

CONTENTS

MAGNETIC CONFINEMENT

(Stellarators, Tokamaks, Alternative Conceptions)

CONFINEMENT PHYSICS OF HELICAL PLASMAS VERSUS TOKAMAKS	3
K. Yamazaki, M. Kikuchi	
PERTURBATIVE TRANSPORT EXPERIMENTS ON TJ-II FLEXIBLE HELIAC	8
F. Castejón, E. Ascasíbar, C. Alejaldre, J. Alonso, L. Almoguera, A. Baciero, R. Balbín, E. Blanco, M. Blaumoser, J. Botija, B. Brañas, A. Cappa, R. Carrasco, J. R. Cepero, A.A. Chmyga, J. Doncel, N.B.Dreval, S. Eguilior, L. Eliseev, T. Estrada, O. Fedyanin, A. Fernández, J.M.Fontdecaba, C. Fuentes, A. García, I. García-Cortés, B.Gonçalves, J. Guasp, J. Herranz, A.Hidalgo, C. Hidalgo, J. A. Jiménez, I. Kirpichev, S.M. Khrebtov, A.D. Komarov, A.S.Kozachok, L. Krupnik, F. Lapayese, K. Likin, M. Liniers, D. López-Bruna, A. López-Fraguas, J. López-Rázola, A López-Sánchez, E. de la Luna, A.Malaquias, R. Martín, M. Medrano, A.V.Melnikov, P. Méndez, K.J. McCarthy, F. Medina, B. van Milligen, I.S.Nedzelskiy, M.Ochando, L. Pacios, I. Pastor, S.S. Pavlov, M.A. Pedrosa, A. de la Peña, A. Petrov, S.Petrov, A. Portas, J. Romero, L. Rodríguez-Rodrigo, A. Salas, E. Sánchez, J. Sánchez, K.Sarksian, S.Schchepetov, N. Skvortsova, F. Tabarés, D. Tafalla, V. Tribaldos, C.F.A.Varandas, J. Vega and B. Zurro	
SOME RESULTS OF STELLARATOR OPTIMIZATION	13
M.I. Mikhailov, W.A. Cooper, M.F. Heyn, M.Yu. Isaev, A.A. Ivanov, V.N. Kalyuzhnyj, S.V. Kasilov, W. Kerbichler, A.A. Martynov, S.Yu. Medvedev, V.V. Nemov, J. Nührenberg, Yu.Yu. Poshekhonov, M.A. Samitov, V.D. Shafranov, A.A. Skovoroda, A.A. Subbotin, R. Zille	
ALFVÉN WAVE HEATING AND RUNAWAY DISCHARGES IN THE TCABR TOKAMAK	18
R.M.O. Galvão, V Bellintani Jr., A.G. Elfimov, J.I. Elizondo, A.N. Fagundes, A.A. Ferreira, A.M.M. Fonseca, Yu.K. Kuznetsov, E.A. Lerche, I.C. Nascimento, E.M. Ozono, L.F. Ruchko, W.P. de Sá, E.A.O. Saettone, E.K. Sanada, J.H.F. Severo, R.P. da Silva, V.S. Tsy-pin, O.C. Usuriaga, A. Vannucci	
NEW DEVELOPMENTS IN ICRF ANTENNAS AND NON-TRADITIONAL APPLICATIONS OF HF POWER ON TEXTOR	24
A.Lysoivan, A.Messiaen, R.Koch, F.Durodié, G.S.Amarante-Segundo, P.Dumortier, D.Van Eester, M.Vervier, R.Weynants, H.G.Esser, E.Gauthier, F.Hoekzema, V.Philipps, E.Westerhof	
AXISYMMETRIC OPEN MAGNETIC SYSTEMS FOR PLASMA CONFINEMENT	29
E.P. Kruglyakov, G.I. Dimov, A.A. Ivanov, V.S. Koidan	
PROGRESS IN COMPACT TOROID EXPERIMENTS	34
Thomas J. Dolan	
STABLE POTENTIAL FORMATION WITH NEUTRAL AND DUST PARTICLES IN EXPANDING MAGNETIC FIELD NEAR DIVERTOR PLATE	39
Yu. Tomita, Yu. I. Chutov	
PHYSICS OF THE DYNAMIC ERGODIC DIVERTOR	42
M.W. Jakubowski, K.H. Finken, S.S. Abdullaev, M. Kobayashi, M. Lehnen, R. Wolf	
CHARACTERISTICS OF MAIN CONFIGURATIONS OF WENDELSTEIN 7-X	45
T. Andreeva, J. Kisslinger, H. Wobig	
EFFECTS OF PLASMA HEATING ON THE MAGNITUDE AND DISTRIBUTION OF PLASMA FLOWS IN THE HELICAL DIVERTOR OF THE URAGAN-3M TORSATRON	48
V.V. Chechkin, L.I. Grigor'eva, E.L. Sorokovoy, M.S. Smirnova, A.S. Slavnyj, E.D. Volkov, N.I. Nazarov, S.A.Tsybenko, A.V. Lozin, A.P. Litvinov, V.G. Konovalov, V.N. Bondarenko, A.Ye. Kulaga, Yu.K. Mironov, S. Masuzaki, K. Yamazaki	
DISCRIMINATION BETWEEN MAGNETIC SHEAR AND TOROIDAL ELECTRIC FIELD EFFECTS IN TJ-II PLASMAS	51
D. López-Bruna, J. A. Romero, F. Castejón, T. Estrada, E. Ascasíbar and the TJ-II Team	
TEMPERATURE OF IMPURITY IONS IN A RF HEATED PLASMA OF THE U-3M TORSATRON AS MEASURED BY MEANS OF THE DOPPLER SPECTROMETRY	53
V.G.Konovalov, V.N.Bondarenko, A.N.Shapoval, A.S.Slavny, V.S.Voitsenya, E.D.Volkov	

EFFECT OF AC ELECTRIC FIELD WITH THE CHANGEABLE IN TIME FREQUENCY ON TRAPPED PARTICLES	56
A.Yu. Antufyev, A. A. Shishkin	
NUMERICAL STUDY OF THE MERCIER PLASMA STABILITY AND EQUILIBRIUM PLASMA CURRENTS IN AN L=2 YAMATOR	59
V.N.Kalyuzhnyj, V.V.Nemov	
ITB FORMATION DINAMICS IN THE URAGAN-3M TORSATRON INFERRED FROM MICROWAVE REFLECTOMETRY	62
A.I. Skibenko, O.S. Pavlichenko, E.D. Volkov, I.P. Fomin, V.L. Berezhniy, V.L. Ocheretenko, I.B. Pinos, Yu.Ya. Podoba, N.I. Nazarov, S.A. Tsybenko, A.P. Litvinov	
THE INFLUENCE OF THE HELICAL-COIL ANGULAR SIZE ON THE YAMATOR MAGNETIC SURFACE CHARACTERISTICS	65
V.G.Kotenko, E.D.Volkov	
MAPPING OF MAGNETIC FIELD LINES AT THE EDGE OF THE L=1 HELICAL-AXIS YAMATOR	67
G. G. Lesnyakov, V. G. Kotenko, E. D. Volkov	
ANALYSIS OF DRIFT ORBITS IN CLOSED MAGNETIC CONFIGURATIONS WITH DRIFT ROTATION TRANSFORMATION	70
V.I. Khvesyuk, A.Yu. Chirkov	
FEATURES OF FORMATION, CONFINEMENT AND STABILITY OF THE FIELD REVERSED CONFIGURATION	73
Sergei V. Ryzhkov	
<i><u>ITER AND FUSION REACTOR ASPECTS</u></i>	
RADIATION PROBLEMS FOR INSULATORS IN ITER AND BEYOND	76
E.R. Hodgson	
NEUTRAL PARTICLE ANALYSIS ON ITER	80
M.P. Petrov, V.I. Afanasiev, A.I. Kislyakov, S.S. Kozlovski, B.V. Ljublin, S.Ya. Petrov, E.V.Suvorkin	
MONTE CARLO SIMULATION OF MIGRATION OF FUSION PLASMA NEUTRONS - OPTIMIZATION AND TRAPS	84
B.V.Robouch, L.Ingrosso, J.S.Brzosko, K.Hübner	
<i><u>BASIC PLASMA PHYSICS</u></i>	
ADVANCED FLUID MODELLING OF TRANSPORT IN TOKAMAKS	89
Jan Weiland	
NON-MARKOVIAN EFFECTS IN TURBULENT DIFFUSION: KINETIC THEORY AND NUMERICAL SIMULATION	92
A.G. Zagorodny, V.I. Zasenko, J. Weiland, I. Holod	
LARGE SCALE INSTABILITIES IN THE ELECTROMAGNETIC DRIFT WAVE TURBULENCE AND TRANSPORT	96
A.I. Smolyakov, P.H. Diamond	
NUMERICALLY STABLE MODELING OF RADIO FREQUENCY FIELDS IN PLASMA	100
V.E.Moiseenko	
DEVELOPMENT OF TRANSPORT THRESHOLD MODEL OF NEOCLASSICAL TEARING MODES	103
M.S.Shirokov, A.B.Mikhailovskii, S.V.Kononov, V.S.Tsy-pin	
REGULAR AND CHAOTIC DYNAMICS OF DECAYING CASCADE OF WAVES IN PLASMA	106
V.A.Buts, A.P.Tolstoluzhsky	

EXCITATION OF COUPLED ELECTROMAGNETIC AND POTENTIAL WAVES IN INHOMOGENEOUS PLASMA CYLINDER IN MAGNETIC FIELD 109
V.V.Olshansky, A.A.Kurov, K.N.Stepanov

MODULATIONAL INSTABILITY OF THE ELECTRON CYCLOTRON WAVES IN AN ADIABATIC WAVE - PARTICLE INTERACTION 112
H. Hakimi Pajouh , H. Abbasi

SPACE PLASMA

ON POSSIBLE STATIONARY EQUILIVRIUM OF DUSTY SELF-GRAVITATING SPACE PLASMAS 115
V. Yaroshenko, A. Debosscher, M. Goossens, G. Morfill

PLASMA DYNAMICS AND PLASMA-WALL INTERACTION

RECENT ACHIEVEMENTS OF PLASMA RESEARCH AT IPJ, SWIERK, POLAND 118
Marek J. Sadowski

CHARACTERISTICS OF HIGH-TEMPERATURE DEUTERIUM PLASMA IN RPI-TYPE DEVICES 123
E. Skladnik-Sadowska, J. Baranowski, K. Czaus, M.J. Sadowski, T. Pisarczyk

LOCAL HYDROGEN RECYCLING IMPACT ON OPERATION OF ROD PLASMA INJECTORS 126
G.P. Glazunov, V.I. Tereshin, E.D. Volkov, A.L. Konotopskiy, J. Baranowski, M.J. Sadowski, E. Skladnik-Sadowska, J. Stanislawski, A. Wiraszka

TRANSPORTATION OF QSPA PLASMA STREAMS IN LONGITUDINAL MAGNETIC FIELD 129
V.A.Makhlaj, A.N. Bandura, V.V.Chebotarev, I.E.Garkusha, N.V. Kulik, D.G.Solyakov, V.I.Tereshin, S.A.Trubchaninov, A.V.Tsarenko, H.Wuerz

PLASMA ELECTRONICS

EXPERIMENTAL INVESTIGATIONS OF INTERACTION OF SUPERCRITICAL ELECTRON BEAMS WITH PLASMA 132
P.T. Chupikov, D.V. Medvedev, I.N. Onishchenko, B.D. Panasenko, Yu.V. Prokopenko, S.S. Pushkarev, R.J. Faehl, A.M. Yegorov

TRANSITION RADIATION OF THE MODULATED ELECTRON BEAM IN DUSTY PLASMA 135
I.O.Anisimov, Eu.V.Martysh, I.M.Voronov

FOCUSING OF ION BEAMS BY PERMANENT MAGNET PLASMA LENS 138
I. Protsenko, A. Goncharov , V. Gorshkov, S. Gubarev, I. Litovko, I. Brown

INVESTIGATIONS OF PROPAGATION, REFLECTION AND ACTION ON PLASMA OF STOCHASTIC ELECTROMAGNETIC RADIATION 141
A.Artamoshkin, A. Alisov, V. Antipov, I. Zagrebelny, N. Zemliansky, V. Karas`, V. Mirny, Ya. Fainberg

CHARGED PARTICLES ACCUMULATION IN DRIFT SPACE OF WARM ELECTRON BEAM DURING NON-STATIONARY VIRTUAL CATHOD EXISTENCE 144
A.A. Bizyukov, E.D. Volkov, I.K. Tarasov

SELF-CONSISTENT PENNING-MALMBERG TRAP 146
A.A. Bizyukov, E.D. Volkov, I.K. Tarasov

THE NONLINEAR THEORY OF THE ELECTRON AND ION BEAMES INTERACTION IN A SUPERCRITICAL MODE 149
V.A.Balakirev, N.I.Onishchenko

OPTIMUM PLASMA LENS FOR FOCUSSING OF HIGH-CURRENT ION BEAMS 152
A.A.Goncharov, V.I.Maslov, I.N.Onishchenko

ELECTRON SOURCES FOR PLASMA ELECTRONICS AND DIFFERENT TECHNOLOGICAL 155

APPLICATION

V.S. Antipov, I.A. Bez'yazyshny, I.V. Berezhnaya, E.A. Kornilov

- STATIONARY DYNAMICS OF NONLINEAR ELECTRON-CYCLOTRON WAVES AT THE PRESENCE OF RESONANT ELECTRONS** 158
H. Abbasi, H. Hakimi Pajouh

LOW TEMPERATURE PLASMA AND PLASMA TECHNOLOGIES

- APPLICATION OF ARC PLASMA FOR A DEPOSITION OF SUPERCONDUCTING FILMS** 161
J.Langner, R.Russo, L.Catani, S.Tazzari, M.Cirillo, K.Czaus, V.Merlo, F.Tazzioli, D.Proch, N.N.Koval, I.V.Lopatin
- CRITICAL ENERGY IN THE CYCLOTRON HEATING OF IONS IN AN ECR PLASMA SOURCE** 165
César Gutiérrez-Tapia, Omar Hernández-Aguirre
- DUSTY DISCHARGES WITH SECONDARY ELECTRON EMISSION** 168
Yu. I. Chutov, W.J. Goedheer, O.Yu. Kravchenko, O.A. Lavrov, R.Romanenko
- ION KINETICS IN AN ECR PLASMA SOURCE** 170
César Gutiérrez-Tapia
- APPLICATION OF PULSED PLASMA STREAMS FOR MATERIALS ALLOYING AND COATINGS MODIFICATION** 173
O.V. Byrka, A.N. Bandura, V.V. Chebotarev, I.E. Garkusha, J. Langner, M.J. Sadowski, V.I. Tereshin
- MODERNIZED TECHNOLOGICAL ACCELERATOR WITH ANODE LAYER FOR ION CLEANING** 176
Dobrovól's'kii A.N., Goncharov A.A., Pavlov S.N., Panchenko O.A., Protsenko I.M.
- INFLUENCE OF GAS MIXTURE WITH VARIOUS MASS NUMBERS OF GASES ON OPERATION PRESSURE RANGE OF PLASMA ELECTRON SOURCE WITH HOLLOW CATHODE** 179
V.N. Borisko, A.A. Petrushenya

PLASMA DIAGNOSTICS

- ELECTRON-BEAM-SHADOWGRAPH FOR THE STUDY OF THE STRONG TURBULENT PLASMA** 182
R. Ando, N. Okamoto, S. Shinojima, S. Wada, H. Fujii, T. Kondo, N. Toyosugi, K. Kamada
- MICROWAVE FLUCTUATION REFLECTOMETRY (A THEORETICAL VIEW)** 187
Gusakov E.Z., Popov A.Yu., Yakovlev B.O.
- LASER PROBING OF THE PLASMA IN THE S-300 FACILITY** 193
Yu.G. Kalinin, V.A. Korel'skii, E.V. Kravchenko, A.Yu. Shashkov
- ACCURACY OF ELECTROSTATIC ENERGY ANALYZER IN HIBP DIAGNOSTIC** 196
J.S.Bondarenko, A.A. Chmyga, M.B.Dreval, L. G. Eliseev, S.M.Khrebtev, A.D.Komarov, A.S.Kozachok, L.I.Krupnik, A.V.Melnikov, I.S. Nedzelskij
- OBSERVATION OF PLASMA POLOIDAL ROTATION IN "URAGAN-3M" TORSATRON FROM EDGE H_{α} FLUCTUATION CORRELATION STUDIES** 199
V.G.Konovalov, K.Matsuoka, O.S.Pavlichenko, A.N.Shapoval, A.I.Skibenko, C.Suzuki