

Section 3 DENSE PLASMA PHENOMENA

MAY 21, WEDNESDAY

Morning session

Hall 2

Co-chairs: Andrey P. Kuznetsov,
Semyon I. Glazyrin

Presentations

- 3-21 9⁰⁰ **EXPERIMENTAL LASER FACILITY “ELF”. PROJECT STATUS**
Andrey P. Kuznetsov¹, V. N. Derkach², S. G. Garanin², A. V. Lobanov¹,
V. V. Kravchenko¹, A. V. Mikhaylyuk¹, A. P. Melekhov¹, A. E. Kadyrov¹, N. I. Karpov¹,
M. S. Tsarev¹, D. A. Deshin¹, M. S. Dudalin¹, K. I. Volkov¹, G. A. Kazartsev¹,
V. I. Samoylov¹, D. E. Radygin¹, U. M. Abakumov¹, M. A. Kulikov¹,
M. V. Degtyarev¹, E. R. Ryndyk¹
¹National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia
²FSUE «RFNC – VNIIEF», Sarov, Russia
- 3-22 9²⁰ **MULTICHANNEL YB:YAG LASER WITH HIGH AVERAGE AND PEAK POWER**
Ivan I. Kuznetsov, S. A. Chizhov, D. S. Trunov, N. I. Karpov, O. V. Palashov
A. V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny
Novgorod, Russia
- 3-29 9⁴⁰ **RESEARCH AND DEVELOPMENT OF THE ELECTRON
AND ION ACCELERATORS AT NRNU MEPhI
FOR RESEARCH AND APPLICATIONS**
Sergey M. Polozov
National research nuclear university MEPhI, Moscow, Russia
- 3-1 10⁰⁰ **UNDERSTANDING RADIATION TRANSPORT IN STOCHASTIC MIXTURES**
 Cong-Zhang Gao
Institute of Applied Physics and Computational Mathematics, Beijing, China
- 3-41 10³⁰ **THE 3D ANALYTICAL CALCULATIONS OF THERMAL RADIATION FIELD
IN SPHERICAL BOX WITH CIRCULAR CONVERTERS HEATING UP
FROM OUTSIDE BY LASER BEAMS OF MEGAJOULE FACILITY**
Ivan A. Khimich, V. A. Lykov, G. N. Rykovanov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 10⁴⁵ *Coffee-break*
- 3-9 11¹⁵ **EXPERIMENTAL SETUP TO STUDY THE EFFECT OF NONLOCAL THERMAL
TRANSPORT IN PLASMA**
Semyon I. Glazyrin^{1, 2}, A. V. Brantov^{2, 1}, S. A. Karpov¹,
V. Yu. Bychenkov^{2, 1}, D. S. Shidlovskiy¹
¹Dukhov Research Institute of Automatics, Moscow, Russia
²Lebedev Physics Institute, Russian Academy of Sciences, Moscow, Russia
- 3-8 11³⁰ **EXPERIMENTAL SETUP TO STUDY THE EFFECT OF RADIATION TRANSFER
ON THE DEVELOPMENT OF HYDRODYNAMIC INSTABILITIES**
Semyon I. Glazyrin, D. S. Shidlovskiy
Dukhov Research Institute of Automatics, Moscow, Russia

- 3-39 11⁴⁵ **CHANGE OF RATES OF THERMONUCLEAR REACTIONS IN PLASMA WITH IONIC CORRELATIONS. TECHNICAL AND ASTROPHYSICAL CONSEQUENCES**
Andrey L. Falkov, A. A. Ovechkin, V. A. Lykov, P. E. Kiskin,
D. A. Varfolomeev, N. M. Zhdanova
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-2 12⁰⁰ **FUSION IGNITION IN INDIRECT-DRIVE TARGETS UNDER THE CONDITIONS OF SPHERICALLY INJECTED SECOND-HARMONIC LASER LIGHT**
Maxim S. Averin, A. S. Gnutov, I. Y. Ermakova, A. A. Busalov,
K. A. Volkova, O. E. Vlasova
FSUE «RFNC – VNIIEF», Sarov, Russia
- 12¹⁵ **DETAILS OF NUMERICAL SIMULATIONS OF FUSION IGNITION EXPERIMENTS ON THE NIF LASER FACILITY**
Maxim S. Averin, A. S. Gnutov, E. S. Tsoy, I. Y. Ermakova, N. A. Vershinina,
V. J. Rezchikov, A. A. Busalov, J. V. Morenlo, O. E. Vlasova
FSUE «RFNC – VNIIEF», Sarov, Russia
- 3-42 12³⁰ **LOW-DENSITY POROUS MATERIALS: PRODUCTION AND USE IN LASER TARGETS**
Anna V. Tsareva, A. V. Ilyushechkina, S. M. Prohorov, E. Yu. Solomatina, I. A. Chugrov
FSUE «RFNC – VNIIEF», Sarov, Russia
- 5-5 12⁴⁵ **OPTIMIZATION AND MANUFACTURING OF ACCELERATING STRUCTURE OF THE LINEAR ELECTRON ACCELERATOR FOR APPLIED RESEARCH**
Andrey A. Batov, R. A. Zbruev, T. V. Bondarenko, M. V. Vladimirov,
S. M. Polozov, M. V. Lalayan
National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia
- 13⁰⁰ *Lunch*

Afternoon session

Hall 3

Co-chairs: Evgeny A. Govras,
Sergey N. Ryazantsev

- 3-16 14³⁰ **FROM LOW-INTENSITY EXPOSURES FOR PHOTONICS AND OPTOACOUSTICS TO INTENSE ULTRASHORT HARD X-RAYS**
Hail A. Inogamov
FSUE Dukhov Automatics Research Institute (VNIIA), Moscow, Russia
Landau institute for theoretical physics RAS, Chernogolovka, Russia
Joint institute for high temperatures RAS, Moscow, Russia
- 3-14 14⁵⁰ **KINETICS OF ULTRARELATIVISTIC PLASMA**
Alexey G. Zhidkov
National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia

- 3-36 15¹⁰ **LASER-DRIVEN PROTON ACCELERATION AT TARGET IRRADIATION WITH LONG-FOCUS PARABOLIC MIRROR**
Konstantin V. Safronov, A. A. Bushukhin, S. A. Gorokhov, V. A. Flegentov, N. N. Shamaeva, D. I. Bashkin, I. N. Shishkov, D. O. Zamuraev, A. L. Shamraev, S. F. Kovaleva, N. A. Fedorov, A. V. Potapov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-40 15²⁵ **FIRST EXPERIMENTS ON LASER RADIOGRAPHY FACILITY, BASED ON 100 TW PICOSECOND LASER AND LIGHT-GAS GUN**
Vladimir A. Flegentov, K. V. Safronov, S. A. Gorokhov, I. N. Shishkov, N. N. Shamaeva, A. A. Bushukhin, E. S. Borisov, D. S. Gavrilov, E. A. Loboda, N. Yu. Titarenko, A. S. Tischenko, H. A. Pkhaiko, D. N. Kazakov, S. N. Malyugina, E. A. Govras, V. A. Potapov, A. G. Kakshin, A. V. Pavlenko
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-35 15⁴⁰ **X-RAY SPECTROSCOPY DIAGNOSTICS OF DENSE FEMTOSECOND LASER PLASMA**
Sergey N. Ryazantsev
Joint Institute for High Temperatures of the Russian Academy of Sciences (JIHT RAS), Moscow, Russia
- 16⁰⁰ *Coffee-break*
- 3-43 16³⁰ **GENERATION OF TERAHERTZ RADIATION PULSES WITH HIGH ELECTRIC FIELD STRENGTH AND THEIR APPLICATION IN STUDIES OF RADIATION-MATTER INTERACTION**
Oleg V. Chefonov, A. V. Ovchinnikov
Joint Institute for High Temperatures of Russian Academy of Sciences (JIHT RAS), Moscow, Russia
- 3-33 16⁴⁵ **ON THE ROLE OF NONLINEARITY IN COMPTON EFFECT IN NARROWBAND GAMMA-RAY SOURCES**
Sergey G. Rykovanov^{1, 2}, A. D. Timoshenko^{1, 2}, M. P. Malakhov^{2, 3}, A. M. Fedotov^{2, 3}, I. Yu. Kostyukov^{2, 4}
¹Skolkovo Institute of Science and Technology, Moscow, Russia
²Institute of Applied Physics RAS, Nizhny Novgorod, Russia
³National Research Nuclear University “MEPHI”, Moscow, Russia
⁴Lobachevski Nizhny Novgorod State University, Nizhny Novgorod, Russia
- 3-19 17⁰⁰ **PLASMA-MIRROR-BASED LASER PULSE CONTRAST ENHANCEMENT SYSTEM FOR MULTITERAWATT LASER FACILITY**
Sof’ya F. Kovaleva, N. A. Fedorov, D. O. Zamuraev, A. S. Tischenko, A. L. Shamraev, K. V. Safronov, V. A. Flegentov, A. V. Potapov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-4 17¹⁵ **LASER-DRIVEN ACCELERATION OF LOW DIVERGENCE PROTON BEAMS**
Alexey A. Bushukhin, K. V. Safronov, S. A. Gorokhov, V. A. Flegentov, N. N. Shamaeva, D. O. Zamuraev, A. L. Shamraev, S. F. Kovaleva, N. A. Fedorov, A. V. Potapov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-46 17³⁰ **MEASUREMENTS OF HIGH-ENERGY PART (7–20 MeV) OF BREMSSTRAHLUNG SPECTRA USING PHOTONUCLEAR REACTIONS**
Igor N. Shishkov, V. A. Flegentov, K. V. Safronov, E. S. Borisov, I. V. Penzin, K. S. Volosenko, O. V. Zatsepin, A. V. Potapov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia

- 3-24 17⁴⁵ **LASER-DRIVEN ELECTRON ACCELERATION: “LASER BULLET”
OR “LASER BUBBLE”?**
Maxim G. Lobok^{1,2}, V. Yu. Bychenkov^{1,2}, A. J. Castillo¹, S. G. Bochkarev^{1,2}
¹P. N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia
²All-Russia Research Institute of Automatics named after N. L. Dukhov, Moscow, Russia
- 3-5 18⁰⁰ **OPTIMIZATION OF SYNCHROTRON RADIATION IN THE CASE
OF LASER PULSE PROPAGATION IN THE RELATIVISTIC
SELF-TRAPPING REGIME**
Olga E. Vais, M. G. Lobok, V. Yu. Bychenkov
N. L. Dukhov All-Russian Research Institute of Automation, Moscow, Russia
P. N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

Section 3 **DENSE PLASMA PHENOMENA**

MAY 22, THURSDAY

Afternoon session

Hall 2

Co-chairs: Peter A. Loboda,
Sergey S. Makarov

Presentations

- 3-23 14³⁰ **THEORETICAL MODELING OF THERMOPHYSICAL PROPERTIES
AND LINE RADIATION SPECTRA OF DENSE IONIZED MATTER**
Peter A. Loboda, A. A. Ovechkin, A. L. Falkov, A. S. Korolev, A. Yu. Letunov,
A. A. Novikov, N. G. Karlykhanov, P. A. Sapozhnikov,
S. V. Kolchugin, and M. E. Berezovskaya
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-17 14⁵⁰ **ANOMALOUS THERMODYNAMICS OF ENTROPIC PHASE TRANSITIONS
IN DENSE NON-IDEAL PLASMAS**
 Igor L. Iosilevskiy^{1,2}, V. K. Gryaznov³, A. V. Shutov³
¹Joint Institute for High Temperatures RAS, Moscow, Russia,
²Moscow Institute of Physics and Technology, Dolgoprudny, Moscow, Russia,
³FRG of Problems of Chemical Physics and MC RAS, Chernogolovka, Russia
- 3-27 15¹⁰ **CALCULATIONS OF ELECTRON-ION COUPLING FACTORS
USING THE STARRETT AND SAUMON AVERAGE-ATOM MODEL**
Anton A. Ovechkin, N. A. Smirnov, P. A. Loboda, A. L. Fal'kov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-34 15²⁵ **THERMODYNAMIC PROPERTIES OF ALUMINUM OXIDE
FROM DENSITY FUNCTIONAL THEORY-BASED CALCULATIONS**
Alexey A. Rykounov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-26 15⁴⁰ **STUDY OF EXTREME HYDRODYNAMIC PHENOMENA IN LASER PLASMA
BY HIGH-RESOLUTION COHERENT X-RAY RADIOGRAPHY:
POSSIBILITIES AND LIMITATIONS**
Sergey S. Makarov
Joint Institute for High Temperatures, Russian Academy of Sciences, Moscow, Russia
National Research Center “Kurchatov Institute”, Moscow, Russia
- 16⁰⁰ *Coffee-break*
- 3-37 16²⁰ **THE ELECTRONIC STRUCTURE, LATTICE DYNAMICS,
AND ELECTRON-PHONON COUPLING FACTOR OF METALS
UNDER NON-EQUILIBRIUM HEATING**
Nikolay A. Smirnov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia

- 3-12 16³⁵ **MOLECULAR DYNAMICS SIMULATION OF NON-DEGENERATE HYDROGEN PLASMA USING A MODIFIED KELBG PSEUDOPOTENTIAL WITH LONG-RANGE INTERACTIONS**
Georgy S. Demyanov, A. S. Onegin, P. R. Levashov
Joint Institute for High Temperatures, Moscow, Russia
Moscow Institute of Physics and Technology, Dolgoprudny, Russia
- 3-47 16⁵⁰ **INVESTIGATION OF NOBLE METALS PROPERTIES IN THE NEAR-CRITICAL REGION USING THE CHEMICAL MODEL “3+”**
Alexey S. Shumikhin
Joint Institute for high temperatures of RAS, Moscow, Russia
- Co-chairs: Evgeny D. Vovchenko
- 3-6 17⁰⁵ **CORPUSCULAR DIAGNOSTICS OF HIGH-CURRENT NANOSECOND DISCHARGE OF THE LOW-INDUCTANCE VACUUM SPARK TYPE WITH LASER INITIATION**
Evgeny D. Vovchenko, K. I. Kozlovskij, A. E. Shikanov, E. A. Morozova, N. I. Karpov, A. M. Alyokhin
National Research Nuclear University MEPhI, Moscow, Russia
- 3-32 17²⁰ **PULSED RADIATION-MAGNETOGASDYNAMIC SCHEMES FOR HIGH-POWER ELECTROPHYSICAL AND POWER PLANTS**
Sergey V. Ryzhkov, A. G. Polyanskiy
Bauman Moscow State Technical University, Moscow, Russia
- 3-38 17³⁵ **INVESTIGATION OF ELECTRIC EXPLOSION OF THIN FLAT FOILS BY NANOSECOND CURRENT PULSE**
Ivan N. Tilikin, T. A. Shelkovenko, S. A. Pikuz, A. P. Mingaleev, V. M. Romanova
P. N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia
- 3-15 17⁵⁰ **MAXWELL DISPLACEMENT CURRENTS IN FIELD THEORY AND IN PRACTICAL APPLICATIONS**
Mikhail Ya. Ivanov
FAU CIAM named after P. I. Baranov, Moscow
- 3-20 18⁰⁵ **OVERHEATING INSTABILITY FOR AN HF ARC DISCHARGE IN AIR AT ELEVATED PRESSURES**
Anatoly F. Kokorin, A. A. Popov
Yeltsin Ural Federal University, Ekaterinburg, Russia

Section 3P DENSE PLASMA PHENOMENA

MAY 21, WEDNESDAY 14³⁰ TO 18⁰⁰
MAY 22, THURSDAY 8⁴⁰ TO 13⁰⁰

Foyer

Posters

- 3-7 **INTERACTION OF FEMTOSECOND LASER RADIATION WITH GOLD FOIL: MOLECULAR DYNAMICS SIMULATION**
Marina A. Vorobyova, N. A. Smirnov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-10 **MEASURING THE PARAMETERS OF RELATIVISTIC ELECTRON BEAMS ACCELERATED FROM THIN SOLID TARGETS BY FEMTOSECOND LASER PULSES OF 100 TW POWER**
Sergey A. Gorokhov, V. A. Flegentov, K. V. Safronov, S. F. Kovaleva, N. A. Fedorov, D. O. Zamuraev, A. L. Shamraev, A. S. Tischenko, A. V. Potapov
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-13 **EXPERIMENTAL STUDY OF LASER CONTRAST EFFECT ON X-RAY PULSE DURATION**
Andrey V. Emelyanov, D. A. Vikhlyaev, S. D. Devyatkov, D. O. Zamuraev, D. S. Nosulenko, A. S. Tischenko, N. A. Fedorov, A. L. Shamraev
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-18 **INVESTIGATION INTO THE ELECTROMAGNETIC PULSE REFLECTIVITY AND TRANSMITTANCE THROUGH A LOW-DENSITY COPPER COATING**
Alexander G. Kazakov, A. V. Potapov, N. A. Pkhayko, E. M. Pisarev, A. A. Kondratiev, I. A. Sorokin, Yu. L. Lyzhina
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-28 **MANUFACTURING OF LASER TARGETS BASED ON LOW-DENSITY (10 mg/cm³) CARBON FOAM**
Evgeny M. Pisarev, N. A. Phaiko, S. A. Lekomtsev
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-30 **COMPARATIVE MODELING OF BREMSSTRAHLUNG GENERATION BY A HIGH-ENERGY ELECTRON BEAM**
Daniil V. Popov^{1,2}, K. E. Khatuntsev², E. A. Govras², O. V. Zatsepin²
¹National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia
²FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-31 **FABRICATION OF LASER TARGETS TO STUDY THE RAYLEIGH-TAYLOR HYDRODYNAMIC INSTABILITY**
Nikolay A. Pkhayko, E. M. Pisarev, L. E. Guss, A. V. Saveliev, A. G. Kazakov, V. A. Golunov, Yu. L. Lyzhina
FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia
- 3-11 **ENRICHMENT OF AEROLITH FUSION CRUST WITH PLATINUM-GROUP METALS DURING ABLATION**
Viktor I. Grokhovsky¹, V. V. Sharygin², G. A. Yakovlev¹
¹Ural Federal University, Ekaterinburg, Russia
²Institute of Geology and Mineralogy SB RAS, Novosibirsk, Russia

**3-45 COMPARATIVE ANALYSIS OF CHARACTERISTICS OF THE DETECTORS IMAGE
PLATE AND NEEDLE IMAGE PLATE WHEN RECORDING IMAGES
IN X-RAY RADIATION FROM LASER PLASMA SOURCE**

Natal'ya N. Shamaeva, K. V. Safronov, V. A. Flegentov, A. A. Bushukhin, I. N. Shishkov, A. V. Potapov
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