



**GDP
2025**

SEPTEMBER 08 - 12, 2025

EKATERINBURG

RUSSIA

ABSTRACTS BOOK

17TH International Conference
**GAS DISCHARGE PLASMAS
AND THEIR APPLICATIONS**



Institute of Electrophysics UB RAS, Russia
Institute of High Current Electronics SB RAS, Russia
Ural Branch of the Russian Academy of Sciences, Russia
Institute of Metallurgy UB RAS, Russia
Ural Federal University, Russia
Ufa University of Science and Technology, Russia
LLC "Signifika", Russia

**17th International Conference
“Gas Discharge Plasmas
and Their Applications”
GDP 2025**

Abstracts

September 8–12, 2025
Ekaterinburg, Russia

Ekaterinburg 2025

UDC 533.9
BBC 22.333.3

17th International Conference "Gas Discharge Plasmas and Their Applications" GDP 2025 (Ekaterinburg, September 8–12, 2025): Abstracts. – Ekaterinburg: IEP UB RAS, 2025. – 275 p.

Edited by Dr Nikolay Zubarev.

The book contains abstracts of oral and poster reports presented at the 17th International Conference "Gas Discharge Plasmas and Their Applications" (GDP 2025). This event is a continuation of conferences on gas discharge physics held in Russia since 1984, as well as seminars and conferences on the technological application of low-temperature plasma. The conference is held every 2 years in different cities of the Russian Federation. This year, the wonderful city of Ekaterinburg, located in the heart of the Urals on the border of Europe and Asia, was chosen as the venue. The program of the Conference covers a wide range of technical areas and modern aspects of the physical processes occurring in generators of low temperature plasma, low and high-pressure discharges, pulsed plasma sources, surface modification, and other gas-discharge technologies.

Science Edition

Published in author's version

© IEP UB RAS

CONTENTS

PLENARY REPORTS	23
DISCHARGE-EMISSION SYSTEMS UNDER EXTREME OPERATING CONDITIONS AND THEIR APPLICATION FOR MODIFICATION OF MATERIALS E.M. Oks	24
HIGH VOLTAGE SETUPS FOR RUNAWAY ELECTRON BEAM GENERATION IN THE INSTITUTE OF ELECTROPHYSICS UB RAS S.A. Shunailov, N.M. Zubarev, S.N. Rukin, L.N. Lobanov, M.R. Ulmaskulov, K.A. Sharypov, V.G. Shpak and M.I. Yalandin	25
PULSED DISCHARGES IN AEROSPACE APPLICATIONS A. Starikovskiy	26
PLASMA METHODS FOR CONTROLLING AERODYNAMIC FLOWS V.A. Yamshchikov, V.Yu. Khomich	27
GAS DISCHARGE PLASMA FOR SURFACE MODIFICATION OF INSULATING MATERIALS Cheng Zhang	28
ACTIVE BROWNIAN MOTION OF CHARGED GRAINS IN PLASMA, VISCOUS FLUID AND SUPERFLUID HELIUM O.F. Petrov	29
PHYSICAL MODELS OF COMPACT NEUTRON SOURCES UNDER THE ACTION OF LASER A.G. Polyanskiy, S.V. Ryzhkov	30
SECTION 1 FUNDAMENTAL PROCESSES IN LOW-TEMPERATURE PLASMA: low and high pressure discharges, near-electrode phenomena, radiation, ultrafast processes, diagnostics	31
SURFACE IONIZATION WAVES IN A COAXIAL BARRIER DISCHARGE IN ARGON FLOW AT ATMOSPHERIC PRESSURE Yu.S. Akishev, S.A. Ermolaeva, M.A. Medvedev, A.V. Petryakov	32
CHARACTERISTICS OF AN ARC DISCHARGE WITH AN INCANDESCENT AND A HOLLOW CATHODE I.I. Azhazha, V.V. Shugurov, Yu.Kh. Akhmadev	33
DETECTION OF RUNAWAY ELECTRODES IN RED SPRITE SIMULATIONS USING CAPACITIVE DISCHARGE PLASMA E.Kh. Baksht, V.F. Tarasenko, N.P. Vinogradov	34
TRICHEL PULSES AND THE PRECEDING STAGE IN A NEGATIVE CORONA DISCHARGE E.Kh. Baksht, V.F. Tarasenko	35

DIFFUSE VACUUM ARC ON NONTHERMIONIC CHROMIUM CATHODE IN AXIAL MAGNETIC FIELD A.I. Belostotskii A.D. Melnikov, M.S. Paramonov, R.A. Usmanov, N.N. Antonov, A.V. Gavrikov, V.P. Smirnov	36
DYNAMICS OF ELECTROPHYSICAL AND THERMOMECHANICAL PROCESSES DURING ELECTRICAL EXPLOSION OF CONDUCTORS IN SKIN MODE G.Sh. Boltachev, S.A. Chaikovsky	37
MEASUREMENTS OF PLASMA PROPERTIES IN ELECTRON BEAM TRANSPORT CHANNEL WITH BIPOLAR ION-OPTICAL SYSTEM A.S. Bugaev, V.I. Gushenets	38
PROTON BEAM TRANSPORT THROUGH A SPACE CHARGE (PLASMA) LENS A.S. Bugaev, V.I. Gushenets, U.V. Khomutova, V.P. Frolova, E.M. Oks	39
FEATURES OF MAGNETIC FIELD DIFFUSION DURING THE EXPLOSION OF FLAT PERFORATED CONDUCTORS I.M. Datsko, S.A. Chaikovsky, V.A. Van'kevich, N.A. Labetskaya, V.I. Oreshkin	40
THE SYSTEMS BASED ON HIGH-CURRENT NON-SELF-SUSTAINED LOW-PRESSURE GLOW DISCHARGE WITH A HOLLOW CATHODE FOR GENERATION OF BEAM- PLASMA FORMATIONS V.V. Denisov, T.V. Koval, N.N. Koval, E.V. Ostroverkhov, M.V. Savchuk, S.S. Kovalsky, V.V. Yakovlev, A.O. Egorov	41
ANALYSIS OF PLASMA DYNAMICS IN AN ALTERNATING CURRENT HYDROGEN PLASMA TORCH AT ATMOSPHERIC PRESSURE N.V. Obraztsov, A.A. Safronov, Yu.D. Dudnik, N.Y. Bykov, V.N. Shiryaev, A.V. Surov, O.B. Vasilieva	42
PATTERNS OF GENERATION OF EMISSION BEAM-PLASMA FORMATION IN A HOLLOW CATHODE OF A NON-SELF-SUSTAINED GLOW DISCHARGE A.O. Egorov, V.V. Denisov, S.S. Kovalsky, E.V. Ostroverkhov, V.V. Yakovlev, A.D. Teresov	43
NUMERICAL MODELING OF PLASMA FLOW IN ABLATIVE PULSED ACCELERATOR D.A. Egoshin, Y.M. Grishin, V.D. Telekh	44
BASES FOR APPLYING THE LTE MODEL TO EVALUATE THE STATE OF PLASMA IN AN ARCJET THRUSTER V.I. Gorbunkov	45
BREAKDOWN MECHANISMS MATCHING IN THE COMPOSITE PLASMA SWITCHER P.A. Bokhan, P.P. Gugin, M.A. Lavrukhin, D.E. Zakrevsky	46
ON THE ISSUE OF CURRENT DISTRIBUTION BETWEEN CATHODES IN A HIGH- CURRENT PENNING-TYPE DISCHARGE A.S. Bugaev, V.I. Gushenets, V.P. Frolova, E.M. Oks, K.A. Shcheglov	47
STUDY OF THE MASS-CHARGE ION BEAM COMPOSITION OF A VACUUM ARC PLASMA SOURCE USING THE ELECTROMAGNETIC METHOD A.S. Bugaev, V.I. Gushenets, E.M. Oks	48

INVESTIGATION OF THE REGULARITY OF PLASMA GENERATION INSIDE EXTENDED METAL CAVITIES FOR ION-PLASMA TREATMENT D.Yu. Ignatov	49
MECHANISM OF CONTRACTION OF SELF-SUSTAINED SUBNANOSECOND DISCHARGE S.N. Ivanov, V.V. Lisenkov	50
THE INFLUENCE OF RUNAWAY ELECTRONS ON THE ENERGY CHARACTERISTICS OF SELF-SUSTAINED SUBNANOSECOND DISCHARGE IN HYDROGEN S.N. Ivanov, V.V. Lisenkov	51
COMPUTATION OF HIGH ELECTRON DENSITY DURING NANOSECOND PULSED PLASMA SYNTHETIC JET DISCHARGE INITIATION: COUPLED NUMERICAL MODELS Jintao Zhang, Cheng Zhang, Xinyu Xu, Bangdou Huang, Tao Shao	52
COMPETING TYPES OF ELECTRON EMISSION IN A GRID PLASMA EMITTER BASED ON A LOW-PRESSURE ARC R.A. Kartavtsov, M.A. Mokeev, M.S. Vorobyov, A.A. Grishkov, N.N. Koval, S.Yu. Doroshkevich, P.V. Moskvina, D.A. Gorkovskaia	53
OPERATION FEATURES OF A PLANAR MAGNETRON DISCHARGE FORMING EMISSION PLASMA IN A PULSED FOREVACUUM PLASMA-CATHODE ELECTRON- BEAM SOURCE A.V. Kazakov, V.E. Arkatov, Y.A. Burachevsky, E.M. Oks, N.A. Panchenko	54
GENERATION AND ANALYSIS OF UNIPOLAR ARCS ON W FUZZ INITIATED UNDER HELIUM ION BOMBARDMENT FROM RF PLASMA A.V. Kaziev, G.I. Dobrovolskiy, D.V. Kolodko, K.V. Smirnova, A.V. Tumarkin, M.M. Kharkov, M.M. Tsventoukh	55
OBSERVATION OF THE TRANSIENT STAGES BETWEEN PULSED MAGNETRON DISCHARGE AND LOW-VOLTAGE MODES USING DIFFERENT POWER SUPPLIES A.V. Kaziev, N.S. Sazonov, D.V. Kolodko	56
PLASMA DIFFUSE JET IN DIELECTRIC TUBE AS THE LABORATORY ANALOGUE OF ATMOSPHERIC PHENOMENA A.O. Kokovin, A.V. Kozyrev, V.F. Tarasenko	57
EFFECT OF THE MAGNETIC FIELD ON THE STRUCTURE OF THE PENNING ION SOURCE DISCHARGE A.E. Kolobov, S.V. Syromukov	58
CALIBRATION OF LIDS RESULTS AGAINST ABSOLUTE PRESSURE MEASUREMENTS FOR REMOTE DIAGNOSTICS OF HYDROGEN RETENTION D.V. Kolodko, G.I. Rykunov, M.S. Grachev, A.V. Tumarkin, A.V. Kaziev, Yu.M. Gasparyan	59
NUMERICAL STUDY OF GEOMETRIC ERRORS IN QUARTER-SPHERICAL ENERGY ANALYZERS FOR PLASMA FLOW DIAGNOSTICS IN ELECTRODELESS THRUSTER D.V. Kolodko, A.S. Aksenova, M.S. Novikov, A.V. Tumarkin, M.M. Kharkov, A.V. Kaziev	60

FEATURES OF THE PARASITIC CURRENTS IN PSEUDOSPARK SWITCH FOR DIFFERENT METHODS OF THE SWITCH TRIGGERING Y.D. Korolev, N.V. Landl, O.B. Frants, V.G. Geyman, A.V. Bolotov, V.O. Nekhoroshev, M.S. Torba	61
SWITCHING PROCESS IN THE PSEUDOSPARK SWITCH AT DIFFERENT ELECTRIC CIRCUITS FOR TRIGGERING AND DIFFERENT DESIGNS OF THE TRIGGER UNIT Y.D. Korolev, N.V. Landl, O.B. Frants, V.G. Geyman, A.V. Bolotov, V.O. Nekhoroshev, S.S. Kovalsky, E.V. Ostroverkhov	62
SIMULATION OF PLASMA-BEAM FORMATION IN A HOLLOW CATHODE WITH METAL PLASMA GENERATORS T.V. Koval, D.D. Zaytsev, V.V. Denisov, M.V. Savchuk	63
SWITCHING CHARACTERISTICS OF SPARK DISCHARGES IN STATIC BREAKDOWN MODE AT PRESSURES OF 20-140 ATMOSPHERES B.A. Kozlov, D.S. Makhanko	64
NONLINEAR DIFFUSION OF A STRONG MAGNETIC FIELD IN A CONDUCTORS WITH SMALL TIMES OF ITS RAISE N.A. Labetskaya, S.A. Sorokin, I.M. Datsko, S.A. Chaikovsky, V.A. Vankevich, V.I. Oreshkin	65
FORMATION OF GAS-FILLED BUBBLES IN A SALINE SOLUTION AT A NEGATIVE POLARITY OF FLAT ACTIVE ELECTRODE N.V. Landl, A.V. Bolotov, Y.D. Korolev, O.B. Frants, V.G. Geyman, V.O. Nekhoroshev	66
METHODS OF TRIGGERING FOR PSEUDOSPARK SWITCH WITH THE TRIGGER UNIT BASED ON AN AUXILIARY GLOW DISCHARGE N.V. Landl, Y.D. Korolev, O.B. Frants, A.V. Bolotov, V.O. Nekhoroshev	67
INVESTIGATION OF SUBNANOSECOND BREAKDOWN IN SLIT DISCHARGE M.A. Lavrukhin, P.A. Bokhan, P.P. Gugin, G.V. Shevchenko, D.E. ZAKrevsky	68
CHARACTERIZATION OF NORMAL GLOW DISCHARGE AT ATMOSPHERIC PRESSURE DEPENDING ON DIFFERENT CATHODE SHAPES A.V. Kazak, P.A. Ivanova, I. Rafatov, L.V. Simonchik, M.U. Tomkavich	69
UTILIZING IONIZATION REGION MODEL TO INTERPRET THE ION FLUX MEASUREMENT RESULTS IN HIPIMS PLASMA WITH A TUNGSTEN TARGET G.S. Lomonosov, D.V. Kolodko, A.V. Tumarkin, M.M. Kharkov, A.V. Kaziev	70
CONDITIONING A MOLYBDENUM CATHODE SURFACE BY HIGH-VOLTAGE SUBNANOSECOND PULSES Yu.A. Zemskov, Yu.I. Mamontov, I.V. Uimanov	71
KINETICS OF THE RADIAL RUNAWAY ELECTRON FLOW IN A TRANSVERSAL MAGNETIC FIELD Yu.I. Mamontov, M.I. Yalandin, N.M. Zubarev	72
MEASUREMENT OF W-FUZZ CATHODE VACUUM ARCS OPERATION TIME DEPENDING ON THE W-FUZZ THICKNESS P.S. Mikhailov, I.L. Muzyukin, Yu.A. Zemskov, I.V. Uimanov	73

MEASUREMENTS OF VACUUM ARC THRESHOLD CURRENT FOR CADMIUM CATHODE: CUTOFF CURRENT AND ARC INITIATION PROBABILITY P.S. Mikhailov, I.L. Muzyukin, I.V. Uimanov	74
MEASUREMENT OF THE TOTAL ION CURRENT IN AN ARC DISCHARGE ON A W-FUZZ SURFACE AT CURRENTS CLOSE TO THE THRESHOLD P.S. Mikhailov, I.L. Muzyukin, Yu.A. Zemskov, I.V. Uimanov	75
USING A THOMSON SPECTROMETER TO ANALYZE THE PLASMA FLOW OF A VACUUM ARC I.L. Muzyukin, P.S. Mikhailov	76
INVESTIGATION OF ELECTRICAL CURRENT IN JET BASED ON GLOW DISCHARGE N.V. Landl, A.V. Bolotov, Y.D. Korolev, O.B. Frants, V.G. Geyman, V.O. Nekhoroshev	77
EROSION OF VACUUM ARC CATHODES AT DIFFERENT DURATIONS OF CURRENT PULSES A.G. Nikolaev, V.D. Gridilev, E.M. Oks, G.Yu. Yushkov	78
MULTI-CHARGED IONS OF CONDUCTIVE MATERIALS IN PLASMA OF HIGH-CURRENT VACUUM ARC DISCHARGE OF SUBMICROSECOND DURATION A.G. Nikolaev, V.P. Frolova, A.V. Nikonenko	79
ASIMMETRIC PLASMA OF LOW-PRESSURE DISCHARGE S.P. Nikulin	80
RADIATIVE INFLUENCE OF ENERGY EXCHANGE IN AR+H ₂ PLASMA ARC PROCESSES N.V. Obraztsov, N.K. Kurakina, S.A. Averyanova, R.I. Zhiligitov, Iu.V. Murashov	81
PLASMA EMISSION SPECTRUM FORMED DURING MICROPROTRUTION EXPLOSION E.V. Oreshkin	82
EXTENDED HOLLOW CYLINDRICAL GRID ELECTRON EMITTER BASED ON LOW PRESSURE ARC DISCHARGE E.V. Ostroverkhov, V.V. Denisov, S.S. Kovalsky, V.V. Krivshenko	83
ESTABLISHMENT OF STATIONARY DIFFUSE MODE IN VACUUM ARC DISCHARGE M.S. Paramonov, A.D. Melnikov, A.I. Belostotskii, R.A. Usmanov, N.N. Antonov, A.V. Gavrikov	84
SPECTRAL ENERGY CHARACTERISTICS' STUDY OF COAXIAL ABLATIVE PULSED PLASMA ACCELERATOR D.S. Pasynkova, D.E. Polevoy, D.A. Gololobov, V.D. Telekh	85
ON "MEMORY" OF PLASMA STRUCTURES FORMED IN A COAXIAL BARRIER DISCHARGE IN ARGON FLOW A.V. Petryakov, Yu.S. Akishev, S.A. Ermolaeva, M.A. Medvedev	86
BREAKDOWN FEATURES OF ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE UNDER NANOSECOND PULSES I.F. Punanov, R.V. Emlin, P.A. Morozov, V.D. Kulikov, S.S. Gostev, A.S. Zabolotnov	87

STRUCTURE OF PLASMA JETS FORMED BY A HIGH-CURRENT VACUUM ARC DISCHARGE A.G. Rousskikh, A.S. Zhigalin, V.I. Oreshkin, A.M. Kuzminykh, D.L. Shmelev, V.A. Gasilov	88
PATTERNS OF GENERATION OF EXTENDED GAS-METAL BEAM-PLASMA FORMATIONS M.V. Savchuk, V.V. Denisov, S.S. Kovalsky, A.A. Leonov	89
METAL PARTICLES IN ATMOSPHERIC PRESSURE GLOW DISCHARGE PLASMA: GENERATION, FORMATION OF FLOWS, OPTICAL EMISSION K.P. Savkin, D.A. Sorokin, D.V. Beloplotov, A.G. Nikolaev, M.V. Shandrikov, A.A. Cherkasov	90
VACUUM ARC PLASMA DECAY AFTER INTERRUPTION OF THE DISCHARGE CURRENT WITH COMPAUND COPPER-CROMIUM CATHODE K.P. Savkin, E.M. Oks, A.G. Nikolaev, V.P. Frolova, and G.Yu. Yushkov	91
HIGH VOLTAGE SUBNANOSECON SWITCHING SCENARIO IN PLASMA DEVICE EPTRON COMBING OPEN AND CAPILLARY DISCHARES I. Schweigert, P.A. Bokhan, P.P. Gugin, M.A. Lavrukhin, D. Zakrevsky	92
MINIMUM BREAKDOWN VOLTAGES OF COAXIAL DIODE FILLED WITH RAREFIED GAS A.V. Kozyrev, N.S. Semeniuk	93
ELECTROPHYSICAL PARAMETERS OF THE “PHYSICALLY PURE” ABNORMAL DISCHARGE IN INERT GASES P.A. Bokhan, P.P. Gugin, M.A. Lavrukhin, G.V. Shevchenko, D.E. Zakrevsky	94
PASCHEN CURVES OF THE “PHYSICALLY PURE” ABNORMAL DISCHARGE IN HELIUM, HYDROGEN AND ITS MIXTURES P.A. Bokhan, P.P. Gugin, M.A. Lavrukhin, G.V. Shevchenko, D.E. Zakrevsky	95
MODELING THE DEVELOPMENT OF A MACROSCOPIC PLASMA JET FORMED BY A HIGH-CURRENT VACUUM-ARC DISCHARGE D.L. Shmelev, V.I. Oreshkin, A.G. Rousskikh	96
SUPRATHERMAL ELECTRONS IN EXPANDING PLASMA OF VACUUM ARC JET D.L. Shmelev, S.A. Barengolts, I.V. Uimanov	97
EFFECT OF DOUBLE PULSES FOR RUNAWAY ELECTRONS EMISSION IN AN AIR GAP S.A. Shunailov, N.M. Zubarev, L.N. Lobanov, M.R. Ulmaskulov, K.A. Sharypov and M.I. Yalandin	98
FEATURES OF HIGH-VOLTAGE NANOSECOND DISCHARGE IN GAPS WITH HIGHLY INHOMOGENEOUS DISTRIBUTION OF ELECTRIC FIELD FILLED WITH DENSE MEDIA D.A. Sorokin, D.V. Beloplotov, B. Zaytsev	99
PERIODIC STRUCTURE OF A PLASMA CHANNEL OF A LOW-CURRENT DISCHARGE IN AN ARGON FLOW AT ATMOSPHERIC PRESSURE D.A. Sorokin, D.V. Beloplotov, K.P. Savkin	100

SELF-OSCILLATORY SECONDARY EMISSION DISCHARGE AND ITS APPLICATIONS I.A. Sorokin	101
INFLUENCE OF AXIAL AND RADIAL PLASMA DENSITY DISTRIBUTIONS ON THE CHARACTERISTICS OF A PLASMA ANTENNA V.P. Stepin, V.I. Zhukov, S.E. Andreev, N.N. Bogachev	102
EXPERIMENTAL STUDY ON THE PROPERTIES OF PLASMA-ACTIVATED WATER PREPARED BASED ON BUBBLING-DBD CONFIGURATION AND ITS PERFORMANCE IN THE DECOMPOSITION OF OXYTETRACYCLINE SOLUTION Ying Sun, Yunlong Liu	103
COMPARISON OF PLASMA PARAMETERS OF PLASMA DIFFUSE JETS AND RED COLUMNAR SPRITES V.F. Tarasenko, E.Kh. Baksht, D.A. Sorokin, V.P. Vinogradov	104
EXPERIMENTAL MODELING OF “GLOW” AND “BEADS” AREAS IN RED SPRITE ANALOGUE DISCHARGES V.F. Tarasenko, E.Kh. Baksht, V.P. Vinogradov	105
FEATURES OF DC MICRODISCHARGES BETWEEN METAL AND LIQUID ELECTROLYTE ELECTRODES IN THE OPEN ATMOSPHERE G.K. Tazmeev, K.K. Tazmeev	106
REDUCTION OF AZIMUTHAL INHOMOGENEITY OF A RADIALY CONVERGING ELECTRON BEAM IN A GRID PLASMA CATHODE SOURCE M.S. Torba, S.Yu. Doroshkevich, M.S. Vorobyov, A.A. Grishkov, N.N. Koval, M.G. Volis	107
SHOCK WAVE PROPAGATION IN A HIGH-PRESSURE GAS-DISCHARGE CHAMBER, COMPARISON OF EXPERIMENT AND NUMERICAL MODELING J.V. Triaskin, A.V. Budin, M.E. Pinchuk, N.V. Tryaskin, A.A. Bogomaz	108
AVALANCHES OF NANOPLASMAS FORMATION VIA ELECTRICAL EXPLOSIONS OF HELIUM-FILLED TUNGSTEN NANOWIRES M.M. Tsventoukh	109
DIAGNOSTICS OF THE PROCESS OF PLASMA MASS SEPARATION IN CONFIGURATION WITH POTENTIAL WELL R.A. Usmanov, A.V. Gavrikov, N.N. Antonov, A.P. Oiler, R.A. Timirkhanov, V.P. Smirnov	110
NUMERICAL ASSESMENT OF A MAGNETIC FILTER INFLUENCE ON THE ICP DISCHARGE IN A PLASMA SOURCE WITH 4 RADIO-FREQUENCY DRIVERS V.A. Vointsev, I.V. Shikhovtsev, D.Yu. Gavrisenko	111
ESTIMATES OF THE ENERGY OF A MAGNETIZED BUNCH OF RUNAWAY ELECTRONS BY THE TIME-OF-FLIGHT METHOD AND FROM ITS MICROWAVE RADIATION L.N. Lobanov, K.A. Sharypov, S.A. Shunailov, M.I. Yalandin and N.M. Zubarev	112
MODEL OF INDUCTIVE DISCHARGE IN A NE-H ₂ MIXTURE A.G. Yastremskii, S.A. Yampolskaya, D.S. Churkin, R.A. Tkachenko, E.S. Kargapol'tsev	113

BRANCHING CHARACTERISTICS OF 3M LONG AIR GAP STREAMER DISCHARGE UNDER POSITIVE LIGHTNING IMPULSE VOLTAGE Ruiqian Zhang, Zhiwei Li, Yujian Ding	114
NUMERICAL SIMULATION OF THE GENERATION OF THE PLASMA FORMATION IN A HOLLOW ANODE FOR VACUUM ARC PLASMA ASSISTED DEPOSITION SYSTEM D.D. Zaytsev, T.V. Koval, V.V. Denisov, M.V. Savchuk	115
INVESTIGATION OF THE FACTORS INFLUENCING THE COPPER CATHODE CONDITIONING PROCESS Yu.A. Zemskov, Yu.I. Mamontov, I.V. Uimanov	116
STUDY OF THE ION COMPOSITION OF SHORT-DURATION VACUUM ARC PLASMA WITH SUBMICROSECOND TIME RESOLUTION Yu.A. Zemskov, I.V. Uimanov	117
INFLUENCE OF AXIAL MAGNETIC FIELD ON THE CHARGED PARTICLE FLOW FROM A CONICAL CATHODE IN A GAS IN THE SPACE-CHARGE-LIMITED CURRENT MODE M.A. Belyaev, N.M. Zubarev, O.V. Zubareva	118
KINETICS AND DYNAMICS OF RUNAWAY ELECTRONS IN GAS DIODES WITH CONICAL CATHODES A.V. Kozyrev, N.S. Semeniuk, M.I. Yalandin, N.M. Zubarev, O.V. Zubareva	119
DIMENSIONS OF NEAR-CATHODE PLASMA MICROREGIONS—SOURCES OF RUNAWAY ELECTRONS—UNDER CONDITIONS OF A SHARPLY INHOMOGENEOUS ELECTRIC FIELD M.I. Yalandin, N.M. Zubarev, O.V. Zubareva	120
ESTIMATES OF AVALANCHE PARAMETERS FOR SUBRELATIVISTIC RUNAWAY ELECTRONS IN A SUPERCRITICAL ELECTRIC FIELD N.M. Zubarev, O.V. Zubareva	121
THE STUDY OF ION-ELECTRON EMISSION AND SPUTTERING OF PERSPECTIVE MATERIALS FOR THE INERTIAL ELECTROSTATIC CONFINEMENT FUSION DEVICE CATHODE E.D. Zyablitseva, I.A. Prokuratov, Yu.V. Mikhailov, A.S. Bakulina	122
INFLUENCE OF PLASMA BUBBLE PROCESS ON HYDROGEN PRODUCTION CHARACTERISTICS IN METHANOL-WATER MIXTURES Yanbin Xin, Shangfei Lei, Jingyu Liu, Quanli Wang, Bing Sun	123
DYNAMICS AND STRUCTURES OF AN ACTIVE COULOMB PARTICLES IN GAS- DISCHARGE PLASMA M.M. Vasiliev, R.A. Syrovatka, E.A. Kononov, R.V. Senoshenko, O.F. Petrov	124
 SECTION 2	
GAS-DISCHARGE METHODS FOR SURFACE MODIFICATION AND	
COATING DEPOSITION:	
surface modification, ion implantation, combined methods of surface treatment,	
neutron and synchrotron methods of diagnostics	125

ELECTRON BEAM SYNTHESIS OF THERMAL PROTECTIVE CERAMIC COATINGS BASED ON ZIRCONIUM DIOXIDE IN THE FOREVACUUM PRESSURE RANGE A.A. Andronov, D.B. Zolotukhin, A.V. Tyunkov, Yu.G. Yushkov	126
PILOT TECHNOLOGICAL INSTALLATION OF ELECTRON BEAM SYNTHESIS OF CERAMIC COATINGS IN A FOREVACUUM A.A. Andronov, D.B. Zolotukhin, A.V. Tyunkov, Yu.G. Yushkov	127
MODIFICATION OF TUNGSTEN SURFACE PROPERTIES BY EXPOSURE TO HIGH- ENERGY COMPRESSION PLASMA FLOW V.M. Astashynski, N.B. Bazylev, G.M. Dzagnidze, A.M. Kuzmitski, P.N. Shoronov	128
SURFACE FINISHING OF 17-4PH STEEL COMPONENTS FOR BIOMEDICAL APPLICATIONS MADE BY BINDER JETTING. A COMPARISON BETWEEN MASS FINISHING AND VACUUM PLASMA TECHNIQUES M. Bestetti, A.L. Huspek, M. Pozzi, M. Mariani and N. Lecis	129
PULSED ELECTRIC-FIELD-INDUCED SURFACE MODIFICATION IN NATURAL GALENA I.Zh. Bunin, I.A. Khabarova, M.V. Ryazantseva	130
DEPOSITION BY DIFFUSION FLUX D.A. Butniakov, I.A. Sorokin, D.V. Kolodko	131
FORMATION OF GAS AND METAL ION BEAMS IN A SOURCE BASED ON A HIGH- CURRENT PULSED MAGNETRON DISCHARGE A.A. Cherkasov, E.M. Oks, K.P. Savkin, M.V. Shandrikov	132
CHANGE IN THE MICRORELIEF OF THE SURFACE OF THE POLYPROPYLENE ACTIVATED IN LOW-TEMPERATURE ATMOSPHERIC PRESSURE PLASMA k.A. Demin, S.S. Agnaev, S.D. Dondukov, A.N. Khagleev, A.P. Semenov	133
ABOUT THE RESULTS OF THE PROJECT «IN SITU METHODS OF SYNCHROTRON STUDIES OF MULTILAYER FUNCTIONAL STRUCTURES WITH UNIQUE PARAMETERS AND PROPERTIES CREATED BY BEAM-PLASMA SURFACE ENGINEERING» V.V. Denisov, A.D. Teresov, N.N. Koval, N.A. Ratakhin, A.N. Schmakov, A.A. Leonov S.S. Kovalsky, Yu.A. Denisova, E.V. Ostroverkhov, D.Yu. Ignatov, M.V. Savchuk, M.S. Syrtanov, M.V. Andreev	134
APPLICATION FEATURES OF A GRID PROBE FOR ANALYZING THE COMPOSITION OF PARTICLE FLUXES FROM A DISCHARGE PLASMA IN A MIXTURE OF INERT GAS AND METAL VAPOR D.R. Emlin, N.V. Gavrilov	135
INVESTIGATION OF ZINC THIN FILMS OBTAINED BY HIGH-RATE DEPOSITION FROM A METAL CLUSTER PLASMA OF LOW-PRESSURE ARC D.R. Emlin, N.V. Gavrilov	136
THE MECHANISM OF CONTRACTION OF A JET RADIO-FREQUENCY INDUCTIVELY COUPLED DISCHARGED AT INTERMEDIATE PRESSURE A.A. Esinalin, V.S. Zheltukhin, A.Y. Shemakhin	137

METHODS OF IMPLEMENTING STABLE MODES OF ELECTRON BEAM GENERATION IN A SOURCE WITH A PLASMA CATHODE D.A. Gorkovskaia, M.S. Vorobyov, M.A. Mokeev, V.N. Devyatkov, A.A. Grishkov, S.Yu. Doroshkevich.....	138
PHYSICAL MECHANISM OF A TiHfN COATING ACTIVATION BY INTERMEDIATE PRESSURE RF PLASMA M.M. Grebenshchikova, O.R. Grebenshchikov, V.S. Zheltukhin	139
DC MAGNETRON DEPOSITION WITH PURE BORON TARGET IN REACTIVE GASES ATMOSPHERES V.D. Gridilev, G.Yu. Yushkov	140
WIDE-APERTURE SOURCE OF LOW-ENERGY ION BEAMS FOR PRECISION ADDITIVE MANUFACTURING N.A. Ashurbekov, M.Z. Zakaryaeva, K.O. Iminov, K.M. Rabadanov, G.S. Shakhsinov, H.Sh. Hizriev	141
BEHAVIOUR OF HIGH-ENTROPY NBTAMOW ALLOY IN LOW-TEMPERATURE PLASMA N.I. Ilinykh, S.A. Ilinykh, I.A. Malkova, B.R. Gelchinski, A.A. Rempel	142
GD-O-N COATINGS DEPOSITED BY REACTIVE ANODIC EVAPORATION IN LOW PRESSURE ARC A.S. Kamenetskikh, P.V. Tretnikov, A.V. Chukin, D.A. Mandrygina.....	143
THE EFFECT OF THE MOLECULAR MODIFIER STRUCTURE ON THE RADIATION STABILITY OF HYBRID HALIDE PEROVSKITES E.V. Katkov, I.S. Zhidkov, V.V. Ozerova, P.A. Troshin	144
MODIFICATION OF CERAMICS BASED ON ZIRCONIUM DIOXIDE BY A LARGE- RADIUS PULSED ELECTRON BEAM AT FOREVACUUM PRESSURE A.V. Kazakov, A.S. Klimov, E.M. Oks, A.E. Petrov, N.A. Panchenko	145
DUPLEX TREATMENT OF WC-CO CUTTING INSERTS BY PLASMA NITRIDING AND MAGNETRON SPUTTER DEPOSITION OF CrAlN COATINGS M.M. Kharkov, K.V. SMIRNOVA, A.V. Tumarkin, D.V. Kolodko, A.V. Kaziev, L. Xuan, J. Zhang	146
EFFECT OF GLOW DISCHARGE NITROGEN PLASMA ON THE PHYSICO- CHEMICAL PROPERTIES OF THE PCL-BASED 3D-SCAFFOLDS SURFACE U.V. Khomutova, O.A. Laput, D.A. Zuza, I.A. Kurzina	147
APPLICATION OF HIPIMS TECHNOLOGY FOR DEPOSITION OF FUNCTIONAL NANOCOMPOSITE COATINGS USING CERAMIC SHS-TARGETS Ph.V. Kiryukhantsev-Korneev, A.D. Chertova, E.A. Levashov	148
STRUCTURE FEATURES, ELECTRICAL AND OPTICAL CHARACTERISTICS OF HARD NANOCOMPOSITE Ti-Nb-B-C-N FILMS DEPOSITED BY MAGNETRON SPUTTERING Ph.V. Kiryukhantsev-Korneev, A.D. Chertova, E.V. Chernyshova, D.A. Kiselev, E.A. Levashov.....	149
EFFECT OF GAS PRESSURE ON HEATING OF NONCONDUCTING MATERIALS DURING THEIR ELECTRON BEAM TREATMENT A.S. Klimov, I.Yu. Bakeev, A.A. Zenin, E.M. Oks.....	150

ANISOTROPY OF FREE-SURFACE MAGNETO-HYDRODYNAMIC WAVE TURBULENCE E.A. Kochurin, N.M. Zubarev	151
STRUCTURE OF HIGH-ENTROPY COPPER-ALLOYED TiNbZrTaHf ALLOY N.N. Koval, N.A. Prokopenko, E.A. Petrikova, Yu.F. Ivanov, V.V. Shugurov, Yu.Kh. Akhmadev, O.S. Tolkachev	152
EFFECT OF TITANIUM CONTENT ON THE STRUCTURE AND PROPERTIES OF BORIDE COATINGS E.O. Kraynova, A.S. Grenadyorov, K.V. Oskomov, N.E. Madzhara, A.N. Zakharov, A.A. Solovyev	153
MULTIPHASE MULTILAYERED PVD COATINGS BASED ON REFRACTORY ELEMENTS O.V. Krygina, Yu.F. Ivanov, N.A. Prokopenko, E.A. Petrikova, O.S. Tolkachev	154
THE EFFECT OF A SUBMILLISECOND PULSED ELECTRON BEAM ON THE TIN COATING/SILUMIN SUBSTRATE SYSTEM O.V. Krygina, A.D. Teresov, P.V. Moskvina, N.A. Prokopenko, T.V. Koval	155
PLASMA MODIFICATION OF THE POLYTETRAFLUOROETHYLENE SURFACE FOR MEDICAL PURPOSE O.A. Laput, A.G. Korzhova, Yu.Kh. Akhmadev, I.A. Kurzina	156
EFFECT ON THE DEFORMATION HARDENING OF MODIFIED SURFACES OF TITANIUM-DOPED SILUMIN 319.0 SAMPLES BY IRRADIATION OF THE FILM SYSTEM/THE SUBSTRATE IS PULSED BY ELECTRON RADIATION V.Yu. Lavrov, A.A. Klopotov, Yu.F. Ivanov, A.M. Ustinov, D.V. Zagulyaev, N.A. Prokopenko, V.V. Shekhovtsov, G.G. Volokitin, O.M. Loskutov	157
NITRIDE VACUUM-ARC COATINGS TO INCREASE WEAR RESISTANCE OF CR ₁₂ MOV DIE STEEL A.A. Leonov, Yu.A. Denisova, V.V. Denisov, V.M. Savostikov, M.V. Savchuk, V.N. Tishchenko	158
DIFFUSE AND MICROCHANNEL FORMS OF HIGH-VOLTAGE NANOSECOND DISCHARGE IN DENSE GASES M.I. Lomaev, D.V. Beloplotov, D.A. Sorokin	159
INITIATION OF CARBON COMBUSTION BY HIGH-VOLTAGE NANOSECOND DISCHARGE IN ATMOSPHERIC-PRESSURE AIR M.I. Lomaev, D.V. Beloplotov, D.A. Sorokin	160
GROWTH AND CHARACTERIZATION OF W LAYERS CO-DEPOSITED IN HIPIMS DISCHARGE IN H ₂ /He/Ar MIXTURES G.S. Lomonosov, D.V. Kolodko, A.V. Tumarkin, M.M. Kharkov, A.V. Kaziev	161
HYDROGENATED CARBON COATINGS WITH SILICON AND OXYGEN, ALLOYED WITH METALS N.E. Madzhara, A.S. Grenadyorov, A.A. Solovyev	162
MÖSSBAUER STUDY OF THE Fe-6.25 AT. % Si ALLOY ATOMIC ORDERING UNDER THE Ar ⁺ IONS BEAMS E.V. Makarov, V.A. Semionkin, N.V. Gushchina, V.V. Ovchinnikov	163

SPARK DISCHARGE METHOD: STUDY OF THE INFLUENCE OF THERMOPHYSICAL PARAMETERS OF THE ELECTRODE MATERIAL ON THEIR EROSION A.D. Maksimov, E.I. Azarkevich, I.V. Beketov	164
ANALYSIS OF THE ION FLUX EXTRACTED FROM A DC MAGNETRON DISCHARGE WITH ALUMINUM TARGET N.V. Mamedov, D.V. Kolodko, G.S. Lomonosov, A.V. Tumarkin, M.M. Kharkov, M.S. Novikov, A.V. Kaziev	165
MAGNETRON SPUTTERING OF TI-AL-C MAX PHASES SHS TARGET FOR OXIDATION PROTECTION OF TI-AL-NB ALLOY A.A. Maslov, A.A. Nikolaev, K.N. Ramazanov	166
FEATURES OF NITRIDING OF STAINLESS STEELS IN A STREAM OF LOW-ENERGY IONS I.S. Abdullin, K.S. Mastjukov, S.V. Mironov, I.K. Nekrasov	167
INVESTIGATION OF THE PROPERTIES OF CERAMIC SIALCN AND SIALCO COATINGS OBTAINED BY AL EVAPORATION IN ORGANOSILICON VAPORS IN HOLLOW CATHODE ARC DISCHARGE A.I. Menshakov, Y.A. Brukhanova, E.V. Makarov	168
COMBINED CONTROL OF ELECTRON BEAM POWER IN AN ELECTRON SOURCE WITH A MULTI-ARC GRID PLASMA CATHODE M.A. Mokeev, V.N. Devyatkov, D.A. Gorkovskaia, M.S. Vorobyov, N.N. Koval, P.V. Moskvina	169
THE EFFECT OF NANOLAYER THICKNESS ON PHYSICAL AND MECHANICAL PROPERTIES AND STRUCTURAL PHASE COMPOSITION OF TIAL (N, C, O) COATING A.Yu. Nazarov, A.A. Tulina, K.N. Ramazanov, V.R. Muhamadeev, E.R. Kasimova	170
MONTE-CARLO STUDY OF SPACE RADIATION EFFECTS ON PEROVSKITES I.E. Novoselov, I.S. Zhidkov	171
PHASE AND STRUCTURAL TRANSFORMATIONS OF Y-AL-O COATINGS AFTER VACUUM HEAT TREATMENT G.M. Nurislamova, A.Yu. Nazarov, K.N. Ramazanov, V.R. Muhamadeev, E.R. Kasimova	172
PROPERTIES OF ORGANOSILICON COATINGS REMOTELY DEPOSITED FROM GLOW DISCHARGE IN ARGON AND HEXAMETHYLDISILOXANE MIXTURE FLOW D.A. Zuza, V.O. Nekhoroshev, A.G. Korzhova, A.N. Gorbunov	173
COMPUTER SIMULATION OF THERMAL FIELDS FOR THE FORMATION OF COMPOSITE BORON-CONTAINING SURFACE ALLOYS USING A LOW-ENERGY HIGH-CURRENT ELECTRON BEAM E.A. Pesterev, A.V. Solovyov, E.V. Yakovlev, V.I. Petrov, A.B. Markov	174
THE IMPACT OF THE TREATMENT METHOD ON THE APPEARANCE OF A BORON- CONTAINING SURFACE ALLOY CREATED THROUGH PULSED ELECTRON BEAM SYNTHESIS E.A. Pesterev, E.V. Yakovlev, V.I. Petrov, A.V. Solovyov, A.B. Markov	175

IDENTIFICATION AND ANALYSIS OF PLASTICIZATION PHYSICAL REGULARITIES OF HYPEREUTECTIC COMPOSITION SILUMIN BY THE COMPLEX ELECTRON-ION-PLASMA METHOD	
E.A. Petrikova, Yu.F. Ivanov, A.D. Teresov, N.A. Prokopenko, S.Yu. Doroshkevich	176
IMPROVING THE PERFORMANCE OF ALUMINIUM ALLOYS ARE MANUFACTURED ADDITIVELY USING ELECTRON BEAM TREATMENT	
E.A. Petrikova, Yu.Kh. Akhmadev, E.V. Yakovlev, M. Bestetti, A.L. Huspek, P.V. Moskvina	177
APPLICATION OF ASSISTING ACTION OF GAS DISCHARGE PLASMA GENERATED BY AN AUTONOMOUS SOURCE FOR THE FORMATION OF LAYERS AND ANTIFRICTION COATINGS WITH VACUUM-ARC EVAPORATION OF SHS CATHODES TI-C-MO-S	
V.M. Savostikov, A.A. Leonov, V.V. Denisov, Yu.A. Denisova, M.A. Khimich, M.S. Syrtanov, A.B. Skosyrskii	178
BEAM-PLASMA DISCHARGE IN CROSSED E-H FIELDS	
R.A. Selivanov, I.A. Sorokin	179
PLASMA SYNTHESIS OF GLASS-CERAMICS BASED ON NATURAL RAW MATERIALS	
M.A. Semenovych, V.V. Shekhovtsov, A.B. Ulmasov, N. Skripnikova	180
INVESTIGATION OF LOW-ENERGY LIGHT ION SPUTTERING OF TUNGSTEN FILMS IN THE LINEAR PLASMA DEVICE WITH A BEAM PLASMA	
N.S. Sergeev, Yu.M. Gasparyan	181
STUDY OF THE NI – 13.9 WT. % W ALLOY ANNEALING POSSIBILITY USING ION-BEAM TREATMENT	
K.V. Shalomov, N.V. Gushchina, V.V. Ovchinnikov, I.V. Gervasyeva, V.I. Voronin N.V. Proskurnina, V.I. Bobrovskii	182
EXTENSION THE OPERATING RANGE OF CONTINUOUS MAGNETRON DISCHARGE WITH A COLD CATHODE IN SELF-SPUTTERING MODE	
M.V. Shandrikov, A.A. Cherkasov, E.M. Oks	183
BASICS OF MULLITE SYNTHESIS UNDER PLASMA IMPACT	
V.V. Shekhovtsov, M.A. Semenovych, A.B. Ulmasov, O.G. Volokitin	184
MOLECULAR MOBILITY IN THE NEAR-SURFACE NANOLAYERS OF NASCENT AND SINTERED UHMWPE REACTOR POWDERS AS REVEALED BY PLASMA-INDUCED THERMOLUMINESCENCE	
T.D. Shidlovskiy, L.P. Myasnikova, V.I. Siklitsky, V.L. Preobrazhenskii M.M. Cygankov, A.S. Luzgin	185
APPLICATION OF BORON CARBIDE COATINGS BY PULSED ELECTRON BEAM EVAPORATION	
D.A. Shpanov, M.S. Vorobyov, R.A. Kartavtsov, S.Yu. Doroshkevich, E.A. Petrikova, N.A. Prokopenko, M.S. Petyukevich	186
IN SITU STUDIES OF THE PROCESS OF FORMING TINBZRTAHFCU FILMS BY VACUUM- ARC PLASMA-ASSISTED METHOD	
V.V. Shugurov, N.A. Prokopenko, E.A. Petrikova, Yu.F. Ivanov, N.N. Koval, Yu.Kh. Akhmadev, M.S. Vorobyov, A.N. Shmakov	187

STUDY OF TEMPERATURE DYNAMICS ON THE TARGET SURFACE UNDER THE INFLUENCE OF A PULSED ELECTRON BEAM OF SUB-MILLISECOND DURATION A.D. Teresov, T.V. Koval, P.V. Moskvina	188
AUTOMATIZED SYSTEM OF SMALL-SIZED ION ACCELERATORS ION-PLASMA TREATMENT I.A. Kanshin, N.R. Laur, Yu.G. Trifonova	189
STUDY OF THE TIN-CU COATINGS DEPOSITED ON ALLOY R18 BY VACUUM-ARC EVAPORATION AND MAGNETRON SPUTTERING D.B.D. Tsyrenov, A.P. Semenov, I.A. Semenova, N.S. Ulahanov	190
INVESTIGATION OF THE PROPERTIES OF COATINGS BASED ON THE ALUMINUM OXIDE SYSTEM OBTAINED BY VACUUM ARC DEPOSITION METHOD A.A. Tulina, A.Yu. Nazarov, K.N. Ramazanov	191
MAGNETRON DISCHARGE WITH ASYMMETRIC ROTATING MAGNETIC FIELD A.V. Tumarkin, A.V. Kaziev, M.M. Kharkov, D.V. Kolodko, Y.D. Kiryukhin	192
BEAM-PLASMA MODIFICATION OF STRUCTURAL MATERIALS IN THE FOREVACUUM PRESSURE REGION A.V. Tyunkov	193
INFLUENCE OF BASE TEMPERATURE ON ADHESION PROPERTIES OF YSZ COATINGS A.V. Tyunkov, A.A. Andronov, D.B. Zolotukhin, Yu.G. Yushkov	194
EFFECT OF ZrO_2 ADDITION ON THE STRUCTURE OF $MgAl_2O_4$ SPINEL PRODUCED BY PLASMA MELTING V.V. Shekhovtsov, M.A. Semenovych, A.B. Ulmasov	195
IN-SITU SYNCHROTRON X-RAY DIFFRACTION STUDY OF PHASE EVOLUTION IN FE-CR-AL-ZR SURFACE ALOY E.V. Yakovlev, E.A. Pesterev, A.V. Schneyder, A.B. Markov	196
PULSE-BY-PULSE PHASE EVOLUTION IN THE B-FILM/TI-SUBSTRATE SYSTEM DURING ELECTRON BEAM PROCESSING E.V. Yakovlev, E.A. Pesterev, A.V. Soloviyov, A.V. Schneyder, A.B. Markov	197
SYNTHESIS OF CERAMIC COATINGS BASED ON GADOLINIUM ZIRCONATE IN THE FOREVACUUM PRESSURE RANGE Yu.G. Yushkov, A.A. Andronov, D.B. Zolotukhin, A.V. Tyunkov	198
SYNTHESIS OF COATINGS BASED ON BORON COMPOUNDS WITH GAS BY ELECTRON BEAM EVAPORATION IN A FOREVACUUM Yu.G. Yushkov, A.A. Andronov, A.V. Tyunkov	199
ELECTRICAL AND OPTICAL PROPERTIES OF SILICON CARBON FILMS PREPARED BY ELECTRON BEAM EVAPORATION OF SILICON CARBIDE V.A. Burdovitsin, L.J. Ngon A Kiki, A.A. Zenin	200
PHYSICAL AND MATHEMATICAL MODEL OF FISH LEATHER PROCESSING IN PLASMA OF LOW-PRESSURE RF DISCHARGE R.F. Akhverdiev, V.S. Zheltukhin, A.V. Chinilkin	201

SIMULATION OF RF PLASMA MODIFICATION OF FIBROUS FILLERS FOR POLYMER COMPOSITES I.Sh. Abdullin, I.K. Nekrasov, F.R. Sagitova, V.S. Zheltukhin	202
IMPROVING HYBRID PEROVSKITES STABILITY FOR SOLAR CELLS APPLICATION IN SPACE BY USING MOLECULAR MODIFIERS V.V. Ozerova, M.N. Saruchev, L.A. Frolova, E.Z. Kurmaev, A.I. Kukhareenko, P.A. Troshin, I.S. Zhidkov	203
ELECTRON BEAM AND ION-PLASMA MODIFICATION OF SURFACE ROUGHNESS OF YSZ COATINGS DEPOSITED BY FORE-VACUUM PLASMA-CATHODE ELECTRON SOURCE D.B. Zolotukhin, A.A. Andronov, A.V. Kazakov, A.V. Tyunkov, Yu.G. Yushkov	204
NUMERICAL MODEL OF IONIC SPECIES DENSITY AND COMPOSITION IN MULTICOMPONENT BEAM PLASMA PRODUCED BY E-BEAM EVAPORATION OF YSZ CERAMIC IN FORE-VACUUM D.B. Zolotukhin, A.A. Andronov, A.V. Tyunkov, Yu.G. Yushkov	205
PHOTOCHROMIC PROPERTIES OF MICROSTRUCTURED TUNGSTEN OXIDE O.A. Lutikova, M.E. Dokukin, D.P. Kulikova, A.V. Baryshev, A.V. Kaziev, M.M. Kharkov	206
INVESTIGATION OF ROTATING DBD PLASMA TREATMENT FOR IMPROVED SURFACE PROPERTIES IN EP/ALN COMPOSITES Fu Yongqiang, Yu Guanglin, Li Jie, Jiang Nan	207
CONFOCAL RAMAN SPECTROSCOPY OF THIN FILMS AND ION-MODIFIED OXIDE STRUCTURES Yu.V. Shchapova, A.F. Zatsepin, N.V. Gavrilov	208
 SECTION 3 PLASMA-CHEMICAL, ELECTROPHYSICAL AND LASER TECHNOLOGIES: environmental applications, production of nanopowders and functional materials	
GENERATORS FOR ELECTRIC PULSE CRUSHING WITH OPERATING VOLTAGE OF 50 KV V.M. Alexeenko, A.A. Zherlitsyn, S.S. Kondratiev, A.G. Sitnikov	210
INFLUENCE OF KEY PARAMETERS OF PLASMA-CHEMICAL SYNTHESIS ON THE PROPERTIES OF W-C-CO SYSTEM NANOPOWDERS A.G. Astashov, A.V. Samokhin, D.V. Fisunov, Yu.P. Kalashnikov, A.V. Terent'ev, N.V. Alekseev, I.S. Litvinova	211
DYNAMICS OF A MICROSPHERE WITH A DOUBLE-LAYERED SHELL IN A POLYMER MATRIX UNDER THE ACTION OF A SHOCK WAVE D.S. Boykov	212
CORONA DISCHARGE OZONE GENERATOR A.S. Chepusov, S.R. Korzhenevskiy, A.A. Komarskiy, A.V. Ponomarev, O.D. Krasniy	213
FORMAL-KINETIC MODELING OF AIR CLEANING IN A CLOSED PLASMA-CHEMICAL REACTOR WITH A PULSED CORONA DISCHARGE I.E. Filatov, D.L. Kuznetsov	214

USING PULSED CORONA DISCHARGE FOR AIR CLEANING FROM PYROLYSIS PRODUCTS OF PLASTICS AND ELASTOMERS I.E. Filatov, D.L. Kuznetsov, O.N. Tchaikovskaya	215
SPECTRAL FEATURES OF THE FUNDAMENTAL ABSORPTION EDGE IN HYBRID HALIDE PEROVSKITES UNDER THE INFLUENCE OF ACCELERATED PARTICLES M.F. Gerasimov, V.V. Ozerova, S.V. Nikiforov, E.Z. Kurmaev, L.A. Frolova, P.A. Troshin, I.S. Zhidkov	216
LIQUID RADIOACTIVE WASTE'S UTILIZATION AND IMMOBILIZATION IN AIR PLASMA Y. Ghoneim	217
SYNTHESIS OF CERIUM DIOXIDE NANOPARTICLES USING AN ELECTRON BEAM AND THEIR PHOTOCATALYTIC PROPERTIES V.G. Ilves, M.E. Balezin, A.S. Gerasimov, S.Yu. Sokovnin	218
RIBBON ELECTRON BEAM FOR GENERATION OF BEAM PLASMA AND BEAM- PLASMA TREATMENT OF POLYMERS IN THE PRESSURE RANGE OF 0.1-10 PA A.S. Klimov, J.E. Dagri, A.V. Dolgova, A.A. Zenin, E.M. Oks	219
STUDY OF THE ANTIBACTERIAL PROPERTIES OF ZINC OXIDE NANOPOWDER SUSPENSIONS AND COMPOSITES BASED THEREON TO MYCOBACTERIUM TUBERCULOSIS M.L. Kokorina, D.V. Belyaev, D.V. Vahrusheva, D.V. Dianov, S.Yu. Sokovnin	220
ANTITUMOR, ANTIBACTERIAL AND ANTIVIRAL TREATMENT METHODS USING A LOW-TEMPERATURE PLASMA SOURCE BASED ON A PIEZOTRANSFORMER E.M. Konchekov, N.G. Gusein-Zade, L.V. Kolik, T.I. Pavlik, D.M. Malakhov, D.A. Serov, D.E. Burmistrov, V.V. Gudkova, E.I. Grudiev, N.N. Bogachev, S.V. Gudkov	221
SURFACE RADIATION DISINFECTION OF CONFECTIONERY PRODUCTS L.I. Kozlova, M.E. Balezin, S.Yu. Sokovnin	222
INFLUENCE OF THE ORIENTATION OF THE METAL-CERAMIC PLATES ON THE DISTRIBUTION OF THE BEAM CURRENT DENSITY AT THE ANODE M.E. Balezin, M.A. Blagodatskikh, S.Yu. Sokovnin	223
SYNTHESIS OF OXIDE NANOPARTICLES USING AN ELECTRIC ARC PLASMATRON V.V. Osipov, V.V. Lisenkov, A.V. Podkin	224
FILAMENTATION AND OPTICAL BREAKDOWN OF AIR V.K. Oshlakov, V.E. Prokopiev	225
UV LASER TREATMENT FOR MODIFYING WETTABILITY OF METALLIC BIOMATERIAL SURFACES M.Yu. Panchenko, T.Yu. Sablina, I.A. Zyatikov, A.V. Puchikin, Yu.N. Panchenko	226
CALCULATION METHODOLOGY OF PLASMA WASTE TREATMENT SYSTEM AND ITS TECHNICAL AND FINANCIAL EVALUATION P.I. Petrenko, A.V. Pereslavytsev, A.V. Artemov, S.A. Voschinin, N.S. Chemodanov, D.Y. Karaskevich, V.G. Karaskevich	227

OBTAINING NANODISPERSED METALS IN THE PLASMA OF ELECTRIC DISCHARGE IN LIQUID P.I. Petrenko, A.V. Pereslavl'tsev, A.V. Artemov, S.A. Voschinin, N.S. Chemodanov	228
COMBINED TREATMENT WITH COLD ATMOSPHERIC PLASMA JET AND GOLD NANOPARTICLES WITH TYRP1 ANTIBODIES SUCCESSFULLY SUPPRESS TUMOR GROWTH IN VIVO I. Schweigert, M. Biryukov, A. Polyakova, N. Krychkova, O. Koval, E. Gorbunova, D. Zakrevsky, E. Milakhina, P.P. Gugin	229
PLASMA DYNAMIC SYNTHESIS OPTIMIZATION FOR ENHANCING THE PROCESS PRODUCTIVITY I.I. Shanenkov, A.A. Sivkov, I.S. Zhumabaev, A.I. Tsimmerman	230
FEATURES OF A NON-EQUILIBRIUM ATMOSPHERIC PRESSURE DISCHARGE SUSTAINED BY CONTINUOUS SUB-TERAHERTZ RADIATION S.V. Sintsov, A.V. Vodopyanov, A.P. Veselov, A.V. Sidorov, E.I. Preobrazhenskiy, A.P. Fokin, D.A. Sergeev, I.M. Kraev, A.A. Murzanev, M.Y. Glyavin	231
RADIATION CHEMICAL SYNTHESIS OF NANOPOWDER ZINC OXIDE AND ZINC OXIDE - SILVER COMPOSITES S.Yu. Sokolov, V.G. Il'ev, M.E. Balezin	232
CHEMICAL KINETICS IN AIR DBD PLASMA DEPENDING ON A VALUE OF APPLIED VOLTAGE O.M. Stepanova, V.N. Snetov, O.I. Grushko, I.A. Ruchkin, A.A. Dyachenko, M.E. Pinchuk	233
COMPACT FREQUENCY RECONFIGURABLE PIEZOELECTRIC SOURCE OF VARIOUS TYPES OF COLD ATMOSPHERIC PLASMA V.P. Stepin, N.N. Bogachev, A.S. Bakchaev, L.V. Kolik, E.M. Konchekov, D.M. Malakhov, N.G. Gusein-Zade	234
PLASMA ARC REACTOR FOR SYNTHESIS OF LaB_6 A.A. Svinukhova, A.V. Spodina	235
FEATURES OF TEMPERATURE FIELD DISTRIBUTION DURING ELECTRIC ARC SYNTHESIS IN AIR Y.A. Neklyay, Y.Z. Vassilyeva, A.Y. Pak, R.D. Gerasimov, A.V. Kurdyukov	236
HIGH-ENTROPY BORIDE SYNTHESIS BY VACUUM-FREE ARC DISCHARGE PLASMA Y.Z. Vassilyeva, A.Y. Pak, Z.S. Bolatova, Y.A. Neklyay, A.A. Svinukhova	237
CHARACTERISTIC EVOLUTION OF PULSED SPARK DISCHARGE AND ITS APPLICATION IN ENERGY SMALL MOLECULES CONVERSION S. Zhang, L. Li, C. Zhang, T. Shao	238
LASER PULSED IMPACT ON $B-Ga_2O_3$ CERAMICS SAMPLES B.P. Aduyev, N.L. Aluker, A.Yu. Mitrofanov, A.E. Muslimov	239
PLASMA CATALYSIS FOR EFFICIENT UTILIZATION OF GREENHOUSE GASES UNDER AMBIENT CONDITION D.H. Mei, H. Jiang, J.Y. Wang, S.Y. Liu, Z. Fang	240

IMPACT OF WATER VAPOR ON NITROGEN FIXATION IN ATMOSPHERIC PRESSURE O ₂ /N ₂ PLASMA JETS Jiang Shuai	241
COMBINED FIELD SHAPER OF STEEL BASE WITH CUNB WIRE INSERT V.I. Krutikov, A.V. Spirin, E.V. Zaytsev, S.N. Paragin	242
 SECTION 4	
POWER SUPPLY FOR RESEARCHES AND APPLICATIONS: generators of continuous, pulse-periodic and pulsed action, gas switches, pulsed power machines and accelerators	243
 FEATURES OF STATISTICAL REGULATIONS OF A CAPACITIVE ENERGY STORAGE WITH PARALLEL-CONNECTED BRANCHES V.M. Alexeenko, A.A. Zherlitsyn, E.V. Kumpyak	
244	
COMPACT UWB RADIATION SOURCE BASED ON THE RADAN GENERATOR A.M. Efremov, S.B. Alekseev, E.S. Nekrasov	245
RESEARCH ON A RUGGEDIZED MEGAWATT-LEVEL SOLID-STATE PULSE GENERATOR Jingming Gao, Ruixin Yu, Xibiao Yang, Song Li, Hanwu Yang	246
ON THE MODELING OF PLASMA JET DYNAMICS IN LABORATORY EXPERIMENTS WITH A PULSED SOURCE Gasilov V.A., Savenko N.O., Urvachev E.M., Grushin A.S., Loseva T.V., Poklad Yu.V.	247
500 KHZ HIGH-VOLTAGE SOLID-STATE-PLASMA NANOSECOND GENERATOR P.A. Bokhan, P.P. Gugin, M.A. Lavrukhin, D.E. Zakrevsky	248
DIAGNOSTICS OF CURRENT DISTRIBUTION IN PLANAR LINER IMPLOSION V.A. Kokshenev, A.V. Shishlov	249
OPERATING MODES OF THE FERROMAGNETIC CORE OF THE LOAD CURRENT TRANSFORMER IN A CASCADE CIRCUIT ON THE GIT-12 GENERATOR V.A. Kokshenev, V.A. Sinebrykhov, A.A. Zherlitsyn	250
MODELING OF A SELF-SUSTAINED HIGH-VOLTAGE GLOW DISCHARGE IN A SOURCE WITH A GRID PLASMA CATHODE T.V. Koval, R.A. Kartavtsov, M.S. VOROBYOV, N.N. Koval, S.Yu. Doroshkevich	251
APPLICATIONS OF SUBNANOSECOND SWITCHES WITH HIGH PULSE REPETITION FREQUENCY BASED ON SLIT DISCHARGE M.A. Lavrukhin, P.A. Bokhan, P.P. Gugin, G.V. Shevchenko, D.E. Zakrevsky	252
CCD SPECTROGRAPH FOR PULSED PLASMA INVESTIGATION A.I. Lipchak	253
ACCELERATION OF THE PICOSECOND RUNAWAY ELECTRON BUNCH IN THE CASCADE REGIME AT ATMOSPHERIC PRESSURE AIR L.N. Lobanov, G.A. Mesyats, A.G. Sadykova, K.A. Sharypov, V.G. Shpak, S.A. Shunailov, M.I. Yalandin, N.M. Zubarev	254

CHARACTERISTICS OF BREAKDOWN INITIATED BY RUNAWAY ELECTRONS IN A COAXIAL CHOPPING SPARK GAP FILLED WITH ATMOSPHERIC PRESSURE AIR L.N. Lobanov, K.A. Sharypov, S.A. Shunailov, M.I. Yalandin, N.M. Zubarev	255
RADIATION MAGNETIC GAS DYNAMICS SIMULATION OF PLASMA JETS O.G. Olkhovskaya	256
SOURCE OF POWERFUL NANOSECOND RADIATION PULSES OF A WIDE SPECTRAL RANGE BASED ON A HIGH-CURRENT VOLUME DISCHARGE IN XENON V.I. Baryshnikov, V.L. Paperny	257
SUBNANOSECOND, MEGAVOLT-RANGE VACUUM DIODES: THE STATE OF THE ART V.E. Patrakov, L.N. Lobanov, M.S. Pedos, S.N. Rukin, K.A. Sharypov, S.A. Shunailov, S.P. Timoshenkov, and M.I. Yalandin	258
A NEW CONCEPT: MULTI-SWITCH SHARED DRIVING Junfeng Rao	259
RADIOLYTIC TRANSFORMATION OF TOXICANTS IN THE PRESENCE OF HUMIC ACIDS A.V. Spirina, O.N. Tchaikovskaya, V.I. Solomonov, N.V. Udina	260
DEGRADATION IN E-BEAM IRRADIATED SOLUTIONS OF MEDICINES O.N. Tchaikovskaya, E.N. Bocharnikova, N.P. Bezlepkina, I.E. Filatov, V.I. Solomonov, A.V. Spirina, A.I. Lipchak, A.S. Makarova	261
SPECTRAL-LUMINESCENT PROPERTIES OF E-BEAM IRRADIATED DNA O.N. Tchaikovskaya, E.N. Bocharnikova, A.V. Spirina, V.I. Solomonov, D.A. Cheremokhin	262
MODELING OF FINE TUNING THE PARAMETERS OF HIGH-CURRENT ELECTRON BEAM FORMED IN A VACUUM MAGNETICALLY ISOLATED COAXIAL DIODE M.I. Yalandin, V.V. Rostov	263
FEATURES OF MEASURING THE DIAMETER OF A FOCUSED ELECTRON BEAM IN A FOREVACUUM A.A. Zenin, I.Yu. Bakeev, A.V. Dolgova, A.S. Klimov	264
DEVELOPMENT AND TESTS 1-MA, 40-KV AIR INSULATED LINEAR TRANSFORMER DRIVER STAGE A.A. Zherlitsyn, E.V. Kumpyak, A.D. Lenskiy, A.V. Pavlenko, A.N. Grigoriev	265
OPTIMIZATION OF THE HIGH ENERGY SWITCHES FOR SYNCHRONIZATION OF MULTIPLE PLASMA FOCUS DEVICES Kameel Arshad, Umair Sarwar, Aman-ur-Rehman	266
MODELING, CALCULATION AND COMPARISON OF SWITCHING CHARACTERISTICS OF A SELF-TRIGGERED TWO-ELECTRODE SPARK GAP AND A FIELD-DISTORTION THREE-ELECTRODE GAPS G.N. Kurapov, A.A. Bukharkin, M.V. Zhuravlev, G.E. Remnev, E.A. Kurapova, P. Glumac	267
PULSED X-RAY TUBES IN METAL-CERAMIC DESIGN D.S. Makhanko, B.A. Kozlov	268