

Contents

Advanced Plasma Physics in Linear Devices

Multi-Anode Photomultiplier Tube as a Tool for Spatio-Temporal Measurements in a Plasma	Ole WALDMANN and Werner BOHMEYER	1
Characteristics of Large Diameter, High-Density Helicon Plasma with Short Axial Length Using a Flat Spiral Antenna	Taisei MOTOMURA, Kenji TANAKA, Shunjiro SHINOHARA, Takao TANIKAWA and Konstantin P. SHAMRAI	6
Measurement of Ion Flow Velocity Field Associated with Plasma Hole Using Laser Induced Fluorescence Spectroscopy	Shinji YOSHIMURA, Atsushi OKAMOTO and Masayoshi Y. TANAKA	11
Effect of Plasma Rotation on Acceleration of Ions along the Magnetic Field Line	Kenichiro TERASAKA, Tetsushi KATAHIRA, Shinji YOSHIMURA, Mitsutoshi ARAMAKI and Masayoshi Y. TANAKA	15
Development of High Resolution LIF Spectroscopy with Saturated Absorption Spectrum	Shuzo ETOH, Mitsutoshi ARAMAKI, Kohei OGIWARA, Shinji YOSHIMURA and Masayoshi Y. TANAKA	20
Plasma Acceleration in a Compact Helicon Source Using RF Antennae	Kyoichiro TOKI, Shunjiro SHINOHARA, Takao TANIKAWA, Tohru HADA, Ikkoh FUNAKI, Kostiantyn P. SHAMRAI, Yoshikazu TANAKA and Akihiro YAMAGUCHI	25
Alfvén Waves in Multi-Component Plasmas	Kian RAHBARNIA, Stefan ULLRICH, Albrecht STARK, Olaf GRULKE and Thomas KLINGER	31
Alternative Fusion Reactors as Future Commercial Power Plants	Sergei V. RYZHKOV	35
Interaction of Helium Ion Beam with Argon Gas and Plasma	Atsushi OKAMOTO, Takehiro ISONO, Takashi KOBUCHI, Sumio KITAJIMA and Mamiko SASAO	39

Advance in Turbulence and Structure Formation Physics

Basic & Fusion Plasmas

Overview on Turbulence and Structure Formation during Resonant Magnetic Perturbations at TEXTOR	Andreas KRÄMER-FLECKEN, Yuhong XU, Sergey SOLDATOV, Marcin JAKUBOWSKI, Yungfeng LIANG, Dirk REISER and Oliver SCHMITZ	44
Reynolds Stress Measurements for Investigation of Nonlinear Processes of Turbulence in the Large Mirror Device and in the Large Mirror Device-Upgrade	Yoshihiko NAGASHIMA, Sanae-I. ITOH, Kimitaka ITOH, Akihide FUJISAWA, Shigeru INAGAKI, Yoshinobu KAWAI, Shunjiro SHINOHARA, Masayuki FUKAO, Takuma YAMADA, Kenichiro TERASAKA, Takashi MARUTA, Kunihiro KAMATAK, Hiroyuki ARAKAWA, Masatoshi YAGI, Naohiro KASUYA, George R. TYNNAN, Patrick H. DIAMOND and Yuichi TAKASE	50
Fast Heat Pulse Propagation by Turbulence Spreading.....	Volker NAULIN, Jens Juul RASMUSSEN, Paola MANTICA, Diego DEL-CASTILLO-NEGRET and JET-EFDA Contributors	55
Key Ideas for Heightening the Informativeness of Plasma Physical Theorizing	Vasily I. EROFEEV	59
Electron Acceleration by Oscillating Electric Field	Akira TSUSHIMA and Osamu ISHIHARA	65
Nonlinear Dynamics of Magnetic Drift Modes and Self-Organization Phenomena in Turbulent Unmagnetized Plasma	Vladimir P. PAVLENKO	69
Hall Effects on Local Structures in DecayingMHD Turbulence.....	Hideaki MIURA and Dan. HORI	73
Analyses of Nonlinear Coupling for Turbulent Structural Formation in Magnetized Cylindrical Plasmas	Naohiro KASUYA, Masatoshi YAGI, Kimitaka ITOH and Sanae-I. ITOH	77
Dynamics of Drift and Flute Modes in Linear Cylindrical ECR Plasma.....	Kunihiro KAMATAKI, Sanae-I. ITOH, Yoshihiko NAGASHIMA, Shigeru INAGAKI, Shunjiro SHINOHARA, Masatoshi YAGI, Takuma YAMADA, Yoshinobu KAWAI, Akihide FUJISAWA and Kimitaka ITOH	82
Measurement of Nonlinear Mode Couplings in the Large Mirror Device-Upgrade	Takuma YAMADA, Sanae-I. ITOH, Shigeru INAGAKI, Yoshihiko NAGASHIMA, Shunjiro SHINOHARA, Takashi MARUTA, Kenichiro TERASAKA, Kunihiro KAMATAKI, Naohiro KASUYA, Masatoshi YAGI, Yoshinobu KAWAI, Akihide FUJISAWA and Kimitaka ITOH	87
Experimental Synchronization in Coupled Spatially Extended Systems	Takao FUKUYAMA, Yoichi WATANABE and Yoshinobu KAWAI	91
Orthonormal Divergence-Free Wavelet Analysis of Energy Transfer in Magnetohydrodynamic Turbulence	Keisuke ARAKI and Hideaki MIURA	96
Non-Inductive Formation of Spherical Tokamak Plasmas by ECH on CPD	Tomokazu YOSHINAGA, Kazuaki HANADA, Kohnosuke SATO, Hideki ZUSHI, Kazuo NAKAMURA, Hiroshi IDEI, Mizuki SAKAMOTO, Yousuke NAKASHIMA, Makoto HASEGAWA, Yuta HIGASHIZONO, Shoji KAWASAKI, Hisatoshi NAKASHIMA, Aki HIGASHIJIMA, Rajendraprasad BHATTACHARYAY, Kosuke DONO, Hiroshi HONMA, Masaki ISHIGURO, Takashi SAKIMURA, Tomofumi RYOKAI and Toshimasa MIYAZAKI	100
Field Line Tying and Magnetic Shear Effects of the Vertical Magnetic Field on Low Frequency Density Fluctuations in CPD	Tomofumi RYOKAI, Hideki ZUSHI, Rajendraprasad BHATTACHARYAY, Hiroshi IDEI, Tomokazu YOSHINAGA, CPD Group 1, Tomohiro MORISAKI, Takashi MUTOH, Shin KUBO, Kazuaki NAGASAKI	105
Two-Dimensional Numerical Simulation of Microwave Imaging Reflectometry	Zhongbing SHI, Yoshio NAGAYAMA, Daisuke KUWAHARA, Tomokazu YOSHINAGA, Masaharu SUGITO, Soichiro YAMAGUCHI	109
On the Observation of ETG-Scale Turbulence on HT-7 Tokamak	Tao ZHANG, Yadong LI, Shiyao LIN, Xiang GAO, Junyu ZHAO, Qiang XU	115

Seesaw Mechanism in Turbulence-Suppression by Zonal Flows	Kimitaka ITOH, Sanae-I. ITOH, Masatoshi YAGI, Atsushi FUKUYAMA	119
Multi-Scale Interaction between MHD, Turbulence and Transport in Tokamak Plasmas	Masatoshi YAGI, Sanae-I. ITOH, Shinsuke TOKUNAGA, Seiya NISHIMURA and Kimitaka ITOH	122
Fusion Modeling in Vlasov-Like Models	Antonina N. FEDOROVA and Michael G. ZEITLIN	126
Space & Astro Plasmas		
Cosmic Rays in the Dynamic Heliosphere	Marius S. POTGIETER	132
Multiscale Multifractal Intermittent Turbulence in Space Plasmas	Wiesław M. MACEK, Anna WAWRZASZEK and Tohru HADA	142
Effects of Small Wavenumber Alfvén Waves on Particle Acceleration	Hiroshi OHNO	148
Role of the Turbulent Magnetic Helicity in the Non-Linear Behavior of Solar Dynamo	Irina KITIASHVILI and Alexander KOSOVICHEV	153

Laboratory-Space-Astrophysical Plasma Interrelation

Laboratory Plasmas

Stability and Nonlinear Dynamics Aspects of a Model for Collisionless Magnetic Reconnection	Emanuele TASSI, Daniela GRASSO, Francesco PEGORARO and P.J. MORRISON	159
Characteristics of the Cyclotron Harmonic Resonances Found by Impedance Probe Experiments in a Laboratory Plasma	Tomonori SUZUKI, Takayuki ONO, Masahide IIZIMA, Makoto WAKABAYASHI and Atsushi KUMAMOTO	165
Depolarization of Excited Ne*(2p ³ 3p; J=1) Atoms Due to He Atom Collisions	Hiraku MATSUKUMA, Cristian BAHRIM and Masahiro HASUO	169
Planned for High Energy Density Physics Based on All Ion Accelerator Facility	Toru SASAKI, Tomohiko ASAI, Tsutomu TAKAHASHI, Takashi KIKUCHI, Mitsuo NAKAJIMA, Kazuhiko HORIOKA and Ken TAKAYAMA	174

Space & Astro Plasmas

Diagnostics of Plasma Dynamics and Magnetism inside the Sun by Helioseismology	Alexander G. KOSOVICHEV	179
Numerical Simulation of Collisionless Driven Reconnection Controlled by Multi-Scale Physics in Open Systems	Ritoku HORIUCHI, Shunsuke USAMI, Hiroaki OHTANI and Mitsue DEN	184
Dark Solitons in Gravitational Wave and Pulsar Plasma Interaction	U.A. MOFIZ	189
Proton-Induced Nonthermal Nuclear Effects in the Early Universe Plasma	Victor T. VORONCHEV, Yasuyuki NAKAO and Makoto NAKAMURA	194
Some Physical Mechanisms of Precursors to Earthquakes	James W. VAN DAM, Wendell HORTON, Nodar L. TSINTSADZE, Tamaz D. KALADZE, Trevor W. GARNER and L.V. TSAMALASHVILI	199
Energy Conversion in Magnetic Reconnection with Chaos Diffusion	Hiroaki OHTANI, Wendell HORTON, Tomio PETROSKY and Ritoku HORIUCHI	203
Observations of High Energy Gamma-Rays from Winter Thunderclouds	T. ENOTO, H. TSUCHIYA, T. YUASA, S. YAMADA, H. KATO, M. KAWAHARADA, T. KITAGUCHI, M. KOKUBUN, M. OKANO, S. NAKAMURA, K. NAKAZAWA and K. MAKISHIMA	208
Fast Magnetic Reconnection Associated with Kink Modes	Keizo FUJIMOTO and Richard D. SYDORA	212
Stabilization of Electromagnetic Ion Beam Instabilities by Finite Amplitude Alfvén Waves Revisited	Yasuhiro NARIYUKI	217
Geomagnetic Storms in Relation with Halo and Partial Halo Coronal Mass Ejections and Disturbances in Solar Wind Plasma Parameters	P.L. VERMA, A.K. TRIPATHI and Sushil SHARMA	221
Large Geomagnetic Storms in Relation to CME Related Shocks and Magnetic Clouds	P.L. VERMA, R.S. GUPTA and P.K. CHAMADIA	226
Repeated Interactions of Thermal Ions with an Oblique Shock Wave	Mieko TOIDA, Ryohei HONMA and Yukiharu OHSAWA	230
Theory and Simulations of Parallel Electric Fields in Nonlinear Magnetosonic Waves: Two-Component Plasma	Yukiharu OHSAWA and Seiichi TAKAHASHI	234
Theory and Simulations of Parallel Electric Fields in Nonlinear Magnetosonic Waves: Three-Component Plasma	Seiichi TAKAHASHI and Yukiharu OHSAWA	238
Simulation Studies of Electron Acceleration to Ultrarelativistic Energies Caused by Small Pulses Generated in Shock Waves	Masatoshi SATO and Yukiharu OHSAWA	242
Extension of the Sweet-Parker Magnetic Reconnection to the Relativistic Plasma	Hiroyuki R. TAKAHASHI, Tomoyuki HANAWA and Ryoji MATSUMOTO	246
Excitation of HF and ULF-VLF Waves during Charged Particle Beams Injection in Active Space Experiment	Nikolay V. BARANETS, Yackov P. SOBOLEV, Yuriy Ya. RUZHIN, Hanna ROTHKAEHL, Nikolay S. EROKHIN, Valeriy V. AFONIN, Jaroslav VOJTA and Jan SMILAUER	251

Frontiers of Dust Plasmas

Basic Plasmas

Phase Diagram of Strongly Coupled Yukawa Particulates in Deformable Background and Application to Fine Particle (Dusty) Plasmas	Hiroo TOTSUJI	257
Solitary Waves of the Kadomtsev-Petviashvili Equation in Warm Dusty Plasma with Variable Dust Charge, Two Temperature Ion and Nonthermal Electron	Hamid Reza PAKZAD	261
Charging of Dust in the Presence of a Directed Photon Flux: Numerical Simulations	Wojciech J. MIŁOCH, Sergey V. VLADIMIROV, Hans L. PÉCSELI and Jan TRULSEN	265
Self-Excited Irregular Oscillation of Positively Charged Fine-Particles in Magnetized Double Plasmas	Satoru IIZUKA and Takuma GOHDA	269

Charging of Dust Particles in Magnetic Field	Yukihiro TOMITA, Gakushi KAWAMURA, Takatoshi YAMADA and Osamu ISHIHARA	273
Ambipolar Diffusion in Laboratory and Ionospheric Dusty Plasmas	T.V. LOSSEVA, S.I. POPEL, M.Y. YU and J.X. MA	277
Dust Cluster Oscillation Spectrum in the Presence of Charge Fluctuations	Vanessa MOSS, Alex A. SAMARIAN and Sergey V. VLADIMIROV	282
Coulomb Cluster in a Plasma under Cryogenic Environment	Jumpei KUBOTA, Chikara KOJIMA, Wataru SEKINE and Osamu ISHIHARA	286
Dust Dynamics in Cryogenic Environment	Wataru SEKINE, Osamu ISHIHARA and Marlene ROSENBERG	290
Dust Charge in Collisional Plasma in Liquid Helium Vapor	Masako SHINDO, Natsuko UOTANI and Osamu ISHIHARA	294
Behaviors of Fine Particles in a Planar Magnetron Plasma	Yasuaki HAYASHI, Yohei MIZOBATA and Kazuo TAKAHASHI	298
Space & Application Plasmas		
On the Formation of Plasma Structures in Our Magnetized Dusty Universe	Padma K. SHUKLA and Gregor E. MORFILL	302
DNLS Solitons in Collisional Dusty Plasma	Birendra P. PANDEY, Sergey V. VLADIMIROV and Alex A. SAMARIAN	305
A Comparison of Dust Particles Produced Due to Interaction between Graphite and Plasmas: LHD vs Helicon Discharges	Shinya IWASHITA, Hiroshi MIYATA, Kazunori KOGA, Masaharu SHIRATANI, Naoko ASHIKAWA, Kiyohiko NISHIMURA, Akio SAGARA and LHD Experimental Group	308
Macrospin of the Dust Granule	Viktor Yu. KARASEV, Elena S. DZLIEVA, Aleksey I. EIKHVAL'D, Maksim A. ERMOLENKO, Maksim S. GOLUBEV and Artem Yu. IVANOV	312

ITER-Driven Plasma Physics

Toroidal Rotation Profiles under the Influence of Fast-Ion Losses Due to Toroidal Field Ripple	Mitsuru HONDA, Tomonori TAKIZUKA, Atsushi FUKUYAMA, Maiko YOSHIDA and Takahisa OZEKI	316
Modeling of Erosion and Deposition of ITER Limiters during Ramp Phases	A. KIRSCHNER, D. BORODIN, V. PHILIPPS, U. SAMM, A. LOARTE and G. FEDERICI	321
Excitation and Suppression of Alfvén Eigenmodes (AEs) by Using DED Coils	Tatsuo SHOJI, Akira TSUSHIMA, Yusuke KIKUCHI, Kazuo TOI, Karl H. FINKEN, Michael LEHNEN and Oliver ZIMMERMANN	326
Lorentz Alpha Orbit Calculation in Search of Position Suitable for Escaping Alpha Particle Diagnostics in ITER	Mitsutaka ISOBE, Dan FUNAKI and Mamiko SASAO	330
Development of the Microfission Chamber for Fusion Power Diagnostics on ITER	Masao ISHIKAWA, Takashi KONDOH, Takeo NISHITANI and Yoshinori KUSAMA	334
Impurity Behavior in ITER and Helical Burning Plasmas with Internal Transport Barriers	Kozo YAMAZAKI, Ikuhiro YAMADA, Tetsutarou OISHI, Hideki ARIMOTO and Tatsuo SHOJI	338
Pellet and Gas-Puff Fueling Simulation in ITER and Power Plant Plasmas Using "TOTAL" Code	Tetsutarou OISHI, Kozo YAMAZAKI, Hiroaki YAMAMOTO, Hideki ARIMOTO and Tatsuo SHOJI	342
ITER Performance Study with the Presence of Internal Transport Barrier	Thawatchai ONJUN	347
My Advice to ITER-Driven Plasma Physics	Hong LIU	353

Edge Plasma Physics and Materials Interaction

Basic Plasmas

Gradient-Length Analysis of the Magnetized Plasma-Wall Transition (MPWT)	Fatima BINT-E-MUNIR, Siegbert KUHN and Davy D. TSKHAKAYA (sr)	357
Electric Potential in a Magnetized Plasma with Magnetic Field Increasing toward a Wall	Azusa FUKANO and Akiyoshi HATAYAMA	362
Carbon Erosion under Heavy Atomic Hydrogen Irradiation	Yuji TAKEGUCHI, Masaaki KYO, Yoshihiko UESUGI, Yasunori TANAKA and Suguru MASUZAKI	366
Carbon Dust Formation under Heavy Atomic Hydrogen Irradiation	Masaaki KYO, Yuji TAKEGUCHI, Yoshihiko UESUGI, Yasunori TANAKA and Suguru MASUZAKI	371
Collector Floating Potentials in a Discharge Plasma with Two Species of Positive Ions	Milan ČERČEK, Tomaž GYERGYEK and Gregor FILIPIČ	376
Electric and Spectroscopic Characterization of Magnetized Hydrogen and Helium Hot Cathode Discharge Plasma	Milan ČERČEK, Tomaž GYERGYEK, Boris FONDA, Codrina IONIȚĂ and Roman SCHRITTWIESER	381
Dust in Flowing Magnetized Plasma	Birendra P. PANDEY, Alex A. SAMARIAN and Sergey V. VLADIMIROV	385
Observation of $H_2 I^1\Pi_g^{+-}-B^1\Sigma_u^+$ Band Spectra in a Hollow-Cathode Glow Discharge	Taiichi SHIKAMA and Shinichiro KADO	389
Modeling of the Interaction between Electrons and Neutral Excited Atoms during ELM Burst	Junpei INAMORI, Ikuro FUJINO and Akiyoshi HATAYAMA	394

Fusion Plasmas

A Wavelet-Based Method to Measure the Toroidal Mode Number of ELMs	Francesca M. Poli, Sergei E. Sharapov and JET-EFDA Contributors	399
First-Principle Study on Binding Energy of Vacancy-Hydrogen Cluster in Tungsten	Daiji KATO, Hirotomo IWAKIRI and Kazunori MORISHITA	404
Effects of Resonant Magnetic Perturbations on the Dynamics of Edge Transport Barriers	Michael LECONTE, Peter BEYER, Xavier GARBET and Sadruddin BENKADDA	408
Simultaneous Measurements of Electrostatic and Magnetic Fluctuations in ASDEX Upgrade Edge Plasma	Codrina IONITA, Nicola VIANELLO, Hans W. MÜLLER, Franz MEHLMANN, Matteo ZUIN, Volker NAULIN, Jens J. RASMUSSEN, Volker ROHDE, Roberto CAVAZZANA, Catalin LUPU, Marc MARASCHEK, Roman W. SCHRITTWIESER, Petru C. BALAN and ASDEX Upgrade Team	413

Transport of Heavy Hydrocarbon and Its Redeposition on Plasma Facing Walls	
.....Kaoru OHYA, Kensuke INAI, Yasuyuki KIKUHARA, Tomohide NAKANO, Jun KAWATA, Hayato KAWAZOME, Yoshio UEDA and Tetsuo TANABE	419
Analysis for Surface Probes Prepared 10th Experimental Campaign of LHD	
.....H. YAGIHASHI, T. HIRATA, N. ASHIKAWA, T. HINO, Y. YAMAUCHI, Y. NOBUTA, S. MASUZAKI, K. NISHIMURA, A. SAGARA, N. OYABU, A. KOMORI and O. MOTOJIMA	425
Experimental Observation of Plasma Flow Alternation in the LHD Stochastic Magnetic Boundary	
.....Naomichi EZUMI, Tomoyuki KOBAYASHI, Noriyasu OHNO, Keiji SAWADA, Shuichi TAKAMURA, Masahiro KOBAYASHI, Suguru MASUZAKI and Yuehe FENG	429
An EDDY-PIC Simulation of Co-Deposition of Hydrogen Isotopes on a Castellated Structure of Plasma Facing Tiles	
.....Kensuke INAI, Kaoru OHYA, Gakushi KAWAMURA and Yukihiko TOMITA	433
Molecular Dynamics Study on Behavior of Hydrocarbon Molecules in Hydrogen Atom Gas	
.....Atsushi ITO and Hiroaki NAKAMURA	438
Effect of Surface Structure upon Particles Reflection Coefficients and Sputtering Yields	
.....Takahiro KENMOTSU, Motoi WADA, Hitoshi YAMAOKA, Masaki NISHIURA and Katsuyoshi TSUMORI	442
Edge Biasing of SINP-TOKAMAK Plasma in High-q Regime	
.....Debjoyti BASU and R. PAL	446
3D Monte Carlo Simulation for H-Alpha Spectra Observed in Compact Helical Systems	
.....Hiroto MATSUURA, Ken NAKANO, Shin NISHIMURA, Mamoru SHOJI, Chihiro SUZUKI and Shoichi OKAMURA	450
1D Fluid Model of Plasma Profiles in the LHD Divertor Leg	
.....Gakushi KAWAMURA, Yukihiko TOMITA, Masahiro KOBAYASHI and David TSKHAKAYA	455

Plasma Optics and Photonics

Proton Acceleration by High-Intensity UV Laser Irradiation with Thin Foil Targets	
.....Eiichi TAKAHASHI, Susumu KATO, Yuji MATSUMOTO and Isao OKUDA	460
Observation of UV Harmonics from a Thin-Foil Target in the High-Intensity Laser-Driven Proton Generation	
.....Akito SAGISAKA, Alexander S. PIROZHKOV, Jinglong MA, Michiaki MORI, Akifumi YOGO, Koichi OGURA, Satoshi ORIMO, Mamiko NISHIUCHI, Hiromitsu KIRIYAMA, Shuhei KANAZAWA, Shuji KONDO, Yoshiki NAKAI, Takuya SHIMOMURA, Manabu TANOUE, Atsushi AKUTSU, Hajime OKADA, Tomohiro MOTOMURA, Tetsuya KAWACHI, Hiroyuki DAIDO, Sergei V. BULANOV, Timur Zh. ESIRKEPOV and Hideo NAGATOMO	464
Acceleration of Relativistic Electron Beam Trapped in Extraordinary Beat Wave	
.....Reiji SUGAYA and Tsunehiro MAEHARA	468
Simulation of Electron Beam Acceleration by Electromagnetic Field in Static Inhomogeneous Magnetic Field	
.....Valeriy D. DUGAR-ZHABON and Eduardo A. OROZCO	473
Electromagnetic-Wave Transmittance Characteristics in One-Dimensional Plasma Photonic Crystals	
.....Hitoshi HOJO and Atsushi MASE	477
Dynamic Behavior of Debris in a Gas-Puff Z-Pinch	
.....Keiichi TAKASUGI and Akiko MAEDA	480
Gas-Puff Design and Hot Spot Formation in a Z-Pinch Plasma	
.....Keiichi TAKASUGI, Tomomi OSHIMA and Mineo NISHIO	484
Collective Thomson Scattering Diagnostics of EUV Plasmas	
.....Kentaro TOMITA, Taisuke KAGAWA, Kiichiro UCHINO, Sunao KATSUKI and Hidenori AKIYAMA	488
ECR Heating of Laser Produced Sn Plasma for Drift Control in B Field	
.....Takashi SUGANUMA, Yoshifumi UENO, Hiroshi KOMORI, Akira ENDO and Akira SUMITANI	492
Imaging Diagnostics of Debris from Double Pulse Laser-Produced Tin Plasma for EUV Light Source	
.....Tomoya AKIYAMA, Kota OKAZAKI, Daisuke NAKAMURA, Akihiko TAKAHASHI and Tatsuo OKADA	496

Bio/Nanotechnology Frontiers

Nanotechnology	
In-Flight Microplasma Synthesis of Luminescent Silicon Nanocrystals	
.....Tomohiro NOZAKI, Takashi NAKAMURA, Masaki SAGAWA and Ken OKAZAKI	500
Magnetic CoPt Nanoparticles Deposition Using Plasma Focus Device	
.....Z.Y. PAN, R.S. RAWAT, J.J. LIN, R. VERMA, M.V. ROSHAN, P. LEE, S.V. SPRINGHAM, T.L. TAN, T. ZHANG and R.V. RAMANUJAN	504
Generation of Electron Cyclotron Resonance Plasmas Including Iron-Atom for Synthesis of Iron Endohedral Fullerenes	
.....Go YOKOKURA, Hiroyasu ISHIDA, Toshiro KANEKO and Rikizo HATAKEYAMA	508
Plasma Route to Nanosciences and Nanotechnology Frontiers	
.....M.P. SRIVASTAVA	512
Effects of Gas Ion Density on Formation of Gas-Atom Encapsulated Silicon Fullerenes	
.....Masahiro YABUNO, Toshiro KANEKO and Rikizo HATAKEYAMA	517
Carbon Nanotube Formation Directly on the Surface of Stainless Steel Materials by Plasma-Assisted Chemical Vapor Deposition	
.....Satoshi SUGIMOTO, Yasushi MATSUDA and Hideo MORI	522
Nanoparticles and Nanostructured Cobalt Deposition Using Dense Plasma Focus Device and their Characterization	
.....W.P. SINGH, M.P. SRIVASTAVA and Savita ROY	526
Formation of Azafullerene Encapsulated Single-Walled Carbon Nanotubes Using Plasma Ion Irradiation Method	
.....Yohei HANABUSA, Toshiro KANEKO and Rikizo HATAKEYAMA	530
Creation of Functional Double-Walled Carbon Nanotubes by Plasma Processing	
.....Yongfeng LI, Toshiro KANEKO and Rikizo HATAKEYAMA	534
Characteristics of 100 nm-Dot Array of Vertically Aligned Carbon Nanotube Field Emitters Fabricated by DC Plasma Enhanced Chemical Vapor Deposition	
.....Takafumi MATSUDA, Jun SATO, Akihisa OGINO and Masaaki NAGATSU	539

Low Temperature Growth of Carbon Nano-Materials on Different Catalysts by the Surface-Wave Plasma Technique.....Di LU, Akihisa OGINO, Takafumi MATSUDA, Qiang MA and Masaaki NAGATSU	544
Biotechnology	
Intracellular DNA Damage Induced by Intense Burst Sinusoidal Electric FieldsNaoyuki NOMURA, Masahiko YANO, Sunao KATSUKI, Hidenori AKIYAMA, Keisuke ABE and Shin-Ichi ABE	548
Treatment of Protein Using Oxygen Plasma Produced by RF DischargeNobuya HAYASHI, Ryutaro KAWAGUCHI and Hao LIU	552
Improvement of Edible Mushroom Yield by Electric StimulationsKoichi TAKAKI, Nobuyuki YAMAZAKI, Seiji MUKAIGAWA, Tamiya FUJIWARA, Hisayoshi KOFUJITA, Kyusuke TAKAHASI, Maki NARIMATSU and Kenichi NAGANE	556
Sterilization Efficiency of Inactivation Factors in a Microwave Plasma DeviceMrityunjai K. SINGH, Akihisa OGINO, Masaaki NAGATSU and Lei XU	560
Generation Technique and Sterilization Application of Microwave-Excited Plasma inside a Medical ContainerLei XU, Yuya FUJIOKA, Akihisa OGINO and Masaaki NAGATSU	564
Sterilization of Tubular Medical Instruments Using Wire-Type Dielectric Barrier DischargeHiroyuki ETO, Yoshihito ONO, Akihisa OGINO and Masaaki NAGATSU	568
Influence of Calcium Hydroxide Solution in RF Plasma on Sterilization of Bacterial SporesWeimin GUAN, Hiroharu KAWASAKI, Tamiko OHSHIMA, Yoshihito YAGYU, Toshinobu SHIGEMATSU, Yoshiaki SUDA and Nobuya HAYASHI	573
Influence of Atomic and Singlet Molecular Oxygen Generated by RF Plasma on Reduction of ProteinYoshihito YAGYU, Nobuya HAYASHI, Weimin GUAN, Hiroharu KAWASAKI, Tamiko OHSHIMA and Yoshiaki SUDA	578
Control of Three Dimensional Transport of Nano-Blocks by Amplitude Modulated Pulse RF Discharges Using an Electrode with NeedlesShinya IWASHITA, Hiroshi MIYATA, Hidefumi MATSUZAKI, Kazunori KOGA and Masaharu SHIRATANI	582
Comparison of Plasma Parameters in CCP and ICP Processes Appropriate for Carbon Nanotube GrowthYohei SAKAMOTO, Shuichi MAENO, Nobuteru TSUBOUCHI, Toshiro KASUYA and Motoi WADA	587
Characterization of Carbon Nanofibers Synthesized by Using the Well-Controlled Thermal PlasmasYuichi YOSHIHARA, Kazuki AKIMOTO, Tsuyoshi OHISHI, Satoru FUJIMOTO, Wataru OOHARA and Osamu FUKUMASA	591
Effect of Gold Catalytic Layer Thickness on Growth of Single-Walled Carbon Nanotubes Using Thermal and Plasma CVDZohreh GHORANNEVIS, Toshiaki KATO, Toshiro KANEKO and Rikizo HATAKEYAMA	595
The Crystalization of Carbon Nanotubes in Liquid HeliumT. SHIGEMATSU, H. KAWASAKI, Y. JOHNO, T. OHSHIMA, Y. YAGYUU, W.M. GUAN and Y. SUDA	599

Plasmas with Gas/Liquid Interfaces

Enhancement of Microplasma Generated in Water by Adding Carbon NanotubesUsama KHALED, Kiminobu IMASAKA and Junya SUEHIRO	603
Change in Spectrum of Ionic Liquids Exposed to 2.45 GHz Surface Wave PlasmasMakoto MIYAGISHI, Akihiko IRIE, Haruhiko HIMURA, Sadao MASAMUNE, Akio SANPEI, Noriyuki HASUIKE, Nobuyuki ICHINOSE and Takashi WAKASUGI	608
An Underwater Arc Discharge Method of CNT Production Using Carbon Electrode Physical VibrationYoung-II KIM, Eiichi NISHIKAWA and Toshihide KIOKA	612
Time Resolved Imaging of Pulsed Streamer Discharge at the Air/Water InterfaceSeiji KANAZAWA, Michihiko HIRAO, Marek KOCIK and Jerzy MIZERACZYK	615
Property of Laser-Induced Plasma in Liquid.....Norio TSUDA, Tsuyoshi YAMAGUCHI and Jun YAMADA	619
Ozone Generation Using Micro Barrier Discharge in Water.....Tatsuya SAKODA, Yoshihisa MATSUDA and Seiji BABA	623
Effect of the Temperature of Water on the Degradation of Methylene Blue by the Generation of Radio Frequency Plasma in Water.....Ippei MIYAMOTO, Tsunehiro MAEHARA, Hiroshi MIYAOKA, Shingo ONISHI, Shinobu MUKASA, Hiromichi TOYOTA, Makoto KURAMOTO, Shinfuku NOMURA and Ayato KAWASHIMA	627

Plasma Diagnostics

Basic & Fusion Plasmas

A Radially Movable Laser-Heated Emissive ProbeRoman W. SCHRITTWIESER, Ronald STÄRZ, Codrina IONITA, Ramona GSTREIN, Thomas WINDISCH, Olaf GRULKE and Thomas KLINGER	632
The Role of Higher Diffraction Order to Determine Ion Temperature in Vacuum Ultraviolet Region Using Multichannel Detector.....Munemasa MACHIDA, Bruno S. ARSIOLI, Felipe DO NASCIMENTO, André M. DALTRINI, José H.F. SEVERO and Ivan C. NASCIMENTO	636
Status of Two-Dimensional Ion Velocity Measurement System in NSTXN. NISHINO, S. PAUL, R. KAITA and A.L. ROQUEMORE	640
Observation of Radial Displacement of Translated Field Reversed Configuration Plasma Using Computer Tomography at Two Different Cross Sections.....Satoru YOSHIMURA and Shigefumi OKADA	645
Development of 2-D Antenna Array for Microwave Imaging Reflectometry in LHDDaisuke KUWAHARA, Shunji TSUJI-IIO, Yoshio NAGAYAMA, Tomokazu YOSHINAGA, Masaharu SUGITO, Zhongbing SHI, Soichiro YAMAGUCHI, Yuichiro KOGI and Atsushi MASE	649
Installation of Bidirectional Lost Fast-Ion Probe in the Large Helical DeviceKunihiro OGAWA, Mitsutaka ISOBE and Kazuo TOI	655

Advantages of High Temperature Operation of an Imaging Bolometer	
.....Evgeny A. DRAPIKO, Byron J. PETERSON, Junichi KODAIRA and Naoko ASHIKAWA	659
Use of γ -Ray-Generating ${}^6\text{Li}+\text{D}$ Reaction for Fast-Ion Diagnostics in Deuterium Plasmas	
.....Shusaku HIRAYAMA, Hideaki MATSUURA and Yasuyuki NAKAO	662
Measurement of DT and DD Neutrons with a TOF Spectrometer for Determination of Fuel Ion Density Ratio in ITER	
.....K. OKADA, K. KONDO, K. OCHIAI, S. SATO, C. KONNO, A. OKAMOTO, T. KOBUCHI, S. KITAJIMA and M. SASAO	666
On-Demand Density Correction Using Steady-State Plasmas in the LHD Thomson Scattering	
.....Ichihiko YAMADA, Kazumichi NARIHARA, Takashi MINAMI, Hisamichi FUNABA, Hiroshi HAYASHI, Toshikazu KOHMOTO and LHD Experimental Group	670
Evaluation of 25 keV Helium Hydrogen Ion Beam for Alpha Particle Measurement in ITER	
.....Hajime SAKAKITA, Satoru KIYAMA, Haruhisa KOGUCHI, Yoichi HIRANO, Toshio SHIMADA, Mamiko SASAO, Atsushi OKAMOTO, Takashi KOBUCHI and Katsuhiko SHINTO	674
Development of Polarization Interferometer for Thomson Scattering Diagnostics in JT-60U	
.....Takaki HATAE, John HOWARD, Noboru EBIZUKA, Youich HIRANO, Haruhisa KOGUCHI, Shigeru KITAMURA, Takeshi SAKUMA and Takashi HAMANO	680
Instability Analysis in Aditya Tokamak Discharges with the Help of Soft X-Ray	
.....Asim Kumar CHATTOPADHYAY and Aditya Team	685
Hopfield Neural Network for Plasma Image Reconstruction in Application to a Bolometer Camera System of LHD	
.....Naofumi IWAMA, Noriyuki ICHIKAWA, Yohsuke HOSODA, Yi LIU, Naoki TAMURA, Byron J. PETERSON and Artem Yu. KOSTRYUKOV	691
Application Plasmas	
Laser Thomson Scattering Diagnostics of Dielectric Barrier Discharge Plasmas	
.....Yasushi SONODA, Shuhei NISHIMOTO, Kentaro TOMITA, Safwat HASSABALLA, Yukihiko YAMAGATA and Kiichiro UCHINO	696
Detection of Nano-Particles Formed in CVD Plasmas Using a Two-Dimensional Photon-Counting Laser-Light-Scattering Method.....	
Hiroomi MIYAHARA, Shinya IWASHITA, Hiroshi MIYATA, Hidefumi MATSUZAKI, Kazunori KOGA and Masaharu SHIRATANI	700
Growth of Neutral Species in the Downstream Region of Perfluorocarbon Plasmas	
.....Hiroshi OKUMURA, Kenji FURUYA and Akira HARATA	705
Electron Temperature and Density Measurement of Cylindrical Parallel MCS Discharge Plasma in Atmospheric pressure	
.....M. MAEYAMA, Y. AKASHI and K. NAGANO	711
A Magneto-Plasma-Dynamic Arcjet (MPDA) Plasma Density Measurements by Using Multi-Reflection Type He-Ne Laser Interferometer.....	
Kunihiko HATTORI, Akira ANDO and Masaaki INUTAKE	715
A Study of the Ion Flux during Deposition of Titanium Thin Films by Hollow Cathode Plasma Jet	
.....Petr VIROSTKO, Zdenek HUBICKA, Martin CADA, Stepan KMENT, Lubomir JASTRABIK and Milan TICHY	719
Spatial Characterization of the Plasma Density in a Magnetically Expanding Plasma Using Permanent Magnets	
.....Tomoyo SASAKI, Kazunori TAKAHASHI, Kaoru OGUNI and Tamiya FUJIWARA	724
Dynamic Behavior of Hydrogen and Nitrogen Radicals in Pulse Modulated Induction Thermal Plasmas	
.....Tomoyuki ITO, Yasunori TANAKA, Kohei HAYASHI and Yoshihiko UESUGI	728
Investigation on Spatial Temperature Decay of Thermal Plasma with Polymer Ablation.....	
Toshiaki SAKUYAMA, Kazuhiro AMITANI, Yasunori TANAKA, Yoshihiko UESUGI, Shuhei KANEKO and Shigemitsu OKABE	732
Optical Emission Spectroscopy of a Magnetically Enhanced Multi-Hollow Discharge Plasma for a-Si:H Deposition	
.....William M. NAKAMURA, Yuuki KAWASHIMA, Masatoshi TANAKA, Hiroshi SATO, Jun UMETSU, Hiroomi MIYAHARA, Hidefumi MATSUZAKI, Kazunori KOGA and Masaharu SHIRATANI	736
Spectroscopic Analysis of Nitrogen Atmospheric Plasma Jet	
.....Yuusuke KUBOTA, Ryuta ICHIKI, Tamio HARA, Naohiro YAMAGUCHI and Yuichiro TAKEMURA	740
Plasma Production and Characterization	
Electrical Breakdown in Gases via a New Mechanism of Avalanche and Streamer Multiplications.....	
Tomáš FICKER	744
Dynamics of Fireballs.....	
Codrina IONITA, Roman W. SCHRITTWIESER and Reiner STENZEL	750
Ion Current Oscillations and Performances Based on the Cross-Field Ion Transport Model in Hall Thrusters	
.....Yuki YAMAMURA, YasuNori NEJOH and Hirokazu TAHARA	755
Stability of N_2 Plasmas in an Aluminum Made Planar Magnetron Device	
.....Jiro MAEDA, Toshiro KASUYA, Yasuyuki KIMURA, Takahiro KENMOTSU, Shuichi MAENO and Motoi WADA	760
Production of a Narrow Magnetized Plasma by a High Temperature Cathode	
.....Shinsuke IMAKITA, Toshiro KASUYA, Naoki MIYAMOTO, Satoshi SHIMAMOTO and Motoi WADA	764
Numerical Study on the Gas Temperature of Microwave Discharge Rare Gas Plasmas as a Rarefied Gas Dynamic System	
.....Takahiko ICHIKI, Takeshi SAKAMOTO, Haruaki MATSUURA and Hiroshi AKATSUKA	768
Investigation on the Cross-Field Ion Transport on the Discharge Current Oscillation and Performances of SPT-100 Type Hall Thrusters.....	
Yasunori NEJOH, Hiroyuki NAKAMOTO and Hirokazu TAHARA	773
Electro-Explosive Mechanism of Carbon Cathode Destruction in Negative Corona Discharge in Trichel Pulse Regime	
.....Alexey A. PETROV, Ravil H. AMIROV, Erik I. ASINOVSKII and Igor S. SAMOYLOV	780
Production and Control of VHF Excited Plasmas by Superposing Two Standing Waves	
.....Toshiki YOSHIOKA, Yasushi TAUCHI, Wataru OOHARA, Osamu FUKUMASA and Masayoshi MURATA	784
Relationship between Production and Extraction of D^-/H^- Negative Ions in a Volume Negative Ion Source	
.....Takahiro NAKANO, Shigefumi MORI, Yasushi TAUCHI, Wataru OOHARA and Osamu FUKUMASA	789

Numerical Study on Discharge Characteristics of a Line-Shaped Microwave Plasma with a Rectangular Slotted Waveguide	Akihiro TSUJI, Yasuyoshi YASAKA, Hiromasa TAKENO, Takayuki FUKASAWA and Shuitsu FUJII	794
Study on Wave Mode Control in Slot-Excited Microwave Plasmas	Hiroshi SHONO, Yasuyoshi YASAKA, Akihiro TSUJI and Hiromasa TAKENO	800
Effect of an External Electrode on the Characteristics of a Low Frequency Discharge	Ovidiu S. STOICAN	804
A One-Dimensional Kinetic Model of a Bounded Plasma System Containing Hot and Emitted Electrons with Drifting Velocity Distributions.....	Tomaž GYERGYEK, Milan ČERČEK and Borut JURČIČ-ZLOBEC	809
Numerical Analysis of Laser Produced Plasma Expansion with Large Ion Larmor Radius via 3D PIC Simulation	Masanori NUNAMI and Katsunobu NISHIHARA	815
Wave and MHD Phenomena		
Ion Acoustic Instability Due to Collisional Energy Transfer	Jovo VRANJES, Mitsuo KONO, Stefaan POEDTS and Masayoshi Y. TANAKA	819
Electron-Inertia Effects on the Transverse Gravitational Instability	Chanchal UBEROI	823
Parametric Studies of High- and Low-Frequency Magnetosonic Waves and Ion Acceleration in Two-Ion-Species Plasmas	Mieko TODA, Hiroyuki HIGASHINO and Yukiharu OHSAWA	826
Vlasov Simulation of Finite Amplitude Magnetohydrodynamic Waves in the Solar Wind: Development of Vlasov-Hall-MHD Code ...	Takashi KUMASHIRO, Tohru HADA, Yasuhiro NARIYUKI and Takayuki UMEDA	831
Dynamics of the Modulated Electron Beam in the Inhomogeneous Plasma Barrier: One-Dimensional Simulation	Igor O. ANISIMOV, Mariia J. SOLOVIOVA and Taras Eu. LITOSHENKO	837
Symmetries and Solutions of Equations Describing Force-Free Magnetic Fields	Emanuele TASSI, Francesco PEGORARO and Giampaolo CICOGLA	842
Structures' Formation in Inhomogeneous Plasma Excited by Thin Modulated Electron Beam	Taras Eu. LITOSHENKO and Ihor O. ANISIMOV	848
Transit-Time Effects on Cyclotron-Resonance Heating	K. AKIMOTO and H. HOJO	852
A Novel Method to Construct Stationary Solutions of the Vlasov-Maxwell System	Akihiro SUZUKI and Toshikazu SHIGEYAMA	856
Catalytic Effect on Ionization of Hydrogen	W. OOHARA and O. FUKUMASA	860
Multiple Ray Trace Analysis for Fast Wave Heating and Current Drive Using LHD Compline Antenna System	N. TAKEUCHI, H. IDEI, A. FUKUYAMA, T. SEKI, R. KUMAZAWA, T. MUTOH, K. SAITO, H. KASAHARA, Y. NAKAMURA, Y. TAKASE, T. WATARI and LHD ICRF Group	865
Time-Domain Model of a Traveling-Wave Tube.....	Anass AÏSSI, Frédéric ANDRÉ and Fabrice DOVEIL	869
Studying the Formation of the Pre-Sheath in an Oblique Magnetic Field Using a Fluid Model and PIC Simulation	Jernej KOVAČIČ, Tomaž Gyergyek and Milan ČERČEK	873
Current Sheet Thickness in the Plasma Focus Snowplow Model	Marcelo ZAMBRA, Dante KALISE, José FERNÁNDEZ, Edwin HERNÁNDEZ, Denisse PASTEN and Víctor MUÑOZ	879
Electrostatic Solitary Waves in Multicomponent Nonthermal Plasma	Nitin SHUKLA, Waleed M. MOSLEM and Padma K. SHUKLA	883
Selective Heating of Helium Ion in Magnetized Sheet Plasma	Y. OHARA, S. YASUDA, M. ONO, A. TONEGAWA and K. KAWAMURA	888
Parametric Excitation of Low Frequency Waves in ICRF-Produced Plasmas on GAMMA 10	Makoto ICHIMURA, Yuusuke YAMAGUCHI, Yukimi MOTEGI, Hiroshi MURO, Toshiaki OUCHI, Shoichi SATO, Tatsuya MURAKAMI, Yusuke SEKIHARA and Tsuyoshi IMAI	893
Flow and Vortex		
Monopole Drift-Wave Vortices in a Viscous Magnetized Plasma.....	Satoshi YASUDA and Koichi SAEKI	897
Mapping of Thermal Plasma Jet Non-Linear Dynamics in Reconstructed Phase Space	Jan GRUBER, Jan HLÍNA and Jiří ŠONSKÝ	900
Estimation of Minimum Size of Electrodes for Face-to-Face Double Probe Using Two-Dimensional Particle-in-Cell Simulation	Yoshifumi SAITOU and Akira TSUSHIMA	906
Discharge Bifurcation of Microwave-Sustained Helium Plasma Torch at Atmospheric Pressure	Shuichi TAKAMURA, Masashi KANDO and Noriyasu OHNO	910
Numerical Computation of Flows with Moving Boundaries Using an Immersed Interface Method	Caesar O. HARAHA and Hideaki MIURA	914
Acoustic Black Hole in Plasma Flow – Theory: Observation of a Classical Analogue to the Hawking Radiation	Yasusada NAMBU, Hiroyuki IWAYAMA, Hiromi SAIDA and Tatsuo SHOJI	920
Flowing Characteristics of Cold Arc Jet Plasma along Open Field Lines	Kazuyuki YOSHIDA, Tomohiko SHIBATA, Atsushi NEZU, Haruaki MATSUURA and Hiroshi AKATSUKA	923
Measurements of Argon-Ion Flow in Negative Ion Containing Plasmas	Sebastian ENGE, Gregor BIRKENMEIER, Alf KÖHN, Mirko RAMISCH and Ulrich STROTH	928
Statistical Mechanical Understanding of Two-Dimensional Point Vortex System at Negative Absolute Temperature	Yuichi YATSUYANAGI	931
Dynamic Behavior of Dust Flow with Velocity Shear in RF Plasma.....	Takuma GOHDA and Satoru IIZUKA	936
Non-Neutral Plasma		
Observation of Phase Transitions of 1-Dimensional Ion Clouds in a Linear RF Trap	Mitsutoshi ARAMAKI, Satoshi KAMEYAMA, Tatsuo SHOJI, Akihiro KONO and Yoichi SAKAWA	940

Elementary Processes of Free-Decaying Two-Dimensional Turbulence in Magnetized Pure Electron Plasmas	Yosuke KAWAI and Yasuhito KIWAMOTO	944
Coulomb Coupling and Heating of Charged Particle Beams in the Presence of Dispersion	Hiromi OKAMOTO, Hiroshi SUGIMOTO and Yosuke YURI	950
Numerical Investigation of Velocity Map of Outward Electrons Penetrating in Helical Magnetic Surfaces	Kazutaka NAKAMURA, Haruhiko HIMURA, Mitsutaka ISOBE, Akio SANPEI and Sadao MASAMUNE	955
Tune Depression of Ion Plasmas Observed in a Linear Paul Trap	Kiyokazu ITO, Shunsuke OHTSUBO, Hiroyuki HIGAKI, Kenji IZAWA and Hiromi OKAMOTO	959
Finite Two-Dimensional Systems of Electrons at Zero and Finite Temperatures: Simulations Based on Classical Map Hypernetted Chain (CHNC) Method	T. MIYAKE, K. NAKANISHI, C. TOTSUJI, K. TSURUTA and H. TOTSUJI	963
Implementing Methods of PIC Simulation by a Special Purpose Computer System for Gravitational N-Body Problems	K. MUTO, Y. MIZUNO, H. INUZUKA, Y. CAO and Y. LIU	967

Experiment on Transport & Global Aspect

Equilibrium of Field-Reversed Configuration Plasma Sustained by Rotating Magnetic Field	Kiyoyuki YAMBE, Michiaki INOMOTO and Shigefumi OKADA	971
Confinement Property of Tracer Impurity Particle inside a Static Magnetic Island O-Point of Large Helical Device	Naoki TAMURA, Yi LIU, Naofumi IWAMA, Shigeru SUDO, Konstantin V. KHLOPENKOV, Artem Yu. KOSTRIUKOV, Byron J. PETERSON, Shigeru INAGAKI, Yoshio NAGAYAMA, Kazuo KAWAHATA, Tomohiro MORISAKI, Katsumi IDA, Nobuyoshi OHYABU, Akio KOMORI and LHD Experimental Group	975
Configuration Control Experiments in Heliotron J	Tohru MIZUUCHI, Shinji KOBAYASHI, Hiroyuki OKADA, Kazunobu NAGASAKI, Satoshi YAMAMOTO, Gen MOTOJIMA, Shinya WATANABE, Kiyofumi MUKAI, Katsuyuki HOSAKA, Yusuke KOWADA, Shiori MIHARA, Akinobu MATSUYAMA, Yuji NAKAMURA, Kiyoshi HANATANI, Yasuhiro SUZUKI, Masayuki YOKOYAMA, Angela C. FERNÁNDEZ, Álvaro A. CAPPÀ, Shigeru KONOSHIMA, Katsumi KONDO and Fumimichi SANO	981
Optical Observation of Neutral Beam Attenuation in Hydrogen Discharge at LHD	Katsunori IKEDA, Masaki OSAKABE, Allan WHITEFORD, Katsumi IDA, Osamu KANEKO, Daiji KATO, Shigeru MORITA, Kenichi NAGAOKA, Yasuhiko TAKEIRI, Katsuyoshi TSUMORI, Masayuki YOKOYAMA, Mikio YOSHINUMA and LHD Experiment Group	987
Spectroscopic Investigation of the Ablation Cloud of Aluminum Pellets Injected in LHD	M. KOUBITI, M. GOTO, S. MORITA and R. STAMM	991
Plasmoid Motion in Helical Plasmas	Ryuichi ISHIZAKI and Noriyoshi NAKAJIMA	995
Enhancement of Performance of Compact Toroid Injector for LHD	Dazhi LIU, Naoyuki FUKUMOTO, Yusuke KIKUCHI, Masayoshi NAGATA and Junichi MIYAZAWA	999
Effects of Configuration Control on the Neoclassical Viscosity in Heliotron-J	Shin NISHIMURA, Yuji NAKAMURA, Gen MOTOJIMA, Hiroyuki OKADA, Shinji KOBAYASHI, Satoshi YAMAMOTO, Kazunobu NAGASAKI, Kiyoshi HANATANI, Katsumi KONDO, Tohru MIZUUCHI and Fumimichi SANO	1003
Experimental Study of Non-Inductive Current in Heliotron J	Gen MOTOJIMA, Kazunobu NAGASAKI, Hiroyuki OKADA, Kiyomasa WATANABE, Tohru MIZUUCHI, Akinobu MATSUYAMA, Kiyoshi HANATANI, Satoshi YAMAMOTO, Shinji KOBAYASHI, Yasuhiro SUZUKI, Katsumi KONDO, Yuji NAKAMURA, Angela C. FERNÁNDEZ, Álvaro A. CAPPÀ, Yasuo YOSHIMURA, Shinya WATANABE, Kiyofumi MUKAI and Fumimichi SANO	1010
Calorimetric Measurement of Kinetic Energy of Compact Toroid in the Spherical Tokamak CPD	H. HONMA, K. HANADA, N. FUKUMOTO, M. NAGATA, N. NISHINO, K.N. SATO, K. NAKAMURA, H. ZUSHI, H. IDEI, M. SAKAMOTO, M. HASEGAWA, S. KAWASAKI, H. NAKASHIMA, A. HIGASHIJIMA, S. KAWAKAMI and T. YOSHINAGA	1015
Density and Potential Fluctuation Measurements in the Tandem Mirror GAMMA 10 Plasma	Masayuki YOSHIKAWA, Yoshiaki MIYATA, Toshiaki MATSUMOTO, Masanori MIZUGUCHI, Yoshitaka YONEDA, Shinsuke NEGISHI, Neo IMAI, Kazutaka KIMURA, Yoriko SHIMA, Youhei OONO, Akiyosi ITAKURA, Hitoshi HOJO and Tsuyoshi IMAI	1020
MHD Motion in Field-Reversed Configuration Plasma	Taeko IKEYAMA, Masanori HIROI and Yasuyuki NOGI	1025
Characterization of MHD Behavior in a Low-Aspect Ratio RFP	Ryuya IKEZOE, Takumi ONCHI, Kensuke OKI, Akio SANPEI, Haruhiko HIMURA and Sadao MASAMUNE	1031
Appropriateness Examination of the Model Functions for the Equilibrium Reconstruction Analysis	Satoru MOTOHASHI, Masahiro IWASAKI and Mitsuaki MAEYAMA	1036
Non-Inductive Plasma Start-Up and Sustainment by Wave Heating at Two Frequencies in the TST-2 Spherical Tokamak	Osamu WATANABE, Takuya OOSAKO, Akira EJIRI, Yoshihiko NAGASHIMA, Hiroki KURASHINA, Takashi YAMAGUCHI, Yuuki ADACHI, Hiroshi TOJO, Kotaro YAMADA, Yuichi TAKASE, Hazuki MATSUZAWA, Hiroaki KOBAYASHI, An Bung IL, Hiroyuki HAYASHI, Makoto SASAKI and Tetsuya MASUDA	1040
Analyses and Experiments of Compact Spherical Tokamak-Stellarator "TOKASTAR"	Kozo YAMAZAKI, Yuichi TAIRA, Tetsutarou OISHI, Hideki ARIMOTO and Tatsuo SHOJI	1044

Characteristics of SVD in ST Plasma Shape Reproduction Method Based on CCS	Kazuo NAKAMURA, Shinji MATSUFUJI, Masashi TOMODA, Feng WANG, Osamu MITARAI, Kenichi KURIHARA, Yoichi KAWAMATA, Michiharu SUEOKA, Makoto HASEGAWA, Kazutoshi TOKUNAGA, Kohnosuke SATO, Hideki ZUSHI, Kazuaki HANADA, Mizuki SAKAMOTO, Hiroshi IDEI, Shoji KAWASAKI, Hisatoshi NAKASHIMA and Aki HIGASHIJIMA	1048
High Beta Discharges with Hydrogen Storage Electrode Biasing in the Tohoku University Heliac	Hiroyasu UTOH, Kiyohiko NISHIMURA, Hajime UMETSU, Keiichi ISHII, Shigeru INAGAKI, Masayuki YOKOYAMA, Yasuhiro SUZUKI, Hiromi TAKAHASHI, Yutaka TANAKA, Atsushi OKAMOTO, Takashi KOBUCHI, Sumio KITAJIMA and Mamiko SASAO	1052
Translation of Field-Reversed Configuration into a Confinement Region Filled with Neutral Gas	T. ASAI, Y. MATSUZAWA, N. YAMAMOTO, K. TAKAO, H. TAMURA, M. HIYOSHI, T. SASAKI, Ts. TAKAHASHI, Y. NOGI, M. INOMOTO, To. TAKAHASHI, J. MIYAZAWA and Y. NARUSHIMA	1058
Formation of Field-Reversed Configuration by Larger Rotating Magnetic Field	M. OHNISHI, T. CHIKANO, M. TSUKAMOTO, M. FUKUHARA, T. MASAKI, H. OSAWA and W. HUGRASS	1062
Characterization of Equilibria in a Low-Aspect-Ratio RFP	Akio SANPEI, Kensuke OKI, Ryuya IKEZOE, Takumi ONCHI, Hiroyuki SHIMAZU, Tetsuo YAMASHITA, Haruhiko HIMURA and Sadao MASAMUNE	1066

Experiment on MHD

MHD Stability Analysis of IDB Plasma in LHD.....	Yoshiro NARUSHIMA, Kiyomasa Y. WATANABE, Ryuichi SAKAMOTO, Ichihiko YAMADA, Kazumichi NARIHARA, Yasuhiro SUZUKI, Satoru SAKAKIBARA, Satoshi OHDACHI, Hiroshi YAMADA, LHD Experimental Group, Wilfred A. COOPER and Jacobo VARELA RODRIGUEZ	1070
MHD Relaxation and Plasma Flow Driven by Coaxial Helicity Injection in the HIST Spherical Torus Device	Yusuke KIKUCHI, Shotaro HASHIMOTO, Tsutomu NISHIOKA, Kisato ANDO, Naoyuki FUKUMOTO and Masayoshi NAGATA	1075
Modeling Ion Acceleration in a Z-Pinch by an M=0 Instability with Hall-MHD	Julio J. MARTINELL and Rosa M. FAJARDO	1079

Experiment on High Energy Particles & Waves

Fast Particle Loss-Cone Measurements by Angular Resolved Multi-Sightline Neutral Particle Analyzer (ARMS-NPA) in Large Helical Device (LHD)	Evgeny A. VESHCHIEV, Tetsuo OZAKI, Pavel R. GONCHAROV, Shigeru SUDO and LHD Experimental Group	1084
Radial Profiles of High-Energy Particles in NBI and ICH Plasmas Measured by Pellet Charge Exchange Technique on Large Helical Device	Tetsuo OZAKI, Pavel R. GONCHAROV, Evgeny VESHCHIEV, Naoki TAMURA, Shigeru SUDO, Tetsuo SEKI, Hiroshi KASAHARA, High Energy Particle Group, Wave Heating Group, LHD Experimental Group, Yuichi TAKASE and Takuya OHOSAKO	1089
Higher Harmonic ECE Spectrum and Its Change during ECRH in LHD	Shin KUBO, Hiroe IGAMI, Yoshio NAGAYAMA, Sadatsugu MUTO, Takashi SHIMOZUMA, Yasuo YOSHIMURA, Hiromi TAKAHASHI and Takashi NOTAKE	1095
Observation of Fast Ion Response to MHD Activities in Heliotron J	Kenichi NAGAOKA, Shinji KOBAYASHI, Katsuyuki HOSAKA, Satoshi YAMAMOTO, Tohru MIZUUCHI, Masaki OSAKABE, Yasuhiko TAKEIRI, Kazunobu NAGASAKI, Hiroyuki OKADA, Katsumi KONDO, Kiyoshi HANATANI and Fumimichi SANO	1100
Ray Trace and Fokker-Plank Analyses for Electron Bernstein Wave Heating and Current Drive in QUEST	H. IDEI, N. TAKEUCHI, S. KUBO, A. FUKUYAMA, H. NUGA, M. SAKAGUCHI, N. NAKAMURA, K. HANADA, H. ZUSHI, K.N. SATO, M. SAKAMOTO, M. HASEGAWA, Y. TAKASE, O. MITARAI, T. MAEKAWA and Y. KISHIMOTO	1104
Possibility of Excitation of Alfvén Eigenmodes by Energetic Ions Near the Plasma Edge in the Compact Helical System	Takafumi ITO, Kazuo TOI, Go MATSUNAGA, Mitsutaka ISOBE, Tsuyoshi AKIYAMA, Takashi MINAMI, Kenichi NAGAOKA and CHS Experimental Group	1108
Electron Heating by ICRF Mode-Conversion Heating in LHD.....	Tetsuo SEKI, Takashi MUTOH, Ryuhei KUMAZAWA, Kenji SAITO, Hiroshi KASAHARA, Yanping ZHAO, Jong-Gu KWAK and LHD Experimental Group	1112

Theory on Transport

Analysis of the High-Z Impurity Transport in a Tokamak by the IMPGYRO Code	M. TOMA, K. HOSHINO, K. INAI, M. ISHIDA, A. HATAYAMA and K. OHYA	1116
A Global Simulation Study of ICRF Heating by TASK/WM and GNET in Toroidal Plasmas	Tetsuya YAMAMOTO, Sadayoshi MURAKAMI and Atsushi FUKUYAMA	1120
Self-Consistent Analysis of Fundamental and Higher Harmonic ICRF Heating in Tokamak Plasmas	Hideo NUGA and Atsushi FUKUYAMA	1125
Effect of Nuclear Elastic Scattering on Fusion Product Spectrum in Self-Sustaining D ³ He Plasmas	Tomohiro FUKUE, Hideaki MATSUURA and Yasuyuki NAKAO	1129
Numerical Modelling of High Energy Ion Transport in Tokamak Plasmas	Kiyotaka HAMAMATSU	1134
Integrated Modeling for Control of Advanced Tokamak Plasma.....	Takahisa OZEKI, Nobuhiko HAYASHI, Mitsuru HONDA, Nobuyuki AIBA, Kiyotaka HAMAMATSU, Katsuhiro SHIMIZU, Hisato KAWASHIMA, Kazuo HOSHINO, Tomonori TAKIZUKA and Shinji TOKUDA	1138
Characteristics of a Complex-Conjugate Antenna System for ICRF Heating	Ryuhei KUMAZAWA, Akinori KATOH, Hiroshi KASAHARA, Kenji SAITO, Tetsuo SEKI, Takashi MUTOH, Fujio SHINPO, Goro NOMURA, Yanping ZHAO, Jae-Sung YOON and, Jong-Gu KWAK	1143

Trapped Particles in the Reversed Field Pinch.....	Marco GOBBIN, Luca GUAZZOTTO, Shi Chong GUO, Italo PREDEBON, Fabio SATTIN, Gianluca SPIZZO, Paolo ZANCA and Susanna CAPPELLO	1147
EBW Simulations in an Experimental Context.....	J. URBAN, J. PREINHAELTER, S.J. DIEM, H.P. LAQUA, P. PAVLO, V. SHEVCHENKO, G. TAYLOR, G. VAHALA, L. VAHALA and M. VALOVIČ	1153
Development and Parallelization of Gyrokinetic PIC Code for MHD Simulation.....	Hiroshi NAITOU, Kenichi KOBAYASHI, Hiroki HASHIMOTO, Shinji TOKUDA and Masatoshi YAGI	1158
Theory on MHD		
Extension of Electron Dissipation Region along the Downstream Direction in Steady Collisionless Driven Reconnection.....	Bin LI and Ritoku HORIUCHI	1162
Nonlinear MHD Simulation of Current Drive by Coaxial Helicity Injection in Spherical Torus.....	Takashi KANKI, Masayoshi NAGATA and Yasuhiro KAGEI	1167
Multi-Scale MHD Simulation Incorporating Pressure Transport Equation for LHD Plasma.....	Katsuji ICHIGUCHI and Benjamin A. CARRERAS	1171
Conjugate Variable Method for Applying to MHD Stability Analysis.....	Shinji TOKUDA	1176
Effects of Micro-Fluctuations on Magnetic Island Evolution.....	S. NISHIMURA, S. BENKADDA, M. YAGI, S.-I. ITOH and K. ITOH	1179
Nonlinear Dynamics of Magnetic Islands in Presence of Interchange Turbulence.....	M. MURAGLIA, O. AGULLO, S. BENKADDA, X. GARDET, P. BEYER and A. SEN	1183
Outlook for Reactor		
Effect of Nuclear Elastic Scattering on Energy Transfer Process of ICRF Resonated Ions in DT Plasmas.....	Atsushi FUJIMARU, Hideaki MATSUURA and Yasuyuki NAKAO	1187
Deuterium Retention and Desorption Behavior of Li_2TiO_3 after Deuterium Ion Irradiations with Different Temperatures.....	Hironobu SHIBATA, Yuji NOBUTA, Yuji YAMAUCHI, Tomoaki HINO, Masato AKIBA and Satoshi SUZUKI	1191
Modification of Alpha-Particle Emission Spectrum and Its Effect on Plasma Heating Characteristics in Beam-Injected DT Plasmas.....	Hideaki MATSUURA and Yasuyuki NAKAO	1195
Fast Ignition		
Direct-Indirect Hybrid Implosion in Heavy Ion Inertial Fusion.....	Yoshifumi IIZUKA, Shigeo KAWATA, Tomohiro KODERA, Alexander I. OGOYSKI and Takashi KIKUCHI	1200
Ignition and Burn Dynamics of DT Fuels in Impact Fast Ignition.....	Tomoyuki JOHZAKI, Masakatsu MURAKAMI, Hiroshi AZECHI and Kunioki MIMA	1204
Hollow Ion Spectra in Warm Dense Laser-Produced Plasma: Observation and Modeling.....	Anatoly Ya. FAENOV, Tatiana A. PIKUZ, Igor Yu. SKOBELEV, Yuji FUKUDA, James COLGAN and Joe ABDALLAH Jr.	1210
Development of High-Order Harmonic Light Spectrometer for Observation of Strong Magnetic Field Generated by Fast Electrons in Laser-Plasma Interactions.....	Hideaki HABARA, Masashi YAMAMOTO, Takahiro KURAHASHI, Kenji KIDA and Kazuo A. TANAKA	1214
Simultaneous Measurement of Implosion Process and Heating Laser Injection by Using X-Ray Framing Camera.....	Mayuko KOGA, Takashi FUJIWARA, Tatsuhiro SAKAIYA, Myongdok LEE, Keisuke SHIGEMORI, Hiroyuki SHIRAGA, Hiroshi AZECHI and Tetsuo OZAKI	1218
Monte-Carlo Simulations for Heating of Superdense Matter by Relativistic Electrons.....	A. OKABAYASHI, T. YABUUCHI, H. HABARA and K.A. TANAKA	1222
Expansion of Two-Ion-Species Spherical Plasmas as a Source of Mono-Energetic Ions.....	K.I. POPOV, V. Yu. BYCHENKOV, I.A. ANDRIYASH, R.D. SYDORA and W. ROZMUS	1226
Central Ignition Laser Fusion		
Halo Formation and Emittance Growth during Bunch Compression of High-Current Heavy Ion Beams.....	Takashi KIKUCHI and Kazuhiko HORIOKA	1230
The Investigation of Rayleigh-Taylor Instability Growth Rate in Inertial Confinement Fusion.....	Abbas GHASEMIZAD, Hanif ZARRINGHALAM and Leila GHOLAMZADEH	1234
Plasma Focus		
Correlation between Plasma Pinch Intensity and Current Sheath Symmetry in Amirkabir Plasma Focus Facility.....	Reza AMROLLAHI, Morteza HABIBI and G. Reza. ETAATI	1239
Chemically Non-Equilibrium Modeling of Argon Inductively Coupled Thermal Plasma with C-H-O Systems.....	Sharif Abdullah Al-MAMUN, Yasunori TANAKA and Yoshihiko UESUGI	1243
Numerical Study for a Protection of Laser Beam Port by Magnetic Fields in the Laser Fusion Reactor KOYO-F.....	Yoshihiro KAJIMURA, Ryo KAWABUCHI, Akihiro MAENO, Hideki NAKASHIMA and Takayoshi NORIMATSU	1248
Hydrogen Retention in the First Wall Tiles of JT-60U.....	M. YOSHIDA, T. TANABE, Y. NOBUTA, K. SUGIYAMA, T. HYASHI, K. MASAKI, J. YAGYU and M. SATO	1253
Dynamics of Ablation Plumes Produced by Fusion Products in Laser Fusion Liquid Wall Chamber.....	Hiroyuki FURUKAWA	1256
Plasma Sources & Atomic Processes		
Enhancement of the Usage of Cathode Materials in a Magnetron Sputter.....	Chae-Hwa SHON, Uk-Sung KIM, Deok-Woo HAN and Youl-Moon SUNG	1261
Study of Plasma Sheath Formation in a Low Energy Plasma Focus.....	Farzin M. AGHAMIR and Reza A. BEHBAHANI	1265
Double Layer Formation in a Low-Pressure Argon Plasma Expanded by Permanent Magnets.....	Kazunori TAKAHASHI, Kaoru OGUNI, Hiroshi YAMADA and Tamiya FUJIWARA	1269

High Energy Deuteron Emission in NX2 Plasma Focus	
.....Mahmud V. ROSHAN, Rajdeep S. RAWAT, Alireza TALEBITAHER, Rishi VERMA, Paul LEE and Stuart V. SPRINGHAM	1273
Langmuir Probe Measurements of Spatial Plasma Profiles and Temporal Dependences	
in a DC-Energized Hollow-Cathode Plasma Jet System..... Milan TICHÝ, Zdeněk HUBIČKA, Petr VIROSTKO, Irena PICKOVÁ, Miloš ŠÍCHA, Martin ČADA, Jiří OLEJNÍČEK, Olexandr CHURPITA, Lubomír JASTRABÍK, Petr ADÁMEK, Pavel KUDRNA, Jan KLUSON, Sergey LESHKOV, Mariya CHICHINA and Štěpán KMENT	1277
A Fast Miniature Plasma Focus Based Compact and Portable Nanosecond Pulsed Neutron Source	
.....Rishi VERMA, R.S. RAWAT, P. LEE, S.V. SPRINGHAM, T.L. TAN, M.V. ROSHAN and M. KRISHNAN	1283
Electron Temperature Control by Applying DC Voltage to a Mesh Grid Blanketed with Thin Films in Reactive Plasmas	
..... Kohgi KATO, Junichi EMI and Satoru IIZUKA	1287
Two-Dimensional Spatial Structure of Inductively Coupled Plasma with One Internal Loop Antenna	
..... Yasunori OHTSU, Kazuhiro ARAMAKI and Hiroharu FUJITA	1291
A Large Volume High Pressure Plasma Source by Using Cylindrical Parallel MCS Discharge	
..... M. MAEYAMA, Y. AKASHI, A. ISHIGYA, K. NAGANO and H. TANAKA	1295

Light and X Ray Sources

Femtosecond-Laser-Driven Cluster-Based Debris-Free Soft X-Ray Source for Nanostructure Imaging	
.....Tatiana A. PIKUZ, Anatoly Ya. FAENOV, Igor Yu. SKOBELEV, Sergei V. GASILOV, Aleksey S. BOLDAREV, Vladimir A. GASILOV, Yuji FUKUDA, Masaki KANDO, Hideyuki KOTAKI, Izuru DAITO, Takayuki HOMMA, Keigo KAWASE, Takashi KAMESHIMA, Tetsuya KAWACHI, Paul BOLTON, Hiroyuki DAIDO, Toyoaki KIMURA, Toshiki TAJIMA, Yoshiaki KATO and Sergei V. BULANOV	1300
UV-Emission from Poly-Phase Molecular Discharge/Plasma Confined by Multi-Pole Magnetic Field	
..... Kazunori MATSUMOTO and Yuki TAIRA	1304
Measurements of Distributions of Ba Atom Density and Electrode Temperature in Low-Pressure Fluorescent Lamp	
..... M. NAKA, M. KAI, Y. EGASHIRA, K. TOMITA, Y. MANABE, Y. YAMAGATA and K. UCHINO	1308
Study on the Wall Blackening of a High Intensity Discharge Lamp	
..... Yuji SHATA, Toshiro KASUYA, Yasuyuki KIMURA, Shigeo GOTOH and Motoi WADA	1313
The Possibility of a Capillary Discharge Soft X-Ray Laser with Shorter Wavelength by Utilizing a Recombination Scheme	
..... Yusuke SAKAI, Shunsuke TAKAHASHI, Tomonao HOSOKAI, Masato WATANABE, Akitoshi OKINO and Eiki HOTTA	1317

Atmospheric·Micro·Thermal Plasmas

Experimental Study on Focusing Multiple Atmospheric-Pressure Plasma Jets	
..... Kiyoyuki YAMBE, Hajime SAKAKITA, Haruhisa KOGUCHI, Satoru KIYAMA, Nagayasu IKEDA and Yoichi HIRANO	1322
Plasma Production in Pressurized Carbon Dioxide up to Supercritical Conditions	
..... Maya TAKADE, Tsuyoshi KIYAN, Kazusa MIYAJI, Takao NAMIHARA, Masanori HARA and Hidenori AKIYAMA	1326
Characteristics of Helium Microwave-Induced Atmospheric Pressure Plasma for Fine Particle Analysis	
..... Tetsu OKAMOTO and Yukio OKAMOTO	1330
RF Impulse Barrier Discharge for MgO Microparticle Formation in Sub-Atmospheric Pressure Regime	
..... Takumasa MURAOKA and Satoru IIZUKA	1335
Portable Marx Generator for Microplasma Applications	
..... T. UENO, T. SAKUGAWA, M. AKIYAMA, T. NAMIHARA, S. KATSUKI and H. AKIYAMA	1339
Electron Transport in Hydrogen Thermal Plasmas	
..... Gurpreet SINGH, Rohit SHARMA and Kuldip SINGH	1344
Transition from Thermal to Recombining Plasma in a Free Expanding Arc Jet Plasma Generator	
..... Shinichi NAMBA, Keisuke NAKAMURA, Noriyasu YASHIO, Shinya FURUKAWA, Ken TAKIYAMA and Kuninori SATO	1348
Control of Induction Thermal Plasmas by Coil Current Modulation in Arbitrary-Waveform	
..... Yuki TSUBOKAWA, Farees EZWAN, Yasunori TANAKA and Yoshihiko UESUGI	1353

Plasma Processes for Semiconductor Applications

Oblique Argon Ion Etching for Copper at Elevated Temperature	
..... Tatsuro KOBAYASHI, Yuji NOBUTA, Yuji YAMAUCHI and Tomoaki HINO	1358
Mass Spectrometric Analysis of Chemical Species in the Downstream Region of Ar/CF ₄ /H ₂ Plasmas	
..... Yuji TAMAI, Hiroshi OKUMURA, Kenji FURUYA and Akira HARATA	1361

Plasma Processes for Surface Treatment

Effective Work Function of an Oxide Cathode in Plasma	
..... Motoi WADA, Shigeo GOTOH and Shinichi KURUMADA	1366
Numerical Simulation of Plasma-Immersion Ion Implantation on Insulators	
..... Christophe P. CORNET, David R. McKENZIE and Marcela M.M. BILEK	1370
Optical Property Change on Metallic Mirror Materials by Low Energy Helium Irradiation	
..... K. TOKUNAGA, T. FUJIWARA, N. YOSHIDA, A. EBIHARA, M. TOKITANI, A. SAGARA, S. NAGATA and B. TSUSHIYA	1374
Behavior of Amorphous Metal Alloy Mirrors under Ion Bombardment	
..... Vladimir S. VOITSENYA, Alexandr S. BAKAI, Alexandra F. BARDAMID, Vladimir G. KONOVALOV, Konstantin V. KOVTUN, Diana I. NAIDENKOVA, Ivan V. RYZHKOV, Anatoly F. SHTAN', Sergei I. SOLODOVCHENKO, Oleg V. TREMBACH and Andrei A. VASIL'EV	1379
Microstructure and Property of Zr-Based Metallic Glass Coating Formed by Gas Tunnel Type Plasma Spraying	
..... Akira KOBAYASHI, Toshio KURODA, Hisamichi KIMURA and Akihisa INOUE	1385
Effect of Nitrogen Ion Implantation on Corrosion Resistance of Ti Films Deposited on Steel 304 by Ion Beam Sputtering	
..... H. EBRAHIMIAN, M. GHORANNEVISS, A. SHOKOUHY, M. YARI, M. ESHGHABADI and D. HANIFEH	1389

Hydrophilization of Polycarbonate by Ar Glow Discharge	Koji NAGAI, Yuji NOBUTA, Yuji YAMAUCHI and Tomoaki HINO	1392
Effects of Low Temperature Plasma Treatment on Poly Vinyl Chloride Film	Abbas ANVARI, Mahmood GHORANNEVISS, Sheila SHAHIDI, Raziye ENJILELA and Ali HOJABRI	1395
Effects of Ion Temperature on Collisional DC Sheath in Plasma Ion Implantation	Mansour KHORAMABADI, Hamid R. GHOMI and Mahmoud GHORANNEVIS	1399
Influence of Nitrogen Content on the Structural and Mechanical Properties of TiN Thin Films	Nadia SAOULA, Karim HENDA and Rafika KESRI	1403
Surface Nitriding of Light Metals Using Electron-Beam-Excited-Plasma (EBEP) Source	Ryuta ICHIKI, Yuusuke KUBOTA, Masashi YOSHIDA, Yuji FUKUDA, Yasuyuki MIZUKAMO and Tamio HARA	1408
Ion Energy Measurements in Mesh Assisted Plasma Immersion Ion Implantation	Scott Y. ALLAN, Christophe P. CORNET, David R. McKENZIE and Marcela M.M. BILEK	1412
Dependence of Decontamination Performance on Co Distribution in Test Pieces in Dry Surface Decontamination with Low-Pressure Arc Plasma.....	Shizue FURUKAWA, Makoto ICHIMURA, Tadashi AMAKAWA and Kazuo ADACHI	1417
Production of High Quality Ti-HAP Functionally Graded Coating Using Well-Controlled Thermal Plasmas	Takafumi TODA, Masahiro KOU, Satoru FUJIMOTO, Osamu FUKUMASA and Wataru OOHARA	1422

Material Formation and Synthesis

Effects of Gas Pressure and Discharge Power on Electrical and Optical Properties of ZnO:Al Thin Film Deposited on Polymer Substrate	Dong-Joo KWAK, Byung-Wook PARK, Youl-Moon SUNG and Min-Woo PARK	1427
Preparation of WO ₃ Thin Films for Electrochromic Display by Plasma Process	Hiroharu KAWASAKI, Takeaki MATSUNAGA, Weimin GUAN, Tamiko OHSHIMA, Yoshihito YAGYU and Yoshiaki SUDA	1431
Dependence of Volume Fraction of Clusters on Deposition Rate of a-Si:H Films Deposited Using a Multi-Hollow Discharge Plasma CVD Method.....	Hiroshi SATO, Yuuki KAWASHIMA, Masatoshi TANAKA, Kazunori KOGA, William M. NAKAMURA and Masaharu SHIRATANI	1435
Mechanically Hard SiC _x H Films in Amorphous Phase.....	Haruhiko ITO, Akio SHINOHARA and Hidetoshi SAITOH	1439
Substrate Temperature Dependence of Deposition Profile of Plasma CVD Carbon Films in Trenches	Jun UMETSU, Kazuhiko INOUE, Takuya NOMURA, Hidefumi MATSUZAKI, Kazunori KOGA, Masaharu SHIRATANI, Yuichi SETSUHARA, Makoto SEKINE and Masaru HORI	1443
A Novel Method for the Production of AlN Film with High Adhesion on Al Substrate	Masashi YOSHIDA, Masahiro OKUMIYA, Ryuta ICHIKI, Cagri TEKMEK, Waleed KHALIFA, Yoshiki TSUNEKAWA and Tamio HARA	1447
Preparation of Plasma-Polymerized <i>p</i> -Xylene Films for Encapsulation of Organic Light-Emitting Diodes	Minoru KUSABIRAKI and Takeshi FUJISAWA	1451
Properties of GZO Thin Film Deposited at Various Positions in the Plasma Plume in PLD Method	Yoshihiro UMEDA, Fumiaki MITSUGI and Tomoaki IKEGAMI	1455

Environmental Technologies

Water Purification Using Non-Thermal Plasma Driven by Blumlein-Line Stacked Pulsed Power Generator	Katsuyuki TAKAHASHI, Seiji MUKAIGAWA, Koichi TAKAKI, Tamiya FUJIWARA and Naoya SATTA	1459
Influence of NO Concentration on Removal Efficiency in Multipoint-to-Plane Electrode Dielectric Barrier Discharge Reactor	Koichi TAKAKI, Taiki SATO, Jun NAITO, Seiji MUKAIGAWA and Tamiya FUJIWARA	1463
Observation of Particulate Matter Combustion in a Pulsed Discharge Duration	Shuiliang YAO, Satoshi KODAMA, Shin YAMAMOTO, Chieko MINE and Yuichi FUJIOKA	1467
Recycle of Metal-Plating Plastics by Pulse Arc Discharge	Takashi NAGASHIMA, Hidenori AKIYAMA, Takao NAMIHIRA and Sunao KATSUKI	1471

Pulsed Power

Experimental Study on Disk Type Cold Cathode in Weakly Relativistic Energy Region	H. OE, K. OGURA, Y. KAZAHARI, K. BANSHO, H. IIZUKA, A. SUGAWARA and W.S. KIM	1477
Estimation of Very Fast Transient Voltage Distribution in Air-Cored Pulsed Transformer Windings Based on FDTD Method	Edris AGHEB, Amir HAYATI SOLOOT, Ehsan HASHEMI, Jouya JADIDIAN and Amir A. SHAYEGANI AKMAL	1483
EMTP Modeling of Air-Cored Transformer Windings under High-Frequency Transient	Edris AGHEB, Amir A. SHAYEGANI AKMAL, Sadegh ESMAILZADEH, Ehsan HASHEMI and Jouya JADIDIAN	1487
Numerical Simulation of an Explosively Driven HVDC Circuit Breaker	Jouya JADIDIAN, Kaveh NIAYESH, Ehsan HASHEMI, Edris AGHEB and Amir A. SHAYEGANI	1491
A Novel Method for High Current Vacuum Arc Interruption Using Externally Applied Ultra High Axial Pulsed Magnetic Field	Jouya JADIDIAN, Kaveh NIAYESH and Ehsan HASHEMI	1496
Analysis of Behavior of Charged Particles in Cusp Type Direct Energy Converter for Advanced Fusion	Kazuki GOTO, Akio TANIGUCHI, Hiromasa TAKENO and Yasuyoshi YASAKA	1501
Plasma Dynamics in Different X Pinches Loads of Megaampere Range	S. ANAN'EV, Yu. BAKSHAEV, A. BARTOV, P. BLINOV, A. CHERNENKO, S. DANKO, E. KAZAKOV, Yu. KALININ, A. KINGSEP, V. KOROLEV, V. MIZHIRITSKY, S. PIKUZ, T. SHELKOVENKO, S. TKACHENKO and A. ZELENNIN	1505
A THz Gyrotron FU CW III with a 20T Superconducting Magnet	Toshitaka IDEHARA, Isamu OGAWA, Hideaki MORI, Shin-ichiro KOBAYASHI, Seitaro MITSUDO and Teruo SAITO	1508

Analysis of Slow-Wave Instability in Rectangularly Corrugated Cylindrical Waveguide	
..... Y. TAKASHIMA, K. OGURA, M. YAMAKAWA, K. OTUBO and Md. R. AMIN	1512
THz Gyrotrons – FU CW Series for High Power THz Technologies	
..... Toshitaka IDEHARA, Teruo SAITO, Isamu OGAWA, Seitaro MITSUDO and Yoshinori TATEMATSU	1518
Ion/Electron/Neutral Beams	
Development of Bipolar Pulse Accelerator for Intense Pulsed Heavy Ion Beam	
..... Hiroaki ITO, Iwao KITAMURA and Katsumi MASUGATA	1522
Diagnosis of Intense Pulsed Aluminium Ion Beam by Magnetically Insulated Ion Diode	
..... Hiroaki ITO, Kodai FUJIKAWA and Katsumi MASUGATA	1526
Uniform Negative Ion Beam Extraction in a Cesium-Seeded Large Negative Ion Source with a Tent Magnetic Filter	
..... H. TOBARI, M. HANADA, T. INOUE, M. TANIGUCHI, M. KASHIWAGI, K. WATANABE, N. UMEDA and K. SAKAMOTO	1530
Waveguide Modes in a Relativistic Electron Beam with Ion-Channel Guiding	
..... Behrouz MARAGHECHI and Borna MARAGHECHI	1534
Study of the Beam Transport in a High-Energy Neutral Helium Beam System with Double Charge Exchange Cell	
..... Masahiro KIKUCHI, Nozomi TANAKA, Takayuki NAGAMURA, Takashi KOBUCHI, Atsushi OKAMOTO, Sumio KITAJIMA, Mamiko SASAO, Hitoshi YAMAOKA and Motoi WADA	1539
Ion Beam Current Characteristics of Bernas-Type Ion Source with a Co-Axial Cathode	
..... Naoki MIYAMOTO, Shinsuke IMAKITA, Toshiro KASUYA, Satoshi SHIMAMOTO and Motoi WADA	1542
Development of Negative Ion Based Neutral Beam Injector toward JT-60SA	
..... Yutaka TANAKA, Masaya HANADA, Kaoru KOBAYASHI, Masaki KAMADA and Masashi KISAKI	1547
Laser Plasma Application	
Wave Mode Couplings in a Free-Electron Laser with Axial Magnetic Field in the Presence of Self-Fields	
..... Behrouz MARAGHECHI, Haleh MAHDAVI and Taghi MOHSENPOUR	1551
Plasma Propulsion	
Electron Density Fluctuations in a Hall Plasma Thruster: Observations by Collective Light Scattering	
..... Sedina TSIKATA, Nicolas LEMOINE, Vitaliy PISAREV and Dominique GRESILLON	1556
Experimental Study of Ion Heating and Acceleration in a Fast-Flowing Plasma for the Advanced Plasma Propulsion	
..... Akira ANDO, Tatsuya HAGIWARA, Shingo JO, Takahiro TAGUCHI, Kunihiko HATTORI and Masaaki INUTAKE	1560
Development of a Differential Radio Frequency Ion Thruster for Precision Spacecraft Control	
..... Cheryl M. COLLINGWOOD, Stephen B. GABRIEL, Michael H. CORBETT, Neil C. WALLACE and Peter JAMESON	1564
Multi-Scale Plasma Particle Simulation for the Development of Interplanetary Flight System	
..... Hideyuki USUI, Yoshihiro KAJIMURA, Masanori NUNAMI, Ikkoh FUNAKI, Iku SHINOHARA, Hiroshi YAMAKAWA, Masao NAKAMURA, Daisuke AKITA and Hiroko O. UEDA	1569
MHD Flow Field and Momentum Transfer Process of Magneto-Plasma Sail	
..... Hiroyuki NISHIDA, Ikkoh FUNAKI, Yoshifumi INATANI and Kanya KUSANO	1574
Research Status of Sail Propulsion Using the Solar Wind.....	Ikkoh FUNAKI and Hiroshi YAMAKAWA 1580
Imaging of Plasma Flow around Magnetoplasma Sail in Laboratory Experiment	
..... Kazuma UENO, Tomohiro AYABE, Ikkoh FUNAKI, Hideyuki HORISAWA and Hiroshi YAMAKAWA	1585
An Ion Machined Accelerator Grid for a 20-cm ECR Ion Thruster	
..... Kazutaka NISHIYAMA, Yasuhiro TOYODA, Satoshi HOSODA, Yukio SHIMIZU and Hitoshi KUNINAKA	1590
Hollow Cathode Life Time Model.....	Michele COLETTI and Stephen B. GABRIEL 1595
A Magnetic Thrust Chamber Design for a Laser Fusion Rocket Based on Impact Fast Ignition Scheme	
..... Nobuo MATSUDA, Akihiro MAENO, Yoshihiro KAJIMURA and Hideki NAKASHIMA	1602
Evaluation of Electric Field Measurement in Space Environment	
..... Takanobu MURANAKA, Hiroko O. UEDA, Hideyuki USUI and Iku SHINOHARA	1606
Pulsed Plasma Acceleration Using Powdered Propellant.....	Takefumi SAITO, Hiroyuki KOIZUMI and Hitoshi KUNINAKA 1611
Numerical Study of Inflation of a Dipolar Magnetic Field in Space by Plasma Jet Injection	
..... Yoshihiro KAJIMURA, Hideyuki USUI, Masanori NUNAMI, Ikkoh FUNAKI, Iku SHINOHARA and Hideki NAKASHIMA	1616
Novelty and Education	
Collisionless Electron Heating in a Very High Frequency Neutral Loop Discharge	
..... Aleksey V. ARSENIN, Vladimir G. LEIMAN and Vladimir P. TARAKANOV	1622