoon session

Hall 2

Co-chairs: Vadim A. Simonenko,
Igor A. Kirillov

Presentations

- 14³⁰ **SYSTEMATIC CHALLENGES OF HYDROGEN POWER PRODUCTION TECHNOLOGY SAFETY AND OPERATION**
Vadim A. Simonenko
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 5-9 14⁵⁰ **ON THE BALL FLAMES-TO-DEFLAGRATION TRANSITION IN HYDROGEN-AIR MIXTURES**
Igor A. Kirillov
National Research Center “Kurchatov Institute”, Moscow, Russia
- 5-5 15⁰⁵ **MODELING THE PROPAGATION OF “FLOATING” AND “CELLULAR” FLAMES**
Igor V. Glazyrin¹, N. B. Anikin¹, I. A. Kirillov², O. G. Kotova¹, N. A. Mikhailov¹,
A. V. Pavlenko¹, V. A. Simonenko¹, A. A. Tyaktev¹, M. N. Chizhkov¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²National Research Center Kurchatov Institute, Moscow, Russia
- 5-8 15⁰⁵ **SHAPE AND DYNAMICS OF CYLINDRICALLY EXPANDING ULTRALEAN HYDROGEN-AIR FLAMES STUDIED IN THE EXPERIMENTS IN A NARROW HORIZONTAL CHANNEL**
Valery P. Denisenko¹, S. S. Kingsep¹, I. A. Kirillov¹, A. S. Melikho², V. Yu. Plaksin³
¹National Research Center “Kurchatov Institute”, Moscow, Russia,
²Federal State Budgetary Establishment “All-Russian Research Institute for Fire Protection of the Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters”, Balashikha, Russia
³KintechLab, Moscow, Russia
- 15³⁵ **PRESENTATION OF POSTERS**
- 16⁰⁰ *Перерыв*
- 5-21 16³⁰ **DEVELOPMENT OF APPROACHES TO ESTABLISHING UNIFORM REGULATORY REQUIREMENTS FOR ASSESSING EFFECTIVENESS AND SAFE OPERATION LIMITS OF PASSIVE CATALYTIC HYDROGEN RECOMBINERS**
 Nataliya L. Kharitonova¹, I. A. Kirillov¹, V. A. Simonenko², E. V. Bezgodov²
¹National Research Center “Kurchatov Institute”, Moscow, Russia
²Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

- 5-4 16⁴⁵ **PAR CHARACTERISTICS ASSESSMENT TECHNIQUE DEVELOPMENT**
Evgeny V. Bezgodov^{1,2}, V. M. Kryukov¹, S. D. Pasyukov¹, M. V. Nikiforov¹,
A. A. Tarakanov¹, I. A. Popov¹, D. L. Moshkin¹, Yu. F. Davletchin¹, V. A. Simonenko^{1,2}
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Federal State Independent Educational Institution “Snezhinsk Physics and Technology Institute
of the National Research Nuclear University MEPhI”, Snezhinsk, Russia
- 5-22 17⁰⁰ **DEVELOPMENT OF TEST FACILITY BM-P MODEL TO TEST
OF PASSIVE AUTOCATALYTIC HYDROGEN RECOMBINERS**
Ekaterina M. Shchennikova^{1,2}, Y. A. Tomilov^{1,2}
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”,
Snezhinsk, Russia

SECTION 5

Section 5P SCIENTIFIC BASES OF NUCLEAR POWER ENGINEERING AND NUCLEAR MATERIALS

SEPTEMBER 29, WEDNESDAY C 14³⁰ ДО 18⁰⁰

SEPTEMBER 30, THURSDAY C 8⁴⁰ ДО 13⁰⁰

Foyer

Posters

- 5-19 **RFNC – VNIITF RESEARCH COMPLEX DESIGNED
FOR OBTAINING EXPERIMENTAL DATA ON HAZARDOUS FACTORS
OF OUTFLOW, COMBUSTION, AND EXPLOSION OF HYDROGEN-CONTAINING
GAS MIXTURES**
Artyom A. Tarakanov, N. B. Anikin, E. V. Bezgodov, Yu. F. Davletchin, D. L. Moshkin,
M. Yu. Nikiforov, S. D. Pasyukov, I. A. Popov, A. A. Tyaktev, Yu. S. Ufimtsev, A. V. Ushkov,
D. V. Frolov, V. A. Simonenko
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 5-11 **ULTRASONIC ACTIVATION
OF THE DISPERSED ALUMINUM OXIDATION PROCESS BY WATER**
Mikhail N. Larichev, N. S. Shaitura
N. N. Semenov Federal Research Center for Chemical Physics, Russian Academy of Sciences, Moscow,
Russia
- 5-16 **CALCULATION OF THE PYRAMIDAL OBJECTS MAGNETIC FIELD
IN COMSOL MULTIPHYSICS**
Vasily V. Saveliev, V. A. Sapunov, A. V. Sergeev
Ural Federal University named after the First President of Russia B. N. Yeltsin, Yekaterinburg, Russia

**Section 6 NUMERICAL METHODS, ALGORITHMS, CODES
AND ACCURATE SOLUTIONS**

SEPTEMBER 30, THURSDAY

Morning session

Hall 1

Co-chairs: Alexey A. Bragin,
Semyon V. Senchukov

Presentations

- 6-19 9⁰⁰ **THE MODEL AND THE 1D-SIMULATIONS OF A TARGET IN SPHERE-SHAPED HOHLRAUM WITH THE CONSIDERATION OF THE X-RAY RADIATION LOSSES THROUGH LASER ENTRANCE HOLES**
Nikolay G. Karlykhanov, V. A. Lykov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-7 9²⁰ **ON THE NUANCES OF THE IMPLEMENTATION AND APPLICATION OF (k - ϵ)-TURBULENCE MODEL IN THE FINITE VOLUME METHOD**
Maxim I. Boldyrev, I. V. Glazyrin, N. A. Mikhailov, M. N. Chizhkov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-8 9⁴⁰ **COMPUTATIONAL SUBSTANTIATION OF WEDGE PLUG STRENGTH AT DIFFERENT HE CHARGE SIZES**
Ivan O. Borovsky, S. V. Balushkin, G. V. Kulikov, M. A. Lipatnikov, M. V. Nikulshin, A. Yu. Simonov, A. N. Khrulyov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 10⁰⁰ **CHOICE OF SOLUTION METHOD FOR HEAT CONDUCTION EQUATION IN SMOOTHED PARTICLES HYDRODYNAMICS (SPH) METHOD**
Vasily S. Rykovanov, F. A. Sapozhnikov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-36 10²⁰ **INFLUENCE OF INITIAL PARTICLE CONFIGURATION UPON SPHERICITY OF SHOCK LOADED DENSITY INTERFACE DURING SPH MODELING OF RICHTMYER–MESHKOV INSTABILITY**
Filipp A. Sapozhnikov, V. S. Rykovanov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 10⁴⁵ *Coffee-break*
- 6-32 11¹⁵ **THE PROBLEM OF CENTERED RAREFACTION WAVE REFLECTED FROM A “SOFT” PISTON**
Vladimir N. Nogin
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia

SECTION 6

- 6-6 11³⁵ **NUMERICAL SIMULATION OF SHOCKLESS GAS COMPRESSION FROM REST TO REST WITH GIVEN EXTERNAL INFLUENCE**
Sergey P. Bautin, Yu. V. Nikolaev
Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”,
Snezhinsk, Russia
- 6-23 11⁵⁵ **ANALYTICAL AND NUMERICAL SIMULATION GAS FLOWS IN UPLINING SWIRLED STREAMS**
Irina Yu. Krutova
Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”,
Snezhinsk, Russia
- 6-42 12¹⁵ **INCORPORATING SPECTRAL AND KINETIC EFFECTS IN THE RADIATIVE HEAT TRANSFER APPROXIMATION FOR RADIATIVE TRANSFER SIMULATIONS IN TWO-DIMENSIONAL AXISYMMETRIC CASE ON RECTANGULAR MESH**
Alyona D. Khmel'nitskaya, N. G. Karlykhanov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-20 12³⁵ **DYNAMIC LOAD BALANCING ALGORITHM FOR CONTINUUM MECHANICS PROBLEMS WITH ESSENTIAL REDISTRIBUTION OF COMPUTING LOADS AMONG THE PROCESSES**
Atyom V. Karpeev
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 13⁰⁰ *Lunch*

**Section 6 NUMERICAL METHODS, ALGORITHMS, CODES
AND ACCURATE SOLUTIONS**







OCTOBER 1, FRIDAY

Morning session




Hall 1

Co-chairs: Vladimir V. Dremov,
Yan V. Pronin

Presentations

- 6-41 9⁰⁰ **PRESSURE CAPSULE STRENGTH AT ACCIDENTAL FALLING
FROM 9 METERS HEIGHT**
Natalya N. Tulaeva, M. A. Lipatnikov, I. V. Minaev, M. V. Nikulshin, A. A. Tabatchikov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-13 9²⁰  **NUMERICAL SIMULATION OF IMPACT TESTS OF PROFILED
COPPER CYLINDERS WITH A RIGID WALL**
Natalya A. Grachyova, A. E. Mayer, E. S. Rodionov
Chelyabinsky State University, Chelyabinsk, Russia
- 6-17 9⁴⁰  **NUMERICAL SIMULATIONS RESULTS CONCERNING SHIELD
PENETRATIONS BY 3D DEBRIS**
Olga S. Ilyutina, M. Yu. Sakharov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-44 10⁰⁰  **MONOTONOUS METHOD OF FRACTIONAL PARTICLES
FOR TWO-DIMENTIONAL ELASTOPLASTIC FLOWS**
Ilma E. Cherednichenko, V. A. Smelyov, Yu. V. Yanilkin
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 6-40 10¹⁵  **METHOD OF SOLVING HEAT CONDUCTION PROBLEMS TAKING
INTO ACCOUNT ABLATIVE MASS LOSS IN THE “LOGOS HEAT” MODULE**
Roman A. Trishin, V. A. Glazunov, Yu. D. Seryakov
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 10³⁰  **NUMERICAL SIMULATION OF SHOCK WAVES PROPAGATION USING
MOBILE UNSTRUCTURED MESHES IN “LOGOS-VOLNA” SOFTWARE**
Elena A. Veselova
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics,
Sarov, Russia
- 10⁴⁵ *Coffee-break*
- 6-3 11¹⁵  **PHASE TRANSITIONS AND EQUATION OF STATE OF B HMX
UNDER HIGH PRESSURE**
Sui Zhilei, Chong Tao, Zheng Xian-xu
National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, China
Academy of Engineer Physics, Mianyang, China

SECTION 6

- 6-2 11⁴⁵ **THE THEORETICAL MODEL OF TENSILE STRENGTH FOR PBXS**
 Li Ke-wu, Fu Hua, Li Tao, Zheng Xian-xu
National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, China
Academy of Engineer Physics, Mianyang, China
- 6-1 12¹⁵ **THREE-DIMENSIONAL NUMERICAL SIMULATION OF STEVEN TEST
BY A COMBINED FINITE-DISCRETE ELEMENT METHOD**
 Huang Bin-bin, Fu Hua, Yu Yin, Li Tao
National Key Laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, China
Academy of Engineer Physics, Mianyang, China
- 6-4 12⁴⁵ **SIMULATION OF CRACK FORMATION IN LOCAL INTRUSION
OF PBX USING 3D DISCRETE ELEMENT METHOD**
 Wei Yi, Hu Qiushi, Fu Hua, Li Tao
Institute of Fluid Physics, China Academy of Engineer Physics, Mianyang, China
- 13⁰⁰ *Lunch*


**Section 6P NUMERICAL METHODS, ALGORITHMS, CODES
AND ACCURATE SOLUTIONS**

**SEPTEMBER 29, WEDNESDAY 14³⁰ TO 18⁰⁰
SEPTEMBER 30, THURSDAY 8⁴⁰ TO 13⁰⁰**

Foyer

Posters

- 6-37 **EGIDA-TEST-GPU. ADAPTATION OF THE EGAK METHOD TO GPU COUNTING**
 Evgeny A. Sizov, A. M. Erofeev
 Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov,
 Russia
- 6-29 **IMPLEMENTATION AND TESTING OF A MULTI-TEMPERATURE HYDRODYNAMIC
APPROXIMATION IN A THREE-DIMENSIONAL FOCUS PROGRAM**
 Kirill S. Nazarov, I. V. Glazyrin, N. A. Mikhailov
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-50 **2D CALCULATIONS OF TWO-CASCADE TARGET COMPRESSION
AND COMBUSTION IN INDIRECT-DRIVE ICF**
 Lev V. Sokolov, A. N. Shushlebin, V. A. Lykov, D. V. Boretskikh
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-12 **NUMERICAL STUDY OF SOLUTION STABILITY
FOR THE POINT EXPLOSION PROBLEM**
 Vladimir I. Volkov, N. S. Eskov, V. N. Nogin
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-38 **INFLUENCE OF THE MAXIMUM WATER DENSITY ON THE COOLING
OF A WATER-SATURATED POROUS MEDIUM**
 Oleg A. Simonov¹, L. N. Filimonova²
¹Federal State Institution Federal Research Center Tyumen Scientific Center of Siberian Branch of the
 Russian Academy of Sciences, Tyumen, Russia
²Khrstianovich Institute of Theoretical and Applied Mechanics, Tyumen Branch, Siberian Branch, Russian
 Academy of Sciences, Tyumen, Russia
- 6-43 **TEXACT SOLUTION OF GENERALIZED ISING MODEL ON A SQUARE LATTICE
BY VDOVICHENKO–FEYNMAN COMBINATORIAL METHOD**
 Egor S. Tsuvarev, F. A. Kassan-Ogly
 M. N. Mikheev Institute of Metal Physics of the Ural Branch of the Russian Academy of Sciences,
 Yekaterinburg, Russia
- 6-34 **NUMERICAL SIMULATION OF BOTTOM PARTS OF A TORNADO
AND A TROPICAL CYCLONE IN A STATIONARY CASE**
 Olga V. Opryshko
 Snezhinsk Physics and technology Institute National Research Nuclear University “MEPhI”, Snezhinsk,
 Russia

- 6-9 **PARTICULAR SOLUTIONS OF A LINEARIZED HYDRODYNAMICS EQUATIONS WITH CORIOLIS FORCE**
Anna A. Bugayenko^{1,2}, I. Y. Krutova²
¹Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
- 6-16 **STATE OF THE IMPACTOR UNDER PENETRATION INTO CONCRETE**
Elena Yu. Emel’yanova, V. V. Dotsenko, M. V. Nikul’shin, V. V. Titov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-27 **SOLVING HEAT CONDUCTION ON ADAPTIVELY EMBEDDED MESHES BY SUBSTITUTION**
Artyom M. Mustafin, S. N. Lebedev, N. N. Pashentseva
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-45 **SIMULATION OF LASER RADIATION TRANSFER AND ABSORPTION IN ICF INDIRECT IRRADIATION TARGETS**
Ilya S. Chubareshko, A. V. Vronsky, A. A. Shestakov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-47 **THE PROBLEM OF ILL CONDITIONING IN SOLVING HEAT TRANSFER EQUATIONS**
Alexander A. Shestakov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-48 **TEST PROBLEMS ON SHOCK COMPRESSION OF LAYERED SPHERICAL SYSTEMS**
Alexander A. Shestakov
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-46 **SPECTRAL EFFECTS OF RADIATIVE TRANSFER IN DIFFERENT APPROXIMATIONS AND THE DEVELOPMENT OF SHORT-WAVE PERTURBATIONS IN ICF TARGETS**
Alexander A. Shestakov, V. A. Lykov, E. L. Lyagina
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-18 **THE ANALYTICAL DECISION OF THE CHARACTERISTIC TASK CAUCHY WITH INITIAL DATA DESCRIBING THE TURNING OF GAS**
 Alexey O. Kazachinsky
Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
- 6-21 **NUMERICAL SIMULATION USING CYLINDRICAL COORDINATES OF AN RISING SWIRLING FLOW**
Sergey N. Kononov^{1,2}, S. P. Bautin¹, E. S. Levunina^{1,3}
¹Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
²South Ural State University, Ozersk, Russia
³FSUE “PO “Mayak”, Ozersk, Russia

6-33 **NUMERICAL SIMULATION OF THE IMPACT OF A HEAT SOURCE ON THE FLOW OF GAS IN AN ASCENDING SWIRLING FLOW**

Alexander G. Obukhov

Tyumen Industrial University, Tyumen, Russia

6-15 **PHOTOLUMINESCENCE THEORETICAL DESCRIPTION OF NANOCOMPOSITE MATERIAL BASED ON PMMA**

Natalya S. Dyuryagina¹, A. P. Yalovets^{1,2}

¹South-Ural State University (NRU), Chelyabinsk, Russia

²Chelyabinsk State University, Chelyabinsk, Russia

NUMERICAL SIMULATION OF SOLUTION REACTOR DYNAMICS AND DETERMINATION OF STRESS-STRAIN STATE OF ITS VESSEL

Nikolay V. Lopukhov

Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia

6-49 **ABOUT ONE LAGRANGIAN-EULERIAN METHOD FOR CALCULATING UNSTEADY FLOWS OF COMPRESSIBLE MEDIA**

Elena S. Shestakovskaya¹, F. G. Magazov¹, I. R. Makeeva^{1,2}

¹South Ural State University (National Research University), Chelyabinsk, Russia

²Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics,

Snezhinsk, Russia





SECTION 6

Section 6P NUMERICAL METHODS, ALGORITHMS, CODES AND ACCURATE SOLUTIONS

SEPTEMBER 30, THURSDAY 14³⁰ ДО 18⁰⁰
OCTOBER 1, FRIDAY C 8⁴⁰ ДО 13⁰⁰

Foyer

Posters

- 6-5 **A COUNTEREXAMPLE TO A GAS-DYNAMIC HYPOTHESIS**
Sergey P. Bautin
Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
- 6-25 **CONSTRUCTION OF DESCENDING SWIRLING VORTICES IN THE VICINITY OF THE OUTER BOUNDARIES OF THE CYCLONE**
 Alexey V. Mezentsev, S. L. Deryabin
Ural State University of Railway Transport, Yekaterinburg, Russia
- 6-26 **SIMULATION OF COMBUSTION OF REACTIVE GAS SUSPENSIONS DURING FLOW SWIRLING**
 Kseniya M. Moiseeva, A. Yu. Krainov
Tomsk State University, Tomsk, Russia
- 6-39 **ALGORITHM OF RETROSPECTIVE ANALYSIS OF TERRAIN USING DEEP LEARNING TECHNOLOGY**
Nikita A. Teplykh^{1,2}, A. L. Karmanov¹, V. V. Vlasov¹, V. V. Fyodorov^{1,2}
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²Snezhinsk Institute of Physics and Technology National Research Nuclear University “MEPhI”, Snezhinsk, Russia
- 6-28 **SIMULATION OF IRON MICROPARTICLE HEATING AND MELTING UNDER INTENSIVE HIGH-TEMPERATURE IMPACTS**
Artyom M. Mustafin, S. N. Lebedev, N. N. Pashentseva
Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-30 **VOXEL REPRESENTATION ALGORITHMS OF SCIENTIFIC DATA**
Vitaly S. Natynchik, A. V. Klimov
Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 6-10 **USE OF NONLOCAL DISCRETE METHODS OF COMPUTATIONAL MODELLING TO NUMERICALLY SOLVE OF CONTINUUM MECHANICS PROBLEMS**
 Maxim V. Vetchinnikov, M. A. Dyomina, N. S. Samsonova, V. N. Sofronov
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia
- 6-22 **THE LEGAK COMPUTATION METHOD FOR 3D NONSTATIONARY FLOWS OF MULTI-COMPONENT CONTINUUM USING SPECIAL TYPE OF BLOCK-STRUCTURED MESH**
 Sergey A. Krayukhin, N. A. Volodina, A. O. Naumov, S. V. Starodubov, T. V. Rezvova, K. V. Tsiberev, M. O. Shirshova, E. V. Shuvalova
Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia

6-31 **ABOUT ONE TYPE OF TENSOR ARTIFICIAL VISCOSITY FOR SIMULATION OF 3D GAS DYNAMIC FLOWS**



Andrey O. Naumov

Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia

6-11 **THERMAL EXPLOSION OF EXPLOSIVES ON THE OCTOGEN BASIS USING MULTISTAGE KINETICS OF THERMAL DECOMPOSITION**



Andrey Yu. Vishnyakov, A. A. Kabaev, V. A. Glazunov, S. A. Kabaev

Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Sarov, Russia

6-24 **ASSIMILATION OF ALTIMETRY DATA IN TO THE OCEAN CIRCULATION MODEL NEMO**

Andrey A. Kuleshov², K. P. Belyaev¹, I. N. Smirnov³

¹Shirshov Institute of Oceanology of Russian Academy of Sciences, Moscow, Russia

²Keldysh Institute of Applied Mathematics, Russian Academy of Science, Russia, Moscow,

³Lomonosov Moscow State University, Faculty of Computational Mathematics and Cybernetics, Moscow, Russia

6-35 **THE SOLUTION OF THE NEUTRON MULTI-GROUP TRANSPORT EQUATION IN SPHERICAL COORDINATES ON 2D UNSTRUCTURED MESHES**

Tatyana V. Ponomaryova, E. M. Vaziev, A. D. Gadzhiev

Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia

Section 7 APPLICATION OF PHYSICO-MATHEMATICAL TECHNOLOGIES TO SOLVING BASIC MEDICAL PROBLEMS

SEPTEMBER 30, THURSDAY

Morning session

Hall 2



Co-chairs: Sergey N. Lebedev
Grigoriy D. Kaminskiy

Presentations

- 7-11 9⁰⁰ **NOVEL MATHEMATICAL EPIDEMIOLOGY FROM PERSPECTIVE OF INTERNIST**
Grigoriy D. Kaminskiy
National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia
- 7-8 9³⁰ **A COVID-19 AGENT-BASED MODEL**
Oleg V. Zatsepin¹, A. A. Bragin¹, V. V. Vlasov¹, A. M. Deryabin¹, G. D. Kaminsky², E. V. Karamov^{2,3}, A. L. Karmanov¹, S. N. Lebedev¹, G. N. Rykovanov¹, S. I. Samarin¹, A. V. Sokolov¹, N. A. Solomin¹, N. A. Teplykh¹, A. S. Turgyev^{2,3}, M. S. Urakov¹, K. E. Khatuntsev¹
¹Russian Federal Nuclear Center – Zababakhin All-Russia Scientific Research Institute of Technical Physics, Snezhinsk, Russia
²National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia
³The National Research Center for Epidemiology and Microbiology named after Honorary Academician N. F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia
- 7-1 9⁵⁵ **MATHEMATICAL MODELS IN EPIDEMIOLOGY: SOLVING PRACTICAL PROBLEMS IN EPIDEMIOLOGY OF TUBERCULOSIS**
Konstantin K. Avilov
Marchuk Institute of Numerical Mathematics of the Russian Academy of Sciences, Moscow, Russia
- 7-32 10²⁰ **MODELING OF ACUTE AND CHRONIC VIRAL INFECTIONS**
Valeriya V. Chernetsova¹, E. V. Karamov^{2,3}, M. Y. Prostov⁴, Y. I. Prostov⁵, D. A. Semyonova², A. S. Turgiev^{2,3}, G. D. Kaminskiy²
¹Federal State Budgetary Educational Institution of Higher Education «National Research University “MEI”», Moscow, Russia
²Federal State Budgetary Institution “National Medical Research Center of Phthisiopulmonology and Infectious Diseases” of the Ministry of Health of the Russian Federation, Moscow, Russia
³Federal State Budgetary Institution “The National Research Center for Epidemiology and Microbiology named after Honorary Academician N. F. Gamaleya” of the Ministry of Health of the Russian Federation, Moscow, Russia
⁴ZAO “RY-Systems”, Moscow, Russia
⁵State Budgetary Institution “Research Institute for Healthcare and Medical Management of Moscow Healthcare Department”, Moscow, Russia
- 10⁴⁵ *Coffee-break*

Co-chairs: Oleg V. Zatsepin

Konstantin K. Avilov

- 7-24 11¹⁵ **POPULATION DYNAMICS OF MENTAL DISORDERS. VARIABLES, PROCESSES, SCENARIOS**
Alexey A. Romanyukha
Marchuk Institute of Numerical Mathematics of the Russian Academy of Sciences, Moscow, Russia
- 7-29 11⁴⁰ **MODELING OF RECURRENT EPIDEMICS**
Diana A. Semyonova
National Medical Research Center of Phthisiopulmonology
and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia
- 7-16 12⁰⁰ **A SYSTEMIC APPROACH TO THE STUDY OF MULTI-PARAMETER MODELS OF THE COVID-19 SPREAD**
 Oksana I. Zakharova, S. P. Levashkin
Artificial Intelligence Lab, Povolzhskiy State University of Telecommunications and Informatics,
Samara, Russia
- 7-3 12²⁰ **CIR MATHEMATICAL MODEL OF THE COVID-19 EPIDEMIC SPREAD**
 Yuliya E. Balykina, V. V. Zakharov
Saint Petersburg State University, Saint Petersburg, Russia
- 7-2 12⁴⁰ **SOME ASPECTS OF OBTAINING DATA FOR A MULTI-AGENT MODEL OF THE SPREAD OF INFECTIOUS DISEASES**
Viktor I. Baluta
Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Moscow, Russia
- 13⁰⁰ *Lunch*

SECTION 7

Section 7 **APPLICATION OF PHYSICO-MATHEMATICAL TECHNOLOGIES TO SOLVING BASIC MEDICAL PROBLEMS**

OCTOBER 1, FRIDAY

Morning session






Hall 2

Co-chairs:

Presentations

- 7-30 9⁰⁰ **MAKING A FORECAST OF THE DEVELOPMENT OF THE EPIDEMIOLOGICAL SITUATION IN THE PESTHOLE OF THE SPREAD OF VIRAL INFECTION THROUGH THE DAILY SOCIAL CONTACTS OF RESIDENTS**
Alexander V. Taranik, S. N. Lebedev, I. A. Litvinenko, G. V. Bajdin, O. N. Pavlenko, M. G. Belova, E. V. Besova
Russian Federal Nuclear Center – Zababakhin All-Russia
Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 7-17 9²⁵ **EMPIRICAL MODELING OF SOCIETY ACTIVITY IN THE CONTEXT OF THE COVID-19 PANDEMIC: BUILDING A PREDICTIVE MODEL**
Evgeny M. Loskutov, A. F. Seleznyov, V. V. Vdovin, D. N. Mukhin, A. S. Gavrilov, A. M. Feigin
Federal research center Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS), Nizhny Novgorod, Russia
- 7-18 9⁴⁵ **EMPIRICAL MODELING OF SOCIETY ACTIVITY IN THE CONTEXT OF THE COVID-19 PANDEMIC: SELECTION OF DYNAMICAL VARIABLES AND FORCING**
Dmitry N. Mukhin, A. F. Seleznev, V. V. Vdovin, E. M. Loskutov, A. S. Gavrilov, A. M. Feigin
Federal research center Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS), Nizhny Novgorod, Russia
- 7-20 10⁰⁵ **CONVERGENCE OF THE INTEGRAL AND DIFFERENTIAL EPIDEMIC MODELS WITH UNIFORM CONTAGION PROFILE**
Mikhail Y. Prostvov¹, D. A. Semyonova², V. V. Chernetsova³, G. D. Kaminskiy²
¹ZAO “RY-Systems”, Moscow, Russia
²National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia
³National Research University “MEI”, Moscow, Russia
- 7-33 10²⁵ **INVERSE PROBLEMS OF ACOUSTIC TOMOGRAPHY IN MEDICINE: THEORY AND ALGORITHMS**
Maxim A. Shishlenin^{1,2}, N. S. Novikov^{1,2}, S. I. Kabanikhin^{1,2}
¹Institute of Computational Mathematics and Mathematical Geophysics, Novosibirsk, Russia
²Novosibirsk State University, Novosibirsk, Russia
- 10⁴⁵ *Coffee-break*

Co-chairs: Boris K. Vodolaga,
Vladimir P. Osipov

- 7-9 11¹⁵ **THE MODELING OF HEALTHCARE SYSTEM ON THE EPIDEMY PROPAGATION**
 Alexander A. Zvekov, A. V. Kalenskii, A. S. Zverev, M. V. Anan'eva,
E. S. Pomesyachnaya
Kemerovo State University, Kemerovo, Russia
- 7-27 11³⁵ **POSSIBILITIES OF REPEATED RADIOTHERAPY IN THE TREATMENT OF PATIENTS WITH RECURRENT LOW-GRADE GLIOMA**
 Marina M. Sarycheva^{1,2}, R. Yu. Karabut¹, E. Ya. Mozerova^{1,2}, A. A. Lozhkov¹,
D. M. Timokhina¹, A. Yu. Maksimovskaya¹, Zh. E. Sabelnikova¹, D. A. Rogachyova¹
¹GBUZ “Chelyabinsk Regional Clinical Center of Oncology and Nuclear Medicine”, Chelyabinsk, Russia
²FGBU “South Ural State Medical University”, Chelyabinsk, Russia
- 5-2 11⁵⁵ **⁸⁹Zr AND ¹⁷⁷Lu LABELED MONOCLONAL ANTIBODIES FOR CANCER TARGETING PET IMAGING AND RADIOTHERAPY**
 Xia Yang^{1,2,3}, Jing Wang^{1,2,3}, Peng Zhao¹, Liangang Zhuo¹, Wei Liao¹, Yan Zhao³, Yuchuan Yang¹,
Shuming Peng¹
¹Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang, PR China
²Collaborative Innovation Center of Radiation Medicine of Jiangsu, Higher Education Institutions, Suzhou, PR China
³Key Laboratory of Nuclear Medicine and Molecular Imaging of Sichuan Province, Mianyang, PR China
- 7-26 12¹⁵ **PERFORMANCE EVALUATION OF STEREOTACTIC RADIATION THERAPY IN KIDNEY CANCER**
 Zhanna E. Sabelnikova, M. M. Sarycheva, I. A. Vazhenin, E. Ya. Mozerova,
A. T. Zhumbaeva
State budgetary institution of health care «Chelyabinsk regional clinical center of Oncology and nuclear medicine», Chelyabinsk, Russia
- 7-23 12³⁵ **MODERN METHODS OF TREATMENT OF PATIENTS WITH SINGLE METASTASES OF COLORECTAL CANCER TO THE LIVER**
 Darya A. Rogacheva, M. M. Sarycheva, E. Ya. Moserova, A. A. Lozhkov,
D. M. Timokhina, R. Yu. Karabut, A. Yu. Maksimovskaya, Zh. E. Sabelnikova
GBUZ “Chelyabinsk Regional Clinical Center of Oncology and Nuclear Medicine”, Chelyabinsk, Russia
- 13⁰⁰ *Lunch*

SECTION 7

Section 7P APPLICATION OF PHYSICO-MATHEMATICAL TECHNOLOGIES TO SOLVING BASIC MEDICAL PROBLEMS

SEPTEMBER 30, THURSDAY 14³⁰ TO 18⁰⁰
OCTOBER 1, FRIDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

7-4 **COLLECTING AND PROCESSING TECHNOLOGY OF UNSTRUCTURED DATA FROM THE INTERNET**

Sergey S. Varykhanov, A. A. Karandeev

Keldysh Institute of Applied Mathematics of Russian Academy of Sciences, Moscow, Russia

7-5 **THE FORMULA OF THE EPIDEMIC PROCESS OF HIV INFECTION**



Elena I. Veselova¹, E. V. Karamov^{1,2}, Y. I. Prostov³, D. A. Semenova¹, A. S. Turgiev^{1,2}, G. D. Kaminskiy¹

¹National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia

²The National Research Center for Epidemiology and Microbiology named after Honorary Academician N. F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia

³Research Institute for Healthcare and Medical Management of Moscow Healthcare Department, Moscow, Russia

7-6 **CONCEPT OF AUTOMATIC SEARCH OF SUBJECT INFORMATION IN THE INTERNET**

Vitaly V. Vlasov

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

7-7 **POPULATION TRANSFER IN AN AGENT-BASED VIRAL EPIDEMIC MODEL**

Alexander M. Deryabin, A. A. Bragin, V. V. Vlasov, O. V. Zatsepin, A. L. Karmanov, S. N. Lebedev, G. N. Rykovanov, S. I. Samarin, A. V. Sokolov, N. A. Solomin, N. A. Teplykh, M. S. Urakov, K. E. Khatuntsev

Russian Federal Nuclear Center – Zababakhin All-Russia

Scientific Research Institute of Technical Physics, Snezhinsk, Russia

7-10 **SIMULATION OF A CLONE EXPLOSION IN A CONTINUOUS EPIDEMIC MODEL**

Grigory D. Kaminskiy

National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia



7-12 **CONTROL OF THE EPIDEMIC PROCESS OF HIV INFECTION**

Grigory D. Kaminskiy¹, E. I. Veselova¹, E. V. Karamov^{1,2}, Y. I. Prostov³, A. S. Turgiev^{1,2}, D. A. Semyonova¹

¹National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health of the Russian Federation, Moscow, Russia

²The National Research Center for Epidemiology and Microbiology named after Honorary Academician N. F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia

³Research Institute for Healthcare and Medical Management of Moscow Healthcare Department, Moscow, Russia

- 7-13 **SOME GEOPHYSICAL ASPECTS OF HUMAN ECOLOGY**
 Farshed H. Karimov
 Institute of Geology, Earthquake Engineering and Seismology National Academy of Sciences of Tajikistan,
 Dushanbe, Tajikistan
- 7-19 **THE AGENT MODEL OF OPINIONS AS A TOOL FOR DESCRIBING
 THE BEHAVIOR OF SOCIETY IN AN EPIDEMIC**
 Dmitry N. Mukhin, S. E. Safonov, A. Yu. Mukhina, E. M. Loskutov, A. M. Feigin
 Federal research center Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS),
 Nizhny Novgorod, Russia
- 7-14 **PLATFORM FOR AUTOMATION OF COLLECTION OF INFORMATION
 FROM OPEN SOURCES**
 Andrey L. Karmanov, V. V. Vlasov, N. A. Teplykh, V. N. Pervinenko
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 7-15 **OPTIMIZATION METHODS FOR INVERSE PROBLEMS IN EPIDEMIOLOGY
 (REVIEW)**
 Alexander B. Konovalov, V. V. Vlasov
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia
- 7-21 **CONVERGENCE OF THE INTEGRAL AND DIFFERENTIAL MODELS
 OF EPIDEMICS WITH AN EXPONENTIAL CONTAGION PROFILE**
 Mikhail Y. Prostov¹, D. A. Semyonova², G. D. Kaminskiy²
¹ZAO “RY-Systems”, Moscow, Russia
²National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health
 of the Russian Federation, Moscow, Russia
- 7-22 **THE STABILITY OF THE EPIDEMIC PROCESS**
 Yury I. Prostov¹, M. Y. Prostov², G. D. Kaminskiy³
¹State Budgetary Institution “Research Institute for Healthcare and Medical Management of Moscow
 Healthcare Department”, Moscow, Russia
²ZAO “RY-Systems”, Moscow, Russia
³Federal State Budgetary Institution “National Medical Research Center of Phthisiopulmonology and
 Infectious Diseases” of the Ministry of Health of the Russian Federation, Moscow, Russia
- 7-25 **A LOOK AT THE SYSTEMS OF QUASILINEAR CONSERVATION LAWS
 FROM THE POINT OF VIEW OF NEURAL NETWORK ALGORITHMS**
 Yury G. Rykov
 Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Moscow, Russia
- 7-28 **NONLINEAR EPIDEMIC PROCESS OF VIRAL INFECTIONS**
 Diana A. Semyonova¹, M. Y. Prostov², E. V. Karamov^{1,3}, A. S. Turgiev^{1,3}, G. D. Kaminskiy¹
¹National Medical Research Center of Phthisiopulmonology and Infectious Diseases of the Ministry of Health
 of the Russian Federation, Moscow, Russia
²ZAO “RY-Systems”, Moscow, Russia
³The National Research Center for Epidemiology and Microbiology named after Honorary Academician
 N. F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia
- 7-31 **EPIDEMIC PROCESS IN A SMALL COMPANY**
 Andrey L. Falkov
 Russian Federal Nuclear Center – Zababakhin All-Russia
 Scientific Research Institute of Technical Physics, Snezhinsk, Russia

FINAL SESSION

FINAL SESSION

OCTOBER 1, FRIDAY

Afternoon session

Hall 1

Chairman: Vadim A. Simonenko

14³⁰ **GENERAL DISCUSSION**
SPEECHES OF SESSION CHAIRMEN
SUMMARIZING