

Monday Morning, 2 June 2003
8:15 am – Crystal Ballroom

Opening :

Welcome to ICOPS 2003

Prof. Kyu-Sun Chung
Hanyang University

A Message of Congratulations

Vice Minister Oh Kab Kwon
Minister of Science and Technology, Korea

Keynote Address:

Expanding the Frontier of Plasma Research

President KunMo Chung
Hoseo University

Plenary Session:

**Update of the Review on the Business and Technological
Progress of Plasma Display Panel**

Dr. Byung Hak Lee
Samsung SDI Co., Ltd.

Chair: Prof. Han S. Uhm, *Ajou University*

Monday Morning, 2 June 2003
10:00 am – Crystal Room I

Oral Session 1A: 1.1 Basic Phenomena (I)

Chair: I. Alexeff, *University of Tennessee*

- 1A01 **A Plausible Non-thermal Plasma Effect on Shock Waves**
S.P. Kuo and D. Bivolaru
Polytechnic University, Brooklyn, NY, USA
- 1A02 **Sensitive Measurement of Electric Field in a Collisionless dc Sheath by Laser-Induced Fluorescence-Dip Spectroscopy**
K. Sasaki and K. Takizawa
Nagoya University, Nagoya, Japan
- 1A03 **Temporal Development of Pulsed Streamer Discharges in Water**
S. Katsuki, K. Shiraki, D. Hemmert¹, H. Bluhm², and H. Akiyama
Kumamoto University, Kumamoto, Japan
¹*Texas Tech University, Lubbock, TX, USA*
²*Research Center Karlsruhe, Karlsruhe, Germany*
- 1A04 **Charge Transfer in Plasma Processing**
E. Shin and P.T. Murray
University of Dayton, Dayton, OH, USA
- 1A05 **Plasma Diffusion by Coulomb Collisions in Two-Dimensional Maps**
G. Park and C.S. Chang
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 1A06 **EEDF and Plasma Parameters in a Spherical ICP**
V.A. Godyak and B.M. Alexandrovich
Osram Sylvania, Beverly, MA, USA

Monday Morning, 2 June 2003
10:00 am – Crystal Room II

**Oral Session 1B : 2.5 NonFusion Microwave Plasmas
2.6 Microwave Plasmas**

Chair: M. Thumm, *Karlsruhe University*
N. Yugami, *Utsunomiya University*

- 1B01-02 **Invited – 24-84GHz Gyrotron Systems for Technological Microwave Application**
A.A. Bogdashov, Yu.V. Bykov, G.G. Denisov, A.G. Ereemeev, M.Yu. Glyavin,
G.I. Kalynova, V.V. Kholoptsev, A.G. Luchinin, I.V. Plotnikov, V.E. Semenov,
and N.A. Zharova
Institute of Applied Physics, Nizhny Novgorod, Russia
- 1B03-04 **Invited – The Role of Plasma in Microwave Systems for Materials Processing**
M. Willert-Porada, T. Gerdes, J. Grosse-Berg, and H.S. Park
University of Bayreuth, Bayreuth, Germany
- 1B05-06 **Invited – Microwave Innovation for Industrial Composite Fabrication - The HEPHAISTOS Technology**
L. Feher¹, P. Pozzo¹ and M. Thumm^{1,2}
¹*Forschungszentrum Karlsruhe, Karlsruhe, Germany*
²*Universitaet Karlsruhe, Karlsruhe, Germany*
- 1B07-08 **Invited – On the Theory of Electron Beam-Wave Interactions In a Magnetized Plasma Waveguides**
L. Shenggang
University of Electronic Science and Technology of China, Chengdu, China
- 1B09 **Dual CVD-PECVD Microwave Powered Fluidized Bed Reactor**
R. Tap and M. Willert-Porada
University of Bayreuth, Bayreuth, Germany
- 1B10 **Improving Plasma Characteristic and Depositing High-Quality Diamond Film in Surface Wave Plasma CVD**
J. Kim and M. Katsurai
University of Tyoko, Tokyo, Japan

Monday Morning, 2 June 2003
10:00 am – Crystal Room III

Oral Session 1C: 5.1 Low Pressure Plasma Processing (I)

Chair: P. D. Pedrow, *Washington State University*

- 1C01-02 **Invited – Dependence of Trench Charging on the Velocity Distribution of Ions Incident of a SiO₂ Wafer**
T. Yagisawa and T. Makabe
Keio University, Yokohama, Japan
- 1C03 **50nm Scale Etching of Si and SiO₂ with the Low Angle Forward Reflected Neutral Beam**
D.H. Lee, S.D. Park, S.J. Jung, and G.Y. Yeom
Sungkyunkwan University, Suwon, Korea
- 1C04 **Wavelet-Based Neural Network Prediction of Plasma Etch Profile Nonuniformity**
B. Kim, S. Kim, and K. Kim
Sejong University, Seoul, Korea
- 1C05 **The Simple Model for Ion-Assisted Etching Using Cl₂ /Ar Inductively Coupled Plasma**
A.M. Efremov^{1,2}, D.P. Kim², and C.I. Kim²
¹*Ivanovo State University of Chemistry & Technology, Ivanovo, Russia*
²*Chung-Ang University, Seoul, Korea*
- 1C06 **Dry Etching of GaAs-Based Semiconductors in High-Density Planar Inductively Coupled BCl₃ Plasmas**
J.W. Lee, W.T. Lim, I.G. Baek, G.S. Cho, K.S. Cho¹, and S.J. Pearton²
Inje University, Gimhae, Korea,
¹*Clotek, Inc., Bucheon, Korea,*
²*University of Florida, Florida, USA*
- 1C07 **Surface Contaminants Cleaning Characteristics of Etched Si Wafer in SF₆ ICP**
B.J. Chun, H.J. Song, and K.S. Lee
Yeungnam University, Gyeongsan, Korea
- 1C08 **Effects of Temperature on the Etching Properties of Bi_{4-x}La_xTi₃O₁₂ Thin Films**
D.P. Kim, K.T. Kim, and C.I. Kim
Chung-Ang University, Seoul, Korea
- 1C09 **Magnetic Enhanced Inductively Coupled Plasma Etching of 6H-SiC**
D.W. Kim, H.Y. Lee, H.S. Kim, Y.J. Sung¹, S.H. Chae¹, and G.Y. Yeom
Sungkyunkwan University, Suwon, Korea
¹*Samsung Advanced Institute of Technology, Suwon, Korea*
- 1C10 **Optimization and Comparison of Argon Plasma-Induced Quantum Well Intermixing Using RIE and ICP**
D. Leong and L.K. Ang
Nanyang Technological University, Nanyang, Singapore

Monday Morning, 2 June 2003
10:00 am – Pearl Room

Oral Session 1D: 5.5 Flat Panel Displays

Chair: K. W. Whang, *Seoul National University*

- 1D01-02 **Invited – Two-Dimensional Measurements of the Structure of PDP Micro-Discharge Plasmas Using Laser Thomson Scattering**
S. Hassaballa, S. Suzuki, Y.K. Kim, K. Uchino, and K. Muraoka
Kyushu University, Kasuga, Japan
- 1D03 **Influence of Wall Charge Configurations Prior to Addressing Discharge on Dynamic Margin in AC Plasma Display Panel**
Y. Jung, J.H. Choi, S.B. Kim, K.B. Jung, E.H. Choi, and H.S. Uhm¹
Kwangwoon University, Seoul, Korea
¹*Ajou University, Suwon, Korea*
- 1D04 **Firing and Sustaining Discharge Characteristics in Alternate Current Micro-Discharge Cell with Three Electrodes**
H. Kim and H.S. Tae
Kyungpook National University, Daegu, Korea
- 1D05 **Comparison of Electric Field and Priming Particle Effects on Address Discharge Time Lag in AC PDP and Addressing Characteristics of High Xe Contents Panel**
J.S. Kim, J.H. Yang, T.J. Kim, and K.W. Whang
Seoul National University, Seoul, Korea
- 1D06 **Luminous Efficacy of Kr Mixtures at 6" AC-PDP**
Y.M. Kim, H. Hatanaka, S.H. Son, S.H. Jang, G.Y. Kim, H.B. Park, J.H. Hong, K.D. Kang¹, C.K. Yoon¹, E.K. Heo¹, and M.S. Yoo¹
Samsung Advanced Institute of Technology, Suwon, Korea
¹*Samsung SDI, Chonan, Korea*
- 1D07 **Control of Initial Wall Charges for Multi-Luminance of AC-Plasma Display Panel**
B.G. Cho, H.S. Tae, and S.I. Chien
Kyungpook National University, Daegu, Korea
- 1D08 **Measurement of Ion Induced Secondary Electron Emission Coefficient (γ) and Work Function of Vacuum Annealed MgO Protective Layer in AC PDP**
J.Y. Lim, J.S. Oh, H.S. Jeong, J.M. Jeoung, E.H. Choi, and H.S. Uhm¹
Kwangwoon University, Seoul, Korea
¹*Ajou University, Suwon, Korea*
- 1D09 **Influence of Auxiliary Discharges on a Multi-Lamps Backlight for Large Area LCD TVs**
G. Cho, Y.S. Kim, D.H. Lee, J.W. Lee, J.W. Hong, D.W. Yang, Y.G. Kim, J.G. Kang, B.S. Kim, E.H. Choi and H.S. Uhm¹
Kwangwoon University, Seoul, Korea
¹*Ajou University, Suwon, Korea*

Monday Morning, 2 June 2003
10:00 am – Ruby Room

**Oral Session 1E: 7.1 Breakdown
7.2 Switching**

Chair: W. Jiang, *Nagaoka University of Technology*

- 1E01-02 **Invited – Vacuum Arc Plasma Jets and Their Applications**
M. Keidar and I.I. Beilis¹
University of Michigan, Ann Arbor, MI, USA
¹*Tel Aviv University, Tel Aviv, Israel*
- 1E03 **Influence of Magnetic Field on the Electrical Breakdown Properties in Cylindrical Diode**
S.Z. Li and H.S. Uhm
Ajou University, Suwon, Korea
- 1E04 **Physical Aspects of a Selfblast Generator Circuit Breaker for Currents up to 190 kA**
M. Claessens, T. Schoenemann, J. Kiefer, L. Zehnder and A. Steffens¹
ABB Switzerland Ltd, Zrich, Swiss
¹*Corporate Research, Baden-Dattwil, Swiss*
- 1E05 **DC Arc Extinction Using External Magnetic Field in Switching Device**
H.K. Cho and E.W. Lee¹
LG Industrial System Ltd. Co, Cheongju, Korea
¹*Chung-nam National University, Daejeon, Korea*
- 1E06 **Noble Crowbar Circuit for Compact 50 kJ Capacitor Bank**
Y.S. Jin, H.S. Lee, J.S. Kim, Y.B. Kim and G.H. Rim
Korea Electrotechnology Research Institute, Changwon, Korea
- 1E07 **The Development of Low Frequency RF Generator for Dry Scrubber**
S.S. Kim and D.K. Choi¹
Seoul National University of Technology, Seoul, Korea
¹*New Power Plasma Co. Seoul, Korea*
- 1E08 **The Transformer Scheme of Current Zero and its Break in Technology of Combined Opening Switch (Vacuum Interrupter and POS)**
O.G. Egorov
Troitsk Institute for Innovation and Fusion Research, Moscow, Russia

Monday Morning, 2 June 2003
10:00 am – Emerald Room

Poster Session 1PA01 - 45: 1.2 Space Plasmas
1.3 Partially Ionized Gases
1.4 Computational Plasma Physics
1.5 Dusty Plasmas

1PA01 – 1PA03: 1.2 Space Plasmas

- 1PA01 **Nonlinear Wave Interaction in a Self-Gravitating Fluid**
J. Vranješ and S. Poedts
Center for Plasma Astrophysics, Leuven, Belgium
- 1PA02 **Evidence for An Intense Aurora Recorded in Antiquity**
A.L. Peratt
Los Alamos National Laboratory, Los Alamos, NM, USA
- 1PA03 **The Origin of Petroglyphs-Recordings of a Catastrophic Aurora in Human Prehistory?**
D. Scott and A.L. Peratt¹
University of Massachusetts, Amherst, MA, USA
¹*Los Alamos National Laboratory, Los Alamos, NM, USA*

1PA04-1PA25: 1.3 Partially Ionized Ionized Gases

- 1PA04 **Analysis of the Discharge Modes of Atmosphere Dielectric Barrier Discharges of Helium, Argon and Nitrogen**
J. Zhang, C. Ren, D. Wang, and Y. Wang
Dalian University of Technology, Dalian, China
- 1PA05 **Characterization of a New Dielectric Barrier Discharge Plasma Using Spectral Data**
Y.H. Yan, X.P. Feng, Z.G. Li, and X.L. Tang
Dong Hua University, Shanghai, China
- 1PA06 **Self-Consistent Simulation of Diffuse Nonthermal Atmospheric Helium Discharges**
J.J. Shi and M.G. Kong
Loughborough University, Loughborough, UK
- 1PA07 **Production of Large-Scaled Atmospheric-Pressure Plasma by Capacity- Coupled Multi-Discharge**
T. Fujiwara, T. Miura, K. Takaki, H. Mase¹, and N. Sato²
Iwata University, Morioka, Japan
¹*Ibaraki University, Hitachi, Japan*
²*Tohoku University, Sendai, Japan*
- 1PA08 **Study of an Atmospheric-Pressure Dielectric Barrier Discharge Developed for Large Area Material Processing**
S.Y. Moon, B.K. Kang, Y.K. Lee, and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 1PA09 **O₂-gas Flow-Rate Effect on the Atmospheric Dielectric Barrier Discharge Plasma**
B.C. Jang, Y.H. Kim, and G.H. Kim¹
Hanyang University, Ansan, Korea
¹*Seoul National University, Seoul, Korea*
- 1PA10 **Space Charge Effects in a Dielectric Barrier Discharge**
Y.H. Kim, T. Lho, D.C. Suk, B.J. Lee, S.J. Yoo, S.H. Kim¹, and J.S. Yoo²
Korea Basic Science Institute, Daejeon, Korea

¹*Sem Technology, Seoul, Korea*

²*Korea Advanced Institute of Science & Technology, Daejeon, Korea*

- 1PA11 **Measurements of the Electron Density and Collision Frequency of a One Atmosphere Uniform Glow Discharge Plasma (OAUGDPTM) Generated in a Parallel Plate Reactor**
Y. Yang, J.R. Roth, and M.K. Howlader
University of Tennessee, Knoxville, TN, USA
- 1PA12 **Laser Initiation and Radiofrequency Sustainment of High Pressure Plasmas**
K. Akhtar, J. Scharer, S. Tysk, and M. Denning
University of Wisconsin, Madison, WI, USA
- 1PA13 **Atmospheric Pressure Glow Discharge Micro-Plasma Jet**
A.A.H. Mohamed, F. Leipold, J. Kolb, S. Kono, and K.H. Schoenbach
Old Dominion University, Norfolk, VA, USA
- 1PA14 **Downstream Instabilities of Ar/SF₆ Inductive Plasma Discharges**
M. Tuszewski, S.P. Gary, R.R. White, and G.A. Wurden
Los Alamos National Laboratory, Los Alamos, NM, USA
- 1PA15 **A Study on the Characteristic of Discharge Tube for Ozone Generation**
K.H. Cho, Y.B. Kim, and H.S. Lee
Korea Electrotechnology Research Institute, Changwon, Korea
- 1PA16 **A Possible Application of the Non-Uniform Electric Field Measurement Using Pockels Effect in GIS (Gas Insulated Switchinggear)**
J.Y. Koo, C.H. Ryu and Y.M. Chang
Hangyang University., Seoul, Korea
- 1PA17 **Two-Dimensional Simulation of a Corona Discharge Plasma in Air at Atmospheric Pressure**
W.H. Koh and I.H. Park¹
Hanseo University, Seosan, Korea
¹*University of Incheon, Incheon, Korea*
- 1PA18 **Development of Atmospheric Dielectric Barrier Discharge System for Industrial Application**
Y.S. Choi¹, K.S. Chung¹, and M.J. Lee^{1,2}
¹*Hanyang University, Seoul, Korea*
²*PlaGen Inc., Seoul, Korea*
- 1PA19 **Effect of Non-Thermal Plasma on Flame**
J.B. Lee and J. Hwang¹
Korea Institute of Industrial Technology Evaluation & Planning, Seoul, Korea
¹*Yonsei University, Seoul, Korea*
- 1PA20 **Measurement of Electron Energy Distribution in an Asymmetric Capacitive Coupled Plasma**
G.Y. Kwak, J.S. Ahn, B.K. Lee, Y.S. Choi, and K.S. Chung
Hanyang University, Seoul, Korea
- 1PA21 **Influence of Magnetic Field on Ionization in Low Pressure Argon Plasma**
A.V. Kozyrev and D.S. Vershinin
Institute of High Current Electronics, RAS, Tomsk, Russia
- 1PA22 **Investigation on a Non-Diaphragm Type Shock Tube for the Study of Gas-Dynamic Lasers**
S. Imada and K.N. Sato
Kyushu University, Kasuga, Japan

- 1PA23 **Oxygen Radical Density Measurement in O₂-N₂ Gas Mixture Plasma by Means of a Platinum Made Thin Wire Sensor**
N. Haraki, S. Ono, and S. Teii
Musashi Institute of Technology, Tokyo, Japan
- 1PA24 **Study of Dielectric Barrier Discharge under Atmospheric Condition**
Y.C. Peng, Y.X. Zhou¹, J. Wang, L. Shu, P. Yan, G.S. Sun, and S.C. Zhang
Chinese Academy of Science, Beijing, China
¹*Tsinghua University, Beijing, China*
- 1PA25 **Electrical Characteristics of a 13.56MHz Glow Discharge Generated in Atmospheric Helium**
J.J. Shi and M.G. Kong
Loughborough University, Loughborough, UK
- 1PA26-1PA38: 1.4 Computational Plasma Physics**
- 1PA26 **Molecular Dynamics Simulations of Plasma-Surface Interactions of Si and GaN**
J.W. Kang, W.Y. Choi, J.J. Seo, and H.J. Hwang
Chung-Ang University, Seoul, Korea
- 1PA27 **Simulation of Directional Si Etch with Various Neutral Beam Angle Distributions**
S.J. Kim, H.S. Park, Y.Q. Wu, J.K. Lee, D.H. Lee¹, and G.Y. Yeom¹
Pohang University of Science and Technology, Pohang, Korea
¹*Sungkyunkwan University, Suwon, Korea*
- 1PA28 **Computational Study of SF₆/Ar Plasma at Low Pressure Etch Regime**
V.I. Kolobov and V.V. Kudriavtsev¹
CFD Research Coporation, Huntsville, AL, USA
¹*CFD CANADA, Toronto, Canada*
- 1PA29 **A New Method for Fluid Simulation of High-Density Plasma Discharge**
H. Choe, S.S. Kim¹, and N.S. Yoon²
Samsung Electronics Co. LTD., Yongin, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*
²*Chungbuk National University, Cheongju, Korea*
- 1PA30 **3D Fluid Simulation of Rectangular TCP Source**
N.S. Yoon, J.H. Kim¹, and Y.H. Shin¹
Chungbuk National University, Cheongju, Korea
¹*Korea Research Institute of Standards and Science, Daejeon, Korea*
- 1PA31 **Analysis of Heating Mechanisms in Capacitively-Coupled Plasma using PIC Simulation**
H.C. Kim, O. Manuilenko, T.R. Chung, J.K. Lee, and J.W. Shon¹
Pohang University of Science and Technology, Pohang, Korea
¹*LAM Research Corporation, CA, USA*
- 1PA32 **Three-Dimensional Nonlocal Heating Model of Planer-Type Inductively Coupled Plasma with Rectangular Geometry**
S.B. Song, N.S. Yoon¹ and H.Y. Lee
Samsung SDI, Yongin, Korea
¹*Chungbuk National University, Cheongju, Korea*
- 1PA33 **Kinetic Simulations of Capacitively Coupled Plasmas**
V. Kolobov and R. Arslanbekov
CFD Research Corporation, Huntsville, AL, USA
- 1PA34 **New PDP Cell Structures for High Luminous Efficiency and Comparison of the Simulation Results with Experimental Electron Density and Excited Xe Species**
S.W. Ko, S.S. Yang, H.C. Kim and J.K. Lee

- 1PA35 **Numerical Modeling of the Dielectric Barrier Glow Discharge in Atmospheric-Pressure Helium with Oxygen Impurities**
D. Lee, J.M. Park, S.H. Hong, and Y. Kim¹
Seoul National University, Seoul, Korea
¹*Korea Institute of Machinery and Materials, Daejeon, Korea*
- 1PA36 **Effect of Rate of Current Rise on the Discharge Uniformity: a Two-dimensional Simulation**
Yu.I. Bychkov, S.A. Yampolskaya and A.G. Yastremsky
High Current Electronics Institute, RAS, Tomsk, Russia
- 1PA37 **Studies of Electron with He using the Schwinger Variational Principle**
J.L.S. Lino, A. Eiras, G.G.Z. Torres and C.E. Picaza
Universidade Braz Cubas, São Paulo, Brazil
- 1PA38 **The Characteristics of Magnetically Enhanced large Area Processing Plasmas**
B.U. Cho, S.E. Park, J.K. Lee, Y.J. Lee¹ and G.Y. Yeom¹
Pohang University of Science and Technology, Pohang, Korea
¹*Sungkyunkwan University, Suwon, Korea*
- 1PA39-1PA45: 1.5 Dusty Plasmas**
- 1PA39 **Effect of an AC-Modulated Cathode on Particle Trap in a Dusty DC Discharge**
S. Park, C.R. Seon, and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 1PA40 **Spatial Distribution of Dust Particles Around the Trapping Region in a DC Dusty Plasma**
C.R. Seon, S. Park, and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 1PA41 **EHD in Dusty and Dirty Plasmas and in Unconventional Plasmas Particularly Involving Discharge and Ionization Distinct from HD and MHD**
H. Kikuchi
Institute for Environmental Electromagnetics, Tokyo, Japan
- 1PA42 **Interactions of Magnetized Dust Particles in Complex Plasmas**
S.V. Vladimirov^{1,2}, V.V. Yaroshenko², G.E. Morfill², and D. Samsonov²
¹*University of Sydney, Sydney, Australia*
²*Max Planck Institute, Garching, Germany*
- 1PA43 **Ion-Acoustic Waves in a Complex Plasma with Negative Ions**
S.V. Vladimirov^{1,2}, K. Ostrikov^{1,3}, M.Y. Yu⁴, G.E. Morfill²
¹*University of Sydney, Sydney, Australia*
²*Max Planck Institute, Garching, Germany*
³*Nanyang Technological University, Nanyang, Singapore*
⁴*Ruhr-University Bochum, Bochum, Germany*
- 1PA44 **Oscillatory Modes of Magnetized Grains in a Plasma**
S.V. Vladimirov^{1,2}, N.F. Carner¹, G.E. Morfill² and V.V. Yaroshenko²
¹*University of Sydney, Sydney, Australia*
²*Max Planck Institute, Garching, Germany*
- 1PA45 **A Simple Model of Ball Lightning**
I. Alexeff, M. Thiagarajan, S. Parameswaran and M. Grace
University of Tennessee, Knoxville, TN, USA

Monday Morning, 2 June 2003
10:00 am – Charlotte Room

Poster Session 1PB01-28: 2.1 Intense Beam Microwave Devices
2.2 Fast Wave Devices
2.3 Vacuum Microelectronics
2.4 Slow Wave Devices

1PB01-1PB03: 2.1 Intense Beam Microwave Devices

- 1PB01 **A Diode Design Study of the Virtual Cathode Oscillator with Ring-Type Reflector**
W.J. Jeon, K.Y. Sung, S.H. Chung, K.B. Song, Y. Jung, M.C. Choi, E.H. Choi,
and M. Kristiansen¹
Kwangwoon University, Seoul, Korea
¹*Texas Tech University, Lubbock, TX, USA*
- 1PB02 **Influence of Anode-Cathode Gap Distance on Output Characteristics of High Power Microwave from Coaxial Virtual Cathode Oscillator**
K.Y. Sung, W. Jeon, S.H. Chun, K.B. Song, Y. Jung, M.C. Choi, and E.H. Choi
Kwangwoon University, Seoul, Korea
- 1PB03 **Radiation Pattern of High Power Microwave from Axially Extracted Virtual Cathode Oscillator**
K.B. Song, Y. Jung, K.Y. Sung, W. Jeon, K.B. Jung, S.H. Chun, and E.H. Choi
Kwangwoon University, Seoul, Korea

1PB04-1PB11: 2.2 Fast Wave Devices

- 1PB04 **Time-Dependent Behavior of the Gyrotron Backward-Wave Oscillator**
S-H. Chen, T.H. Chang¹, K.F. Pao², C.T. Fan², and K.R. Chu²
National Center for High-Performance Computing, Hsinchu, Taiwan
¹*National Center for Theoretical Science, Hsinchu, Taiwan*
²*National Tsing Hua University, Hsinchu, Taiwan*
- 1PB05 **Preparation of a 17 GHz Gyrokystron for Accelerator Driver Experiments**
W. Lawson, B. Hogan, K. Bharathan, S. Gouveia, and V.L. Granatstein
University of Maryland, College Park, MD, USA
- 1PB06 **Space-Charge Limited Magnetron Injection Guns (MIGs) for Gyro-devices**
W. Lawson
University of Maryland, College Park, MD, USA
- 1PB07 **High Power Microwave Experiments of Gyrokystron Amplifier and Backward Wave Oscillator**
J.J. Choi, Y.H. Na, R.B. Jang and S.H. Yoon
Kwangwoon University, Seoul, Korea
- 1PB08 **Ka-Band Second-Harmonic Cusp Gun Gyro-TWT Amplifier**
S.B. Harriet¹, D.B. McDemott, D.A. Gallagher², and N.C. Luhmann,
Jr. *University of California, Davis, CA, USA*
¹*Also NSWC Crane, Crane, IN, USA*
²*Northrop Grumman Corp, Rolling Meadows, IL, USA*
- 1PB09 **Cusp Gun Driven 34 GHz Peniotron**
L.J. Dressman¹, D.B. McDemott, Y. Hirata, D.A. Gallagher², T.A. Spencer³,
and N.C. Luhmann Jr.
University of California, Davis, CA, USA
¹*Also NSWC Crane, Crane, IN, USA*
²*Northrop Grumman Corp., Rolling Meadows, IL, USA*
³*Air Force Research Lab, Kirtland AFB, NM, USA*

1PB10 **Nonlinear Dynamics and Chaos of a Relativistic Backward-Wave Oscillator**
N.M. Ryskin and V.N. Titov¹
Saratov State University, Saratov, Russia
¹ *Seoul National University, Seoul, Korea*

1PB11 **Surface Integral Equation Analysis of Gyrotron Quasi-Optical Launchers using the Multi Level Fast Multipole Method**
J. Neilson and R. Bunger¹
Calabazas Creek Research, Saratoga, CA, USA
¹ *Weyhe, Germany*

1PB12: 2.3 Vacuum Microelectronics

1PB12 **The Small and Large Signal Analyses of the LIGA base W-band Coupled Cavity TWT**
Y.M. Shin, G.S. Park, G. Caryotakis¹, and B. Arfin²
Seoul National University, Seoul, Korea
¹ *Stanford Linear Accelerator Center, Menlo Park, CA, USA*
² *Arfin Associates*

1PB13-1PB28: 2.4 Slow Wave Devices

1PB13 **Analysis of a Large-Orbit Backward Wave Oscillator**
Y. Choyal, T. Watanabe¹, K. Minami and V.L. Granatstein²
Niigata University, Niigata, Japan
¹ *National Institute for Fusion Science, Toki, Japan*
² *University of Maryland, College Park, MD, USA*

1PB14 **Observation of Non-Axisymmetric Mode Radiation from Oversized Backward Wave Oscillators**
K. Ogura, R. Yoshida, H. Yamazaki, K. Komiyama, and M. Sakurai
Niigata University, Niigata, Japan

1PB15 **Non-Axisymmetric Instabilities of Axially Streaming Electron Beam in Periodically Corrugated Cylindrical Waveguide**
H. Yamazaki, K. Ogura, O. Watanabe¹ and Y. Yamashita
Niigata University, Niigata, Japan
¹ *Fukui University, Fukui, Japan*

1PB16 **Study on High-Power CW Magnetrons for Industrial Applications**
S.S. Jung, Y.S. Jin, and H.S. Lee
Korea Electrotechnology Research Institute, Changwon, Korea

1PB17 **Density Modulation of the Thin Slab Beam over a Metal Grating**
Y.K. Lim, H.J. Lee, S.O. Cho¹, B.C. Lee², and Y.U. Jeong²
Hanyang University, Seoul, Korea
¹ *Korea Advanced Institute of Science and Technology, Daejeon, Korea*
² *Korea Atomic Energy Research Institute, Daejeon, Korea*

1PB18 **Thermal and Structural Analysis on Output Coupler of Helix-TWT**
H.S. Kim^{1,2}, H.S. Uhm^{1,2} and S.W. Baek³
¹ *Institute for Advanced Engineering, Yongin, Korea*
² *Ajou University, Suwon, Korea*
³ *LG Electronics, Seoul, Korea*

- 1PB19 **Manufacturing and Measurement of Heavily-Loaded Helix Traveling Wave Tube**
H.S. Kim^{1,2}, H.S. Uhm^{1,2} and G.S. Park³
¹*Institute for Advanced Engineering, Yongin, Korea*
²*Ajou University, Suwon, Korea*
³*Seoul National University, Seoul, Korea*
- 1PB20 **The Performance Characteristics of Ka-band Extended Interaction Klystron based on 2π -Mode Operation**
Y.M. Shin, G.S. Park, G. Caryotakis¹, G.P. Scheitrum¹ and B. Arfin²
Seoul National University, Seoul, Korea
¹*Stanford Linear Accelerator Center, Menlo Park, CA, USA*
²*Arfin Associates*
- 1PB21 **Helix Traveling Wave Tube Performance Optimization Through Circuit Tapering**
Y.D. Joo, A. K. Sinha¹, and G.S. Park,
Seoul National University, Seoul, Korea
¹*Central Electronics Engineering Research Institute, Pilani, India*
- 1PB22 **Design of Low Energy Backward Wave Oscillator**
D.H. Kim, V.N. Titov, Y.B. Kang, and G.S. Park
Seoul National University, Seoul, Korea
- 1PB23 **Analysis of a Novel Brazed Helix Tape Slow Wave Structure with High Power Capability**
Y. Gong, Y. Wei, W. Wang, and Z. Daun
University of Electronics Science and Technology of China, Chengdu, China
- 1PB24 **LATTE/MUSE Numerical Suite: An Open Source Teaching and Research Code for Traveling Wave Tube Amplifiers**
J.G. Wöhlbier, M.C. Converse, J. Plouin¹, A. Rawal², A. Singh,
and J.H. Booske
University of Wisconsin, Madison, WI, USA
¹*Ecole Polytechnique – Palaiseau, France*
²*Malaviya Nat'l Inst. Tech., Jaipur, India*
- 1PB25 **Injection Schemes for TWT Linearization**
A. Singh, J.G. Wöhlbier, J.E. Scharer, and J.H. Booske
University of Wisconsin, Madison, WI, USA
- 1PB26 **Plasma Assistance Diffraction Generator**
I.N. Onishchenko, E.A. Kornilov, O.F. Kovpik, and V.O. Podobinsky
Kharkov Institute of Physics & Technology, Kharkov, Ukraine
- 1PB27 **High-Frequency Characteristic Investigation of X-Band Five-Unit TTTO**
D. Chen, H. He, and Q. Liu
China Academy of Engineering Physics, Mian Yang, China
- 1PB28 **Excitation and Amplification of the Microwaves in a Plasma Filled Slow Wave Structure**
L. Gupta, P. Vyas, Y. Choyal, K.P. Maheshwari, and K.C. Mittal¹
Davi Ahilya University, Indore, India
¹*Bhabha Atomic Research Centre, Mumbai, India*

Monday Afternoon, 2 June 2003
1:30 pm – Crystal Ballroom

Plenary Session:

New Physics in Radio Frequency Plasma Sources

Prof. Francis F. Chen
University of California, Los Angeles

**Subsonic Plasma Aerodynamics Using a One Atmosphere Uniform
Glow Discharge Plasma (OAUGDPTM)**

Prof. J. Reece Roth
University of Tennessee, Knoxville

Chair: Prof. Akira Hirose, *University of Saskatchewan*

Monday Afternoon, 2 June 2003
3:30 pm – Crystal Room I

Oral Session 2A: 1.1 Basic Phenomena (II)

Chair: M. Rader, *University of Tennessee*

- 2A01-02 **Invited – Dynamics of a Charged Particle in Linearly Polarized Traveling Wave, Hamiltonian Approach to Laser-Matter Interaction at Very High Intensities**
A. Bourdier and D. Patin
CEA/DAM Ile-de-France, Bruyères-le-châtel, France
- 2A03 **Development of Analysis-algorithm of Langmuir Probe Trace Using Wavelet Transform**
B.K. Park, D.K. Kim, G.H. Kim¹
Hanyang University, Ansan, Korea,
¹*Seoul National University, Seoul, Korea*
- 2A04 **Plasma Technologies and Their Computer Simulations**
E.E. Son, F.M. Gaisin and A.V. Zibarov
Moscow Institute of Physics and Technology, Moscow, Russia
- 2A05 **Harmonic Generation and Superthermal Tail Formation during Beam-Plasma Interaction**
P. H. Yoon¹, and H.S. Uhm
¹*University of Maryland, College Park, MD, USA*
Ajou University, Suwon, Korea
- 2A06 **High Harmonic Excitations in Relativistic Electron Beam Propagation**
H.S. Uhm, H.S. Kim and P.H. Yoon¹
Ajou University, Suwon, Korea
¹*University of Maryland, College Park, MD, USA*
- 2A07-08 **Invited – Nonideal Plasma Under Extreme Conditions Generated by Shock Waves**
V.E. Fortov
Institute for High Energy Density Physics, RAS, Moscow, Russia
- 2A09 **Simulations of Ion Transport in a Collisional Radio-Frequency Plasma Sheath**
Y.N. Wang and Z.L. Dai
Dalian University of Technology, Dalian, China

**Monday Afternoon, 2 June 2003
3:30 pm – Crystal Room II**

**Oral Session 2B: 2.1 Intense Beam Microwave Devices
2.3 Vacuum Microelectronics**

2.1 Intense Beam Microwave Devices

Chair: T. Spencer, *Air Force Research Laboratory*

- 2B01-02 **Invited – Mode Control in Relativistic Magnetrons and Noise Mechanisms in kW Magnetrons**
R.M. Gilenbach, M.R. Lopez, V.B. Neculaes, M.C. Jones, W.M. White, Y.Y. Lau, P. Pengvanich, M.D. Johnston, T.S. Strickler, T.A. Spencer¹, J.W. Luginsland², M.D. Haworth¹, K.L. Cartwright¹, P.J. Mardahl¹, T.A. Murphy¹, and D. Price³
University of Michigan, Ann Arbor, MI, USA
¹*Air Force Research Laboratory, Kirtland AFB, NM, USA*
²*SAIC*
³*Titan Corporation*
- 2B03 **Power Efficiency Enhancement of a Coaxial Virtual Cathode Oscillator with Ring-type Reflector**
E.H. Choi, K.Y. Sung, W.Jeon, S.H. Chun, K.B. Song, Y. Jung, M.C. Choi, and H.S. Uhm¹
Kwangwoon University, Seoul, Korea
¹*Ajou University, Suwon, Korea*
- 2B04 **Experimental Results of a 2GW Vircator**
J.J. Mankowski, E.H. Choi, J.C. Dickens, X. Chen, and M. Kristiansen
Texas Tech University, Lubbock, TX, USA
- 2B05-06 **Invited – High Power Microwave Generation by Virtual Cathode Oscillator**
W. Jiang, M. Sato, N. Shimada, S.D. Prasad, and K. Yatsui
Nagaoka University of Technology, Nagoya, Japan

2.3 Vacuum Microelectronics

Chair: J. H. Booske, *University of Wisconsin-Madison*

- 2B07 **Micro-Electromechanical Systems and Field Emission Array Cathodes for High Frequency RF Sources**
R.L.Ives, C. Kory, M. Read, J. Booske¹, and C. Spindt²
Calabazas Creek Research Inc., Saratoga, CA, USA,
¹*University of Wisconsin, Madison, WI, USA*
²*SRI International, Menlo Park, CA, USA*
- 2B08 **A Quantum Model of 1D and 2D Child-Langmuir Law**
L.K. Ang
Nanyang Technological University, Nanyang, Singapore
- 2B09 **Folded Waveguide Traveling Wave Tube Sources for THz Radiation**
S. Bhattacharjee, J.H. Booske, C.L. Kory¹, D.W. van der Weide, S. Limbach, S. Gallagher, A. Stevens, M. Genack, J. Welter, M. Lopez², R.M. Gilgenbach², J. Wohlbiel, R.L. Ives³, M.E. Read³, R. Divan⁴ and D.C. Mancini⁴
University of Wisconsin, Madison, WI, USA
¹*Analex/NASA Glenn Research Center, Cleveland, OH, USA*
²*University of Michigan, Ann Arbor, MI, USA*
³*Calabazas Creek Research, Inc., Saratoga, CA, USA*
⁴*Argonne National Laboratory, Argonne, IL, USA*

Monday Afternoon, 2 June 2003
3:30 pm – Crystal Room III

Oral Session 2C: 5.1 Low Pressure Plasma Processing (II)

Chair: P. D. Pedrow, *Washington State University*

- 2C01-02 **Invited – Development of a Slot-Excited Planar Microwave Discharge Device for Uniform Plasma Processing**
Y. Yasaka, N. Ishii¹, T. Yamamoto², M. Ando³, and M. Takahashi⁴
Maizuru National College of Technology, Kyoto, Japan
¹*Tyoko Electron Ltd., Amagasaki, Japan*
²*Yamagata University, Yonezawa, Japan*
³*Tokyo Inst. Technol., Tokyo, Japan*
⁴*Tokyo University A & T, Koganei, Japan*
- 2C03 **Design of HDP CVD Ceramic Liners for Plasma Sources**
W. Cheng, V. Kudriavtsev¹, and V. Kolobov²
MechComp. Inc., Sunnyvale, CA, USA
¹*CFD Canada, Ontario, Canada*
²*CFD Research Corporation, Huntsville, AL, USA*
- 2C04 **Development of In-Situ Plasma Density Monitoring Method in Inductively Coupled Plasma**
J.H. Cho, M.J. Jung, and G.H. Kim¹
Hanyang University, Ansan, Korea
¹*Seoul National University, Seoul, Korea*
- 2C05 **RF Power Distribution for Helicon Plasma Injectors Operating in a Mode-Transition Regime with Parallel Connection**
S.H. Han, J.A. Park, Y.J. Kim, and Y. Hwang
Seoul National University, Seoul, Korea
- 2C06 **Integrated Reactor and Feature Scale Analysis of Plasma Enhanced Semiconductor Fabrication Processes**
J.V. Cole and V.I. Kolobov
CFD Research Corporation, Huntsville, AL, USA
- 2C07 **Design and Performance of a 120 kV, 40 kW Plasma Ion Implantation Facility**
S.A. Nikiforov, J.H. Kim, S.V. Shenderoy, G.H. Rim, and J. Kim
Korea Electrotechnology Research Institute, Changwon, Korea
- 2C08 **Sheath Expansion Dynamics During Plasma Implantation of Insulating Materials**
X.B. Tian^{1,2}, R.K.Y. Fu², S.Q. Yang¹, and P.K. Chu²
¹*Harbin Institute of Technology, Harbin, China*
²*City University of Hong Kong, Hong Kong, China*
- 2C09 **High Temperature Oxidation Resistance of TiAl Alloys by Plasma Based Ion Implantation**
T. Ishii, K. Murakami, K. Fujita, and Y. Hibino
Ion Engineering Research Institute Corporation, Osaka, Japan

Monday Afternoon, 2 June 2003
3:30 pm – Pearl Room

Oral Session 2D: 1.5 Dusty Plasmas

Chair: Osamu Ishihara, Yokohama National University

- 2D01-02 **Invited – Fine-Particle Collection Controlled by Electrostatic Potential Configuration in Plasmas**
N. Sato and T. Koshimizu¹
Tohoku University, Sendai, Japan
¹*Hitachi Kokusai Electric Inc., Sendai, Japan*
- 2D03 **Dust Formation due to Interactin between H₂ Plasma and Carbon Wall**
K. Koga, R. Uehara, M. Shiratani, Y. Watanabe, and A. Komori¹
Kyushu University, Fukuoka, Japan
¹*National Institute for Fusion Science, Toki, Japan*
- 2D04 **Dynamics of a Dust Particulate in Ion Flow with Magnetic Field**
M. Shindo, T. Yamanouchi, and O. Ishihara
Yokohama National University, Yokohama, Japan
- 2D05-06 **Invited – Wakes of Plasma Flowing around Dust Grains**
S.V. Vladimirov, O. Ishihara¹, S.A. Maiorov², and N.F. Cramer
University of Sydney, Sydney, Australia
¹*Yokohama National University, Yokohama, Japan*
²*Institute of General Physics, RAS, Moscow, Russia*
- 2D07 **New Instabilites in Magnetized Dusty Plasma with No spherical Grains**
J. Mahmoodi, H. Zahed¹, and S. Sobhanian²
University of Qom, Qom, Iran
¹*Sahand University of Technology, Tabriz, Iran*
²*Tabriz University, Tabriz, Iran*
- 2D08 **Self-Excitd Nonlinear Oscillations of Dust Particles in Small Assemblies**
C.M. Ticos, A. Dyson, and P.W. Smith
Oxford University, Oxford, UK

Monday Afternoon, 2 June 2003
3:30 pm – Ruby Room

**Oral Session 2E: 7.4 Compact Pulsed Power Sources
7.5 Pulsed Power Applications**

Chair: H. Bluhm, *Research Center Karlsruhe*

- 2E01-02 **Invited – Studies of Ceramic Dielectrics for use in High Power, Pulsed Power Transmission Lines**
E. Schamiloglu, J. Gaudet, M. Roybal, M. Joler, and C. Christodoulou
University of New Mexico, Albuquerque, NM, USA
- 2E03-04 **Invited – Blue Light Emission from Silicon Nanosized Powders Prepared by Ion-Beam Evaporation**
H. Suematsu, M. Gunji, T. Arikado, W. Jiang, and K. Yatsui
Nagaoka University of Technology, Nagaoka, Japan
- 2E05 **Arc Discharge Application to Sewage Sludge Treatment System**
H.Y. Lee, H.N. Choi, Y.J. Jung, H.S. Uhm, B.K. Kang¹, and S. M. Hong²
Ajou University, Suwon, Korea
¹*KAIST, Daejeon, Korea*
²*Daewoo E&C Co., LTD. Suwon, Korea*
- 2E06 **Variants of Applying Plasma Wave Systems in Air-Jet Engines and Chemical Lasers**
K.V. Korytchenko, M.A. Krasnogolovets, A.N. Dovbnya, and Yu.Ya. Volkolupov
Kharkiv Tank Institute of National Technical University, Kharkiv, Ukraine
- 2E07 **Improved Discharge Current Control Performance in Wire-Cut Electric Discharge Machines Using Switching Power Supplies**
I.W. Jeong, J.S. Kim, M.V. Pavlovets, H.S. Lee, G.H. Rim, and B.W. Lee¹
Korea Electrotechnology Research Institute, Changwon, Korea
¹*Daewoo Heavy Industries & Machinery Ltd, Changwon, Korea.*
- 2E08 **Compact Pulsed Power Generators for Industrial Applications**
W. Jiang, K. Yatsui, N. Shimizu¹, K. Iida¹, and A. Tokuchi²
Nagaoka University of Technology, Nagaoka, Japan
¹*NGK Insulator, Ltd, Nagoya, Japan*
²*Nichicon Corporation, Shiga, Japan*

Monday Afternoon, 2 June 2003
3:30 pm – Emerald Room

**Poster Session 2PA01-59: 3.1 Plasma, Ion and Electron Sources
5.5 Flat Panel Displays**

2PA01-2PA29: 3.1 Plasma, Ion and Electron Sources

- 2PA01 **Monte Carlo Simulation of Ion Movement in Plasma Beam of Stationary Plasma thruster**
Yu.A. Ermakov^{1,2} and W.K. Choi²
¹*Moscow Institute of Radio Engineering, Electronics & Automation (Technical University), Moscow, Russia*
²*Korea Institute of Science and Technology, Seoul, Korea*
- 2PA02 **Dense Plasma Formation on the Surface of a Ferroelectric Cathode**
K. Chirko, A. Sayapin, Ya.E. Krasik, and J. Felsteiner
Technion-Israel Institute of Technology, Haifa, Israel
- 2PA03 **Plasma Source Based on Arc Discharge with Cold Hollow Cathode**
Yu.H. Akhmadeev, S.V. Grigoriev, N.N. Koval, I.V. Lopatin, P.M. Schanin, and D.S. Vershinin.
Institute of High Current Electronics, Tomsk, Russia
- 2PA04 **Anode Plasma Effects on Relativistic Field-Emission-Limited Diodes**
M.C. Lin, Y.C. Lan, J.Y. Hsu, H.M. Chung¹, and D.S. Chuu¹
National Center for High-Performance Computing, Hsinchu, China
¹*Department of Electrophysics, Hsinchu, China*
- 2PA05 **Discharge Improvement with hf Field of Plasma Generated by an Electron Beam**
M. Sugawa, S. Utsunomiya¹, T. Maehara, and R. Sugaya
Ehime University, Matsuyama, Japan
¹*Matsuyama Shinonome Junior College, Matsuyama, Japan*
- 2PA06 **Soft X-Ray Generation after Arc Extinction of a Low-Current, Repetitive Discharge**
T. Yanagidaira, H. Abiko, H. Miura, and K. Tsuruta
Ibaraki University, Hitachi, Japan
- 2PA07 **Study on Magnetized Inductively Coupled Plasma with Nagoya III Antenna**
J.H. Cho, J.A. Park¹, Y.S. Hwang¹, and G.H. Kim¹
Hanyang University, Ansan, Korea
¹*Seoul National University, Seoul, Korea*
- 2PA08 **Inductively Coupled Plasma Etching of Glass Using an Embedded Cold Cathode Electron Beam Assist**
K. Hoshimiya¹, R. Ravi, Z. Yu, J.D. Williams, and G.J. Collins
Colorado State University, Fort Collins, CO, USA
¹*Ushio Inc, Japan*
- 2PA09 **Development of Low Power 13.56 Mhz Plasma Source Family**
A.F. Alexandrov¹, G.E. Bugrov, I. Kerimova¹, S.G. Kondranin, E.A. Kralkina, V.B. Pavlov, V.Yu. Plaksin¹, A.A. Rukhadze¹, and K.V. Vavilin.
Plasma Tech. Co., Ltd, Songnam, Korea
¹*Moscow State University, Moscow, Russia*
- 2PA10 **Applications of the Electron-Beam Plasma**
M.N. Vasiliev and A.H. Mahir
Moscow Institute of Physics and Technology, Moscow, Russia

- 2PA11 **Influence of the Excitation Frequency and Discharge Current on Atmosphere Pressure Plasmas for Modification of Material Surfaces**
L. Xia and X.P. Feng
Dong Hao University, Shanghai, China
- 2PA12 **High-Power Pulse-Modulated Helium ICP for Analytical Excitation/Ionization Source**
H. Yabuta, H. Miyahara, M. Watanabe, E. Hotta, and A. Okino
Tokyo Institute of Technology, Yokohama, Japan
- 2PA13 **RF Atmospheric Pressure Micro-Plasma in a 35 cm Long Hollow Slot Electrode**
Z. Yu, R. Ravi, K. Hoshimiya, and G. Collins
Colorado State University, Fort Collins, CO, USA
- 2PA14 **The Status of H-Ion Source Development for Korea Multipurpose Accelerator Complex**
G.H. Lee, I.S. Hong, J.A. Park, and Y.S. Hwang
Seoul National University, Seoul, Korea
- 2PA15 **Negative Ion Density Distribution in a Volume Negative Ion Source - Its Dependence on Plasma Parameters-**
S. Mori, Y. Tauchi, O. Fukumasa, M. Hamabe¹, and Y. Takeiri²
Yamaguchi University, Ube, Japan
¹*Chubu University, Japan*
²*National Institute for Fusion Science, Toki, Japan*
- 2PA16 **Control of Plasma Parameters in RF Negative Ion Sources**
Y. Tauchi and O. Fukumasa
Yamaguchi University, Ube, Japan
- 2PA17 **Feasibility study of H-Ion Source Using Compact Helicon Plasma Source**
J.A. Park, I.S. Hong, G.H. Lee, and Y.S. Hwang
Seoul National University, Seoul, Korea
- 2PA18 **Beam Energy Enhancement Studies in a Plasma Sputter-Type Negative Ion Source**
M.L. Yambot, A.O. Ubarro, and H.J. Ramos
University of Philippines, Quezon, Philippines
- 2PA19 **Development of ECR Negative Ion Sources**
K. Fujioka and O. Fukumasa.
Yamaguchi University, Ube, Japan
- 2PA20 **Design of a 14 GHz min-B Electron Cyclotron Resonance Ion Source for Heavy Ion Accelerator in Korea Cancer Center Hospital**
H.J. You, K.S. Chung, and J.S. Chai¹
Hanyang University, Seoul, Korea
¹*Korea Cancer Center Hospital, Seoul, Korea*
- 2PA21 **Pulsed Proton Beam Generation from ECR Plasma**
S.I. Moon, Y.S. Bae, J.W. Choi, S.B. Kim, W. Namkung, and M.H. Cho
Pohang University of Science and Technology, Pohang, Korea
- 2PA22 **Development of a Compact Helicon Ion Source for a Neutron Generator**
H.D. Jung, M.J. Park, S.H. Kim, and Y.S. Hwang
Seoul National University, Seoul, Korea

- 2PA23 **Initial Beam Extraction Results of a Prototype Long Pulse Ion Source for the KSTAR NBI Heating System**
D.H. Chang, C.S. Seo, Y.W. Jun, B.H. Oh, S.H. Jeong, K.W. Lee, and S.R. In
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PA24 **Emittance and Divergence Evolutions of Ion Beams Extracted from High Flux Laser Plasma**
M. Nakajima, M. Asahina, J. Hasegawa, M. Ogawa, and K. Horioka.
Tokyo Institute of Technology, Yokohama, Japan
- 2PA25 **Improvement of the TOF Measurement for Impulse Vacuum Arc Metal Ions**
K. Tsuruta, Y. Manabe, and T. Yanagidaira.
Ibaraki University, Hitachi, Japan
- 2PA26 **Measurement of Ion and Neutral Beam Energy Distribution by Using a Neutral Particle Analyzer**
D.C. Kim, S.J. Yoo, B.J. Lee, T. Lho, Y.H. Kim, D.C. Suk, G.H. Kim¹, J.S. Kim²
M.Y. Song², and M. Jung³
Korea Basic Science Institute, Daejeon, Korea
¹*Seoul National University, Seoul, Korea*
²*Hanyang University, Ansan, Korea*
³*Pohang University of Science & Technology, Pohang, Korea*
- 2PA27 **The Knee of the Transition from TL to FSCL Operation: Space Charge Effects on Thermionic Emission**
M.C. Lin, Y.C. Lan, J.Y. Hsu, H.M. Chung¹, and D.S. Chuu¹
National Center for High-Performance Computing, Hsinchu, China
¹*National Chiao Tung University, Hsinchu, China*
- 2PA28 **Study of the Hollow Cathode Plasma Electron-Gun**
Z. Yonghui, J. Jinsheng, and C. Anbi
China Academy of Engineering Physics, Mian Yang, China
- 2PA29 **Inductively Coupled Plasma Etching with Supplementary Electron Beam Injection**
K. Hoshimiya¹, R. Ravi, Z. Yu, C. Richardson², and G.J. Collins
Colorado State University, Fort Collins, CO, USA.
¹*Ushio Inc, Japan*
²*LSI Logic Corp., Fort Collins, CO, USA.*
- 2PA30-2PA59: 5.5 Flat Panel Displays**
- 2PA30 **Nanoporous Plasma Electrodes for Flat Lamp**
S.J. Park, J.H. Cho, S.S. Kim, H.S. Kim, and K.W. Lee
Myongji University, Yongin, Korea
- 2PA31 **Measurement of Excited Xe (1s)₄ Atoms versus Various Xe Contents to Ne Gases in AC-PDP by Laser Absorption Spectroscopy**
P.Y. Oh, D.K. Park, J.C. Ahn¹, Y. Jung, G.S. Cho, S.O. Kang, H.S. Uhm², and E.H. Choi
Kwangwoon University, Seoul, Korea
¹*Kyoto University, Kyoto, Japan*
²*Ajou University, Suwon, Korea*
- 2PA32 **The Characteristics of External Electrode Fluorescent Lamps**
B.S. Kim, M.R. Cho, S.M. Hong, J.H. Chun, J.G. Kang, S.B. Kim, E.H. Choi, M.M. Kim¹, J.S. Ko¹, U.W. Lee¹, S.C. Yang¹, H.S. Uhm², and G. Cho
Kwangwoon University, Seoul, Korea
¹*Mokpo National University, Mokpo, Korea*
²*Ajou University, Suwon, Korea*

- 2PA33 **Influence of Address Voltage in a Surface-Discharge Alternating-Current Plasma Display Panel**
 J.C. Ahn¹, Y. Shintani, K. Tachibana, and T. Sakai
Kyoto University, Kyoto, Japan
¹*Display Research Laboratories, Co. Ltd, Tokyo, Japan*
- 2PA34 **Comparison of the Simulation Results with Measured Excited Xe Specie Density in Plasma Display Panel Cell**
 S.S. Yang, H.C. Kim, S.W. Ko, and J.K. Lee
Pohang University of Science & Technology, Pohang, Korea
- 2PA35 **Measurement of Electron Temperature and Plasma Density in Coplanar AC Plasma Display Panels**
 I.R. Cho, M.W. Moon, C.G. Ryu, M.C. Choi, and E.H. Choi
Kwangwoon University, Seoul, Korea
- 2PA36 **New-Shaped Electrode for AC-PDP for Enhancement of Luminous Efficiency in AC-PDP**
 J.H. Choi, S.B. Kim, Y. Jung, K.B. Jung, G.S. Cho, and E.H. Choi
Kwangwoon University, Seoul, Korea
- 2PA37 **Electro-Optical Characteristics in Accordance with Dielectric Thickness of AC-PDP**
 S.B. Kim, J.G. Koo, H.S. Lee, B.C. Kim, S.W. Park, K.B. Jung¹, J.H. Choi¹, Y. Jung¹, and E.H. Choi¹
UPD Corporation, Icheon, Korea
¹*Kwangwoon University, Seoul, Korea*
- 2PA38 **Optimization of Three-Component Gas Ne-Xe-Kr for High Efficiency Plasma Panel**
 T. Kim, S.U. Kwon, and H.J. Hwang
Chung-Ang University, Seoul, Korea
- 2PA39 **A Study of the New Penning Gas Mixture, He-Ne-Xe-Kr-Ar for the Improvement of the Luminous Efficiency in AC Plasma Display Panel**
 J.K. Lee, S.J. Lee, and H.J. Hwang
Chung-Ang University, Seoul, Korea.
- 2PA40 **A Study of the Discharge Improvement for the Lamp Wave in Address Period**
 S.J. Lee, J.K. Lee, and H.J. Hwang
Chung-Ang University, Seoul, Korea
- 2PA41 **Characteristics and Diagnostics of Horizontal Long Column Plasma Display Panel**
 W.K. Min, J. Kang, S.C. Choi, J.B. Park, J.W. Song, J.K. Yoo, and M.H. Park
LG Electronics Inc., Seoul, Korea
- 2PA42 **Measurement of Wall Voltage in Reset Discharge of Plasma Display Panel**
 K.D. Park, Y. Jeung, C.G. Ryu, J.H. Choi, S.B. Kim, P.Y. Oh, S.H. Jeon, and E.H. Choi
Kwangwoon University, Seoul, Korea
- 2PA43 **Diagnostics of Plasma on PDP by Optical Emission Spectroscopy**
 K.W. Park, H.I. Park, T.I. Lee, and H.K. Baik
Yonsei University, Seoul, Korea
- 2PA44 **Impedance and Crosstalk of Plasma Display Panel**
 S.B. Song, P.Y. Park, G.G. Lee, J.H. Lee, and H.Y. Lee
Samsung SDI, Yongin, Korea

- 2PA45 **An Analysis on the Discharges in the Reset Period of RMSP (Ramp Biased Multiple Short Pulse) Method of AC PDP**
J.H. Yang, H.S. Bae, J.S. Kim, J.C. Jeong, and K.W. Whang
Seoul National University, Seoul, Korea
- 2PA46 **Observation of Surface Change by Plasma in Plasma Display Panel (PDP)**
S.H. Cho, H. Soh, and Y.C. Kim
Hanyang University, Seoul, Korea
- 2PA47 **Deterioration of MgO Layer in a Plasma Display Panel**
Y.M. Sung, M. Wada, M. Otsubo, and C. Honda
Miyazaki University, Miyazaki, Japan
- 2PA48 **Measurement of Ion-Induced Secondary Electron Emission Coefficient for MgO Thin Film with Plasma Treatment**
H.S. Jeong, J.S. Oh, J.Y. Lim, W.B. Park, J.W. Cho, and C.H. Choi
Kwangwoon University, Seoul, Korea
- 2PA49 **Development of an MgO Sputtering System for the Plasma Display Panel**
Y.W. Choi and J.H. Kim
Korea Electrotechnology Research Institute, Changwon, Korea
- 2PA50 **Influence of MgO Geometrical Surface Profiles on the Secondary Electron Emission Coefficient (γ) in AC-PDP**
W.B. Park, J.S. Oh, H.S. Jeong, J.J. Jeong, J.Y. Lim, J.W. Cho, and E.H. Choi
Kwangwoon University, Seoul, Korea
- 2PA51 **Potentiality of BN Thin Film as a Protective Layer in Plasma Display Panels**
S.H. Lee, K.T. Kim, J.K. Kim, E.S. Byon, and G.H. Lee
Korea Institute of Machinery and Materials, Changwon, Korea
- 2PA52 **Characteristic of ITO and MgO Surfaces after Pin-to-Plate Type Atmospheric Plasma Treatment Using CDA**
C.H. Jeong, C.H. Yi, B.J. Park, and G.Y. Yeom
Sungkyunkwan University, Suwon, Korea
- 2PA53 **Large Area ICP Assisted Inline Magnetron Sputtering System Development for Flat Panel Displays**
J.H. Joo
Kunsan National University, Kunsan, Korea
- 2PA54 **Effects of Multipolar Magnetic Fields of the Internal Straight Antenna in Inductively Coupled Plasma**
Y.J. Lee, K.N. Kim, B.W. Cho¹, J.K. Lee¹, and G.Y. Yeom
Sungkyunkwan University, Suwon, Korea
¹*Pohang University of Science & Technology, Pohang, Korea*
- 2PA55 **Hot-Wire CVD Grown Microcrystalline Silicon Films with and without Initial Growing Layer Modification by Inductive Coupled Plasma**
D.Y. Kim, S.I. Moon, C.K. Seo, and J.S. Yi
Sungkyunkwan University, Suwon, Korea
- 2PA56 **Characteristics of an Atmospheric Pressure Plasma and its Application to FPD Fabrication Processes**
J.H. Pyo, Y.S. Oh, and T.K. Lee
SE Plasma, Inc., Anyang, Korea.

- 2PA57 **Evaluation of Influence of Effective Electrons Masses on Current-Voltage Characteristics of Metal TIP-Emitters with Superthin Diamond Coats**
R.M. Novosad, V.V. Il'chenko, L.G. Il'chenko, and Yu.V. Kryuchenko
Kiev National University, Kiev, Ukraine
- 2PA58 **Field Electron Emission from Graphite Fiber**
E. Chen, J. Zhang, and Z.T. Yang
Yunnan University, Kunming, China
- 2PA59 **Simulation of the Field Emission Characteristics from Multi-Walled Carbon Nanotubes in a Triode Configuration**
Y. Hu, T.L. Lin, and C.H. Huang
National Tsing Hua University, Hsinchu, Taiwan

Monday Afternoon, 2 June 2003
3:30 pm – Charlotte Room

Poster Session 2PB01-35: 2.5 Non-Fusion Microwave Systems
2.6 Microwave Plasmas
3.2 Intense Electron and Ion Beams

2PB01: 2.5 Non-Fusion Microwave Systems

- 2PB01 **Sintering of High-Quality Ceramics Using a Compact Gyrotron System**
H. Hoshizuki, T. Kuroda, S. Mitsudo, T. Idehara, M. Glyavin¹, A. Ereemeev¹,
F. Tanahashi, T. Honda, and Y. Iwai
Fukuï University, Fukuï, Japan
¹*Institute of Applied Physics, RAS, Nizhny Novgorod, Russia*

2PB02-2PB15: 2.6 Microwave Plasmas

- 2PB02 **Microwave Plasma Jet for Material Processing of High Temperature Ceramics**
A.I. Al-Shamma'a, W.R. Wylie, and J. Lucas
University of Liverpool, Liverpool, UK
- 2PB03 **Theoretical Modeling and Experimental Results of a Low Pressure Microwave UV Lamp for Biological Applications**
A.I. Al-Shamma'a, I. Pandithas, J.D. Cullen, J. Lucas, and J.J. Lowke
University of Liverpool, Liverpool, UK
- 2PB04 **Generation of Ion Wave Streamers by the Resonance Absorption due to Nonlinear Interaction of Microwave-Plasma**
M.K. Al-Hassan, M. Starodubtsev, H. Ito, N. Yugami, and Y. Nishida
Utsunomiya University, Utsunomiya, Japan
- 2PB05 **Resonance Absorption in the Surface Wave Plasma**
T. Omaru, F. Komiyama, and S. Kogoshi
Tokyo University of Science, Noda, Japan
- 2PB06 **Mode Analysis and Self Ducting of High Power Microwaves in Preformed Density Channels**
C. Rajyaguru, H. Ito, N. Yugami, and Y. Nishida
Utsunomiya University, Utsunomiya, Japan
- 2PB07 **Low Frequency Sheath Instability Stimulated by the Resonant Absorption of a Short Microwave Pulse**
M. Starodubtsev, Md.K. Al-Hassan, H. Ito, N. Yugami, and Y. Nishida
Utsunomiya University, Utsunomiya, Japan
- 2PB8 **Development of 2.45 GHz Waveguide-Based Air Torch System**
Y.S. Bae, W.C. Lee, Y.R. Choi, Y.H. Lee, W. Namkung, and M.H. Cho
Pohang University of Science and Technology, Pohang, Korea
- 2PB9 **Microwave Assisted Plasma Generation from a Hybrid Coaxial TE₀₁₁ Resonator**
R.B. Jang, H.S. Kim, J.J. Choi, Y.S. Hwang¹, and W.H. Choe²
Kwangwoon University, Seoul, Korea
¹*Seoul National University, Seoul, Korea*
²*Korea Advanced Institute of Science and Technology, Daejeon, Korea*
- 2PB10 **Plasma Frequency Selective Surface**
T. Anderson, I. Alexeff¹, and J. Reynolds
ASI Techonology Corporation, Henderson, NV, USA
¹*University of Tennessee, Knoxville, TN, USA*

- 2PB11 **A Millimeter Wave Beam Shaping Phased Antenna Array Proposed for Imaging Reflectometry**
C.C. Chang, C.W. Domier, N.C. Luhmann, Jr., H. Park¹, and T. Munsat¹
The University of California, Davis, CA, USA,
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 2PB12 **Plasma Transparency at Microwave Frequencies**
M.S. Hur, J.S. Wurtele, and G. Shvets
University of California, Berkeley, CA, USA
- 2PB13 **Using External Magnetic Field Inhomogeneities to Guide Microwaves in Plasma Waveguides**
M.S. Hur and J.S. Wurtele
University of California, Berkeley, CA, USA
- 2PB14 **Nonlocal Electron Kinetics in Microwaves Discharge**
N.A. Azarenkov, V.I.V. Gushchin, and V.V. Gushchin.
"V.N. Karazin" National University, Kharkov, Ukraine
- 2PB15 **Microwave Plasma in The Humid Air**
E.T. Protasevich
Tomsk Polytechnic University, Tomsk, Russia
- 2PB16-2PB35: 3.2 Intense Electron and Ion Beams**
- 2PB16 **Effect of Dissipation on Excitation of the Beam Wave with Negative Energy**
E.V. Rostomyan
National Ac. Sci.of Armenia, Ashtarak, Armenia
- 2PB17 **Beam Line Design and Simulation for Mass Separation of Beryllium Isotopes at the AMS Facility in Korea**
C.C. Yun, C.S. Lee, M. Youn¹, and J.C. Kim¹
Chung-Ang University, Seoul, Korea
¹*Seoul National University, Seoul, Korea*
- 2PB18 **Perveance Characteristics of Intense Electron Beams in High Power Cylindrical diodes**
K.Y. Sung, W. Jeon, S.H. Chun, K.B. Song, Y. Jung, M.C. Choi, E.H. Choi, and H.S. Uhm¹
Kwangwoon University, Seoul, Korea
¹*Ajou University, Suwon, Korea*
- 2PB19 **The Emittance Evolution of 3 MV Injector**
Z. Dai, W. Wang, K. Zhang, and S. Chen
CAEP, Sichuan, China
- 2PB20 **Generation of Enhanced Pulsed Electron Beams by a Pulse Charge Mode Multi-Gap Pseudospark for Material Processing**
Y.K. Kwon, S.H. Nam, S.S. Park, S.H. Kim, H. Heo, and Y.J. Han
Pohang University of Science and Technology, Pohang, Korea
- 2PB21 **Emittance, Energy and Beam Profile Measurements on the 3.5MeV Injector Using Optical Cerenkov Radiation**
S. Chen, J. Deng, K. Zhang, and Z. Dai.
CAEP, Sichuan, China
- 2PB22 **Effects of Low-Energy Electron Irradiation on the Conversion Efficiency of Solar Cells**
S.O. Chang, S.O. Cho, J.P. Yun¹, and I.S. Cha¹
Korea Advanced Institute of Science and Technology, Daejeon, Korea
¹*Dongshin University, Naju, Korea*

- 2PB23 **Deuteron Beam Production in a 3kJ Plasma Focus Device**
S.L. Yap and C.S. Wong
University of Malaya, Kuala Lumpur, Malaysia
- 2PB24 **Study of Micro Structure and Electrical Properties of Ion Implanted Polymer**
J.S. Lee and J.H. Lee
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB25 **Test Facility of Proton Beam Utilization of PEFP at SNU-AMS Tandem Accelerator**
K.R. Kim and K.Y. Nam
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB26 **Development of the Low Energy Proton Accelerator for the Proton Engineering Frontier Project**
J.M. Han, H.J. Kwon, J.H. Chang, S.H. Han, M.Y. Park, K.T. Seol, K.K. Jeong, Y.J. Kim, J.H. Na, Y.S. Cho, and B.H. Choi
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB27 **Beam Profile Measurement for PEFP LEBT**
S.H. Han, J.M. Han, and Y.S. Cho
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB28 **Design of RF Input Coupler for the PEFP RFQ Accelerator**
K.K. Jeong, J.M. Han, and K.T. Seol
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB29 **RF Field Measurements of a 0.45MeV RFQ Linac**
J.H. Na, Y.J. Kim, and J.M. Han
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB30 **The Low Level RF System for Proton LINAC of PEFP**
K.T. Seol, H.J. Kwon, J.M. Han, I.H. Yu¹, J.S. Yang¹, M.H. Chun¹, and Y.J. Han¹
Korea Atomic Energy Research Institute, Daejeon, Korea
¹*Pohang Accelerator Laboratory, Pohang, Korea*
- 2PB31 **Beam Dynamics Study of a 20 MeV DTL for PEFP**
J.H. Jang, Y.S. Cho, H.J. Kwon, J.M. Han, and B.H. Choi
Korea Atomic Energy Research Institute, Daejeon, Korea
- 2PB32 **Design and Construction of a Compact Neutron Generator Using an RF Ion Source**
M.J. Park, S.H. Kim, H.D. Jung, and Y.S. Hwang
Seoul National University, Seoul, Korea
- 2PB33 **Inertial Electrostatic Confinement for Fusion Applications**
J. Park, R.A. Novel, C.P. Munson, W.G. Rellergert, and M.D. Sekora
Los Alamos National Laboratory, Los Alamos, NM, USA
- 2PB34 **Optimum Plasma Lens for Focussing of High-Current Ion Beams**
V.I. Maslov, A.A. Goncharov¹, and I.N. Onishchenko
NSC Kharkov Institute of Physics and Technology, Kharkov, Ukraine
¹*NASU, Kiev, Ukraine*
- 2PB35 **Spatial and Time Dynamics of Non-Linear Vortices in High-Current Plasma Lens**
V.I. Maslov, A.A. Goncharov¹, I.N. Onishchenko, V.L. Stomin, and V.N. Tretyakov²
Kharkov Institute of Physics and Technology, Kharkov, Ukraine
¹ *NASU, Kiev, Ukraine*
²*Karazin Kharkov National University, Kharkov, Ukraine*

Tuesday Morning, 3 June 2003
8:15 am – Crystal Ballroom

Plenary Session:

The Physics of Lightning

Dr. John J. Lowke

CSIRO Telecommunications and Industrial Physics

Chair: Prof. Robert Fedosejevs, *University of Alberta*

Tuesday Morning, 3 June 2003
9:30 am – Crystal Room I

Oral Session 3A: 1.3 Partially Ionized Gases (I)

Chair: S. J. Kim, *Korea Institute of Machinery and Material*

- 3A01-02 **Invited – Measurement and Kinetic Analysis of Ozone and OH Radicals in Pulsed Corona Discharge Plasma**
R. Ono and T. Oda
University of Tokyo, Tokyo, Japan
- 3A03-04 **Invited – Analysis of Streamers in Pulsed Corona and Dielectric Barrier Discharges**
Y. Kim, Y.H. Song, S.J. Kim, J.M. Park¹, W.S. Kang¹, and S.H. Hong¹
Korea Institute of Machinery & Materials, Daejeon, Korea
¹*Seoul National University, Seoul, Korea*
- 3A05 **Rotational Temperature and Density Measurements of NO Molecules Generated by Pulsed Streamer Discharge**
G. Yamada, S.B. Han, and T. Oda
University of Tokyo, Tokyo, Japan
- 3A06-07 **Invited – Wide Range Two-Dimensional Imaging of NO Density in a Non-Thermal Plasma Reactor by LIF Technique**
S. Kanazawa, T. Sumi, S. Shimamoto, T. Ohkubo, Y. Nomoto, J. Mzeraczyk¹, and J.S. Chang²
Oita University, Oita, Japan
¹*Polish Academy of Sciences, Gdansk, Poland*
²*McMaster University, Hamilton, Canada*
- 3A08 **Light Emission from the Surface of Spike-type Discharge Electrode at Negative Corona Discharge in a Non-Thermal Plasma Reactor**
D. Brocilo, J.S. Chang, and R.D. Findlay
McMaster University, Hamilton, Canada
- 3A09 **Electrohydrodynamically Induced Secondary Flow in Non-Thermal Plasma Reactor and its Effect on Flue Gas NO_x Cleaning**
M. Kocik, J. Mizeraczyk, J. Podliski, J. Dekowski, S. Kanazawa¹, T. Ohkubo¹, and J.S. Chang²
Polish Academy of Sciences, Gdansk, Poland
¹*Oita University, Oita, Japan*
²*McMaster University, Hamilton, Canada*
- 3A10 **Shape Effect of Ferro-Electric Pellet in Packed Bed Non-thermal Plasma Reactor for C₂F₆ Treatments**
K. Takaki, K. Urashima¹, and J.S. Chang¹
Iwata University, Morioka, Japan
¹*McMaster University, Hamilton, Canada*

**Tuesday Morning, 3 June 2003
9:30 am – Crystal Room II**

Oral Session 3B: 2.2 Fast Wave Devices

Chair: **J. J. Choi**, *Kwangwoon University*

- 3B01-02 **Invited – Demonstration of a Wide-Band 94GHz Gyrotryston Amplifier**
M. Blank, P. Cahalan, K. Felch, B.G. Danly¹, B. Levush¹, D. Pershing¹,
K.T. Nguyen¹, and J.P. Calame¹
CPI, Palo Alto, CA, USA
¹*US Naval Research Laboratory, Washington, DC, USA*
- 3B03 **A High Power 140GHz Quasioptical Gyro-TWT**
J.R. Sirigiri, M.A. Shapiro, and R.J. Temkin
MIT Plasma Science and Fusion Center, Cambridge, USA
- 3B04 **Operation Results of a High Harmonic Gyrotron with Axis-Encircling Electron Beam and Permanent Magnet**
T. Idehara, I. Ogawa, S. Mitsudo, Y. Iwata, S. Watanabe, K. Ohashi¹,
H. Kobayashi¹, T. Yokoyama¹, V. Zapevalov², M. Glyavin²,
A. Kuftin², O. Malygin², and S. Sabchevski³,
Fukui University, Fukui, Japan,
¹*Shin-Etsu Chemical Co. Ltd, Fukui, Japan*.
²*Institute of Applied Physics, RAS, Nizhny Novgorod, Russia*
³*Bulgarian Academy of Science, Sofia, Bulgaria*
- 3B05 **Experimental Study on Low-Velocity-Spread Axis-encircling Electron Gun**
S.G. Jeon, C.W. Baik, D.H. Kim, B. Jia, G.S. Park, N. Sato¹, and K. Yokoo¹
Seoul National University, Seoul, Korea
¹*Tohoku University, Sendai, Japan*
- 3B06 **Experimental Verification of Frequency Multiplication in Two-stage Tapered Gyro-TWT**
C.W. Baik, S.G. Jeon, D.H. Kim, A.K. Sinha¹, N. Sato¹, K. Yokoo¹, and G.S. Park
Seoul National University, Seoul, Korea,
¹*Tohoku University, Sendai, Japan*
- 3B07 **A 2MW, 170 GHz Coaxial Cavity Gyrotron**
B. Piosczyk¹, H. Budig¹, G. Dammertz¹, O. Dumbrajs³, O. Drumm^{1,2}, S. Illy¹
W. Leonhardt¹, M. Schmid¹, and M. Thumm^{1,2}
¹*Institut für Hochleistungsimpuls- und Mikrowellentechnik, Karlsruhe, Germany*
²*Universität Karlsruhe, Karlsruhe, Germany*
³*Helsinki University of Technology, Espoo, Finland*
- 3B08 **Generation of High Mode Purity Output of a Gyrotron and its Conversion to a Gaussian Beam**
Ogawa, H. Nozu, Y. Itakura, T. Idehara, R. Pavlichenko, D. Wagner¹ and M. Thumm²
Fukui University, Fukui, Japan
¹*Max-Planck-Institut, Garching, Germany*
²*Institut für Hochleistungsimpuls- und Mikrowellentechnik, Karlsruhe, Germany*
- 3B09 **10 MW, X- and Ka-Band Gyrotrons**
N.I. Zaitsev, N.S. Ginzburg, E.V. Ilyakov, I.S. Kulagin, V.K. Lygin, V.N. Manuilov,
M.A. Moisey, M.I. Petelin, R.M. Rozental, V.E. Zapevalov, and N.A. Zavolsky
Institute of Applied Physics, RAS, Nizhny Novgorod, Russia
- 3B10 **Stability and Tunability of the Gyrotron Backward-Wave Oscillator**
T.H. Chang, S.H. Chen¹, C.T. Fan², K.F. Pao², L.R. Barnett², and K.R. Chu²
National Center for Theoretical Science, Hsinchu, Taiwan
¹*National Center for High Performance Computing, Hsinchu, Taiwan*
²*National Tsing Hua University, Hsinchu, Taiwan*

Tuesday Morning, 3 June 2003
9:30 am – Crystal Room III

Oral Session 3C: 5.1 Low Pressure Plasma Processing (III)

Chair: R. Fedosejevs, *University of Alberta*

- 3C01-02 **Invited – Use of Neutral Network to Characterize Temperature Effects on Refractive Property of Silicon Nitride Film Deposited by PECVD**
B. Kim, S. Kim, and K. Kim
Sejong University, Seoul, Korea
- 3C03 **Hydrogen Bonding of Low-k Materials Deposited by ICPCVD**
T. Oh, K.-M. Lee, and C.K. Choi
Cheju National University, Jeju, Korea
- 3C04 **A Study of Tetrathiafulvalene (TTF) Doped Plasma-Polymerized Aniline Films**
P.D. Pedrow, M.A. Osman, and K.C. Liddell
Washington State University, Pullman, WA, USA
- 3C05 **RF Plasma Assisted Process for the Deposition of Silicon Carbide Thin Films**
N.I. Cho, S. Vlaskina, and S.J. Noh¹
Sunmoon University, Cheonan, Korea
¹*Dankook University, Seoul, Korea*
- 3C06 **Plasma Diagnostics in Pulsed Plasma Doping System**
B.W. Koo, Z. Fang, L. Godet, J. Scheuer, A. Grouillet¹, D. Lenoble¹, O. Joubert²,
and N. Sadeghi³
Varian Semiconductor Equipment Associates, Gloucester, MA, USA
¹*Central R & D STMicroelectronics Crolles, France*
²*LTM/CNRS, Grenoble, France*
³*Laboratoire de spectrometrie physique UJF, St. Martin D'Herès, France*
- 3C07 **Effects of Metal-Plasma Source Ion Implantation on the Adhesion Strength of DLC film**
J.W. Yi^{1,2}, J.K. Kim¹, E.S. Byon¹, S.C. Kwon¹, and S.S. Kim²
¹*Korea Institute of Machinery & Materials, Changwon, Korea*
²*Kyungpook National University, Daegu, Korea*
- 3C08 **Low Temperature D.C. Plasma CVD Diamond and Diamond-Like Carbon Thin Films**
H.J. Ramos¹, G.M. Malapit^{1,2}, and A. Montecillo¹
¹*University of the Philippines, Quezon City, Philippines*
²*University of the Philippines College, Baguio City, Philippines*

Tuesday Morning, 3 June 2003
9:30 am – Pearl Room

Oral Session 3D: 1.2 Space Plasmas

Chair: O. Ishihara, *Yokohama National University*

- 3D01 **Amplification of Whistler Waves for the Precipitation of Trapped Relativistic Electrons in the Magnetosphere**
S.P. Kuo
Polytechnic University, Brooklyn, NY, USA
- 3D02 **Parametric Variations of Dromion Solutions in Auroral Plasmas**
S.S. Ghosh, A. Sen¹, and G. S. Lakhina
Indian Institute of Geomagnetism, Mumbai, India
¹*Institute for Plasma Research, Gandhinagar, India*
- 3D03 **Fundamental Space Radiation Interactions in New Nanoscale Materials**
S.P. Song, B. Jacobs, V.M. Ayres, M.A. Crimp, R.M. Ronningen, A.F. Zeller,
H. Shaw¹, J. Benevides¹, M. Leibforth², and J. Plante²
Michigan State University, East Lansing, MI, USA
¹*NASA Goddard Space Flight Center, Greenbelt, MD, USA*
²*Dynamic Range Corporation, Bowie, MD, USA*
- 3D04 **Investigation of Interplanetary Transient Plasma Structures and Their Associated Geoeffectiveness**
S.C. Kaushik
Government Arts Science and Commerce College, India

Tuesday Morning, 3 June 2003
9:30 am – Ruby Room

Oral Session 3E: 6.4 Fusion Plasma Diagnostics

Chair: A. Mase, *Kyushu University*

- 3E01-02 **Invited – LHD Diagnostics towards Steady State Operation**
S. Sudo, K. Kawahata, Y. Nagayama, K. Narihara, Y. Hamada, K. Toi, K. Ida,
H. Iguchi, K. Sato, S. Morita, T. Ozaki, A. Nishizawa, K. Tanaka, T. Minami,
Yamada, S. Mutoh, B.B.J. Peterson, M. Emoto, H. Hakanishi, M. Goto, S. Ohdachi,
T. Tokuzawa, T. Ido, M. Toshimuma, S. Sakakibara, and LHD Team
National Institute for Fusion Science, Toki, Japan
- 3E03-04 **Invited – Key Issues in Diagnostics for Burning Plasma Experiments**
A.J.H. Donne and A.E. Costley¹
FOM-Instituut voor Plasmafysica 'Rijnhuizen, Nieuwegein, Netherlands
¹*ITER International Team, Naka, Japan*
- 3E05-06 **Invited – Profile Measurements of Plasma Parameters with a New Type of X-ray Imaging Crystal Spectrometer**
M. Bitter, K.W. Hill, L. Roquemore, S.G. Lee¹, J.G. Bak¹, P. Beiersdorfer², D. Thorn²,
M.F. Gu³, M.K. Moon⁴, U.W. Nam⁵, K.C. Jin⁵, K.N. Kong⁵, and K.I. Seon⁵
Princeton Plasma Physics Laboratory, Princeton, NJ, USA
¹*Korea Basic Science Institute, Daejeon, Korea*
²*Lawrence Livermore National Laboratories, Livermore, CA, USA*
³*MIT, Cambridge, MA, USA*
⁴*Korea Atomic Energy Research Institute, Daejeon, Korea*
⁵*Korea Astronomy Observatory, Daejeon, Korea*
- 3E07 **A Neutronic Analysis of the KSTAR Tokamak**
C.S. Kim
Korea Basic Science Institute, Daejeon, Korea
- 3E08 **Electron Density Profile Measurements on LHD**
K. Kawahata, K. Tanaka, T. Tokuzawa, Y. Ito, T. Akiyama, A. Sanin, A.S. Okajima¹,
S. Iio², and L. Vyacheslavov³
National Institute for Fusion Science, Toki, Japan
¹*Chubu University, Kasugai, Japan*
²*Tokyo Institute for Technology, Tokyo, Japan*
³*Budker Institute of Nuclear Physics, Novosibirsk, Russia*
- 3E09 **FIR Laser Tangential Interferometry/Polarimetry on NSTX**
K.C. Lee, C.W. Domier, M. Johnson, N.C. Luhmann, Jr., and H. Park¹
University of California, Davis, CA, USA
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 3E10 **Electron Cyclotron Emission Diagnostics for Helical Plasma in Large Helical Device**
Y. Nagayama, K. Kawahata, S. Inagaki, S. Kubo, K. Narihara, and the LHD Group
National Institute for Fusion Science, Toki, Japan
- 3E11 **Novel Progress of Zone Plate Coded Imaging Technique**
L.F. Cao, Z.J. Zheng, and Y.K. Ding
China Academy of Engineering Physics, Mianyang, China

Tuesday Morning, 3 June 2003
9:30 am – Emerald Room

Poster Session 3PA01-58: 5.6 Medical, Biological and Environmental Applications

- 3PA01 **Treatment of Ship's Ballast Water in 20t/h System Using Hydroxyl Radical**
X. Zhou, M. Bai, Z. Zhang, X. Bai, B. Yang, and C. Yi
Dalian Maritime University, Dalian, China
- 3PA02 **Decomposition of Gas-Phase Benzene Using Hybrid Systems of Non-Thermal Plasma and Catalysts**
H.H. Kim, Y.H. Lee¹, A. Ogata, and S. Futamura
National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
¹*Pohang University of Science and Technology, Pohang, Korea*
- 3PA03 **SPM (Suspended Particulate Mater) Removal Characteristics from Diesel Exhaust by Corona Discharge and Oil Bath**
Y. Tashiro, H. Teshima, M. Kojima, K. Hitaka, Y. Hayashi, and Y. Yoshioka
Kanazawa Institute of Technology, Nonoichi, Japan
- 3PA04 **Experimental Simulations for Elimination of Biological and/or Chemical Agents**
Y.C. Hong, J. H. Kim, and H. S. Uhm
Ajou University, Suwon, Korea
- 3PA05 **Investigation of Atmosphere Pressure Plasma Discharge and Its Application to Surface Modification of Blood-Filtering Material**
L.X. Tang, P.X. Feng, H.Y. Yan, G.Z. Li, C.Y. Shi, and G. Qiu
Dong Hua University, Shanghai, China
- 3PA06 **A Route to Suppress NO_x of Exhaust by Partial Oxidation of Gasoline in Plasma Process**
Y.X. Yin, X.Y. Dai, J. Li, and S.Y. Shang
Sichuan University, Sichuan, China
- 3PA07 **Investigation of the Removal of Non-Radioactive Corrosion Product Films Using a Low-Pressure Arc**
S. Furukawa, K. Fujiwara¹, K. Adachi, T. Amakawa, and H. Kanbe¹
Central Research Institute of Electric Power Industry, Yokosuka, Japan
¹*Central Research Institute of Electric Power Industry, Komae, Japan*
- 3PA08 **Treatment of HCHO Using Corona Discharge and Pellet Catalysts**
K. Hensel, J. Pawlat¹, K. Takashima¹, and A. Mizuno¹
Comenius University, Bratislava, Slovakia
¹*Toyohashi University of Technology, Toyohashi, Japan*
- 3PA09 **Acetaldehyde Treatment in Foaming Column**
J. Pawlat, K. Hensel¹, C. Yamabe, and A. Mizuno¹
Saga University, Saga, Japan
¹*Toyohashi University of Technology, Toyohashi, Japan*
- 3PA10 **Simultaneous Removal of Fine Particles and Gaseous Pollutants Using Catalyst-Coated Fabric Filter and Discharge Plasma**
B.J. Sung, K. Takashima, S. Katsura, and A. Mizuno
Toyohashi University of Technology, Toyohashi, Japan
- 3PA11 **CF₄ Decomposition Using RF Plasma**
T. Yamamoto, J. Mine, T. Kuroki, and M. Okubo
Osaka Prefecture University, Sakai, Japan

- 3PA12 **Ti(Ta)O₂ Film Fabricated by Magnetron Sputtering and Plasma Immersion Ion Implantation and Deposition: Comparative Study**
J.Y. Chen, Y.X. Leng, P. Yang, G.J. Wan, H. Sun, and J. Wang
Southwest Jiaotong University, Chengdu, China
- 3PA13 **Effects of Plasma Surface Modification on Bioactivity of Titanium in Bone Replacements**
X. Liu^{1,2}, R. Poon¹, C. Ding² and P.K. Chu¹
¹*City University of Hong Kong, Hong Kong, China*
²*Chinese Academy of Science, Shanghai, China*
- 3PA14 **New Plasma Source for Plasma Immersion Ion Implantation**
L.H. Li, R.W.Y. Poon, S.C.H. Kwok, and P.K. Chu
City University of Hong Kong, Hong Kong, China
- 3PA15 **Shadow Effects in Mesh-Assisted Plasma Immersion Ion Implantation of Insulating Materials**
R.K.Y. Fu¹, S.Q. Yang², X.B. Tian^{1,2}, and P.K. Chu¹,
¹*Harbin Institute of Technology, Harbin, China*
²*City University of Hong Kong, Hong Kong, China*
- 3PA16 **In Vivo Blood Compatibility of Titanium Oxide Film Coated Artificial Heart Valves Prepared by Plasma Immersion Ion Implantation and Deposition**
N. Huang, Y.X. Leng, P. Yang, J.Y. Chen, H. Sun, G.J. Wan, and J. Wang
Southwest Jiaotong University, Chengdu, China
- 3PA17 **The Different Properties of Titanium Oxide Biomaterials Grown by Pulse Vacuum Arc Plasma Deposition and Unbalanced Magnetron Sputtering (UBM)**
Y.X. Leng, J.Y. Chen, G.J. Wan, H. Sun, P. Yang, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 3PA18 **Ti-O/Ti-N Biomedical Gradient Films Synthesized by Metal Vacuum Arc Plasma Deposition and Thermal Oxidation**
Y.X. Leng, H. Sun, P. Yang, J.Y. Chen, G.J. Wan, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 3PA19 **A New Plasma Source and Its Application in the Surface Modification of Fabric Materials**
Z.G. Li, X.P. Feng, Y.H. Yen, X.L. Tang, and H.K. Xie
Dong Hua University, Shanghai, China
- 3PA20 **Ti-O Film Deposited by DC Metal Vacuum Arc Deposition: Characteristics and Platelet Adhesion Behavior**
G.J. Wan, Y.X. Leng, H. Sun, P.Y. Yang, J.Y. Chen, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 3PA21 **Surface Modification of Medical Polyurethane by Acetylene Plasma Immersion Ion Implantation**
J. Wang, P. Yang, H. Sun, J.Y. Chen, Y.X. Leng, G.J. Wan, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 3PA22 **A Study of Mechanical Capability and Blood Compatibility of Ti-O/Ti-N Gradient Films Prepared by MPIII-D**
F. Wen, N. Huang, H. Sun, Y. X. Leng, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 3PA23 **Comparative Study of Anti-Thrombotic Behavior Between Nitrogen-Doped and Nitrogen-Free Hydrogenated Amorphous Carbon Films Fabricated by PIII-D**
P. Yang^{1,2}, N. Huang¹, Y.X. Leng¹, S.C.H. Kwok², J.Y. Chen¹,
J. Wang³, Y. Leng³, and P.K. Chu²
¹*Southwest Jiaotong University, Chengdu, China*

²City University of Hong Kong, Hong Kong, China

³Hong Kong University of Science & Technology, Hong Kong, China

3PA24 Structure and Properties of Nitrogen-Doped Hydrogenated Amorphous Carbon Films Fabricated by Plasma Immersion Ion Implantation (PIII)

P. Yang^{1,2}, N. Huang¹, Y.X. Leng¹, S.C.H. Kwok², J.Y. Chen¹,
J. Wang¹, Y. Leng³, and P.K. Chu³

¹Southwest Jiaotong University, Chengdu, China

²City University of Hong Kong, Hong Kong, China

³Hong Kong University of Science & Technology, Hong Kong, China

3PA25 Efficient NO_x Removal Using Silent Discharges and TiO₂ Photocatalyst Simultaneously

A. Katamoto, T. Doi, and S. Kogoshi

Tokyo University of Science, Chiba, Japan

3PA26 High-Speed Ethylene-Oxide Plasma Sterilization System without Toxic Residuals

K. Matsumoto and M. Kanitani

Toyama Prefectural University, Toyama, Japan

3PA27 Application of Secondary Emission Electron Gun for NO_x Treatment

M. Watanabe, P.R. Chalise, A. Okino, K.C. Ko¹, and E. Hotta

Tokyo Institute of Technology, Yokohama, Japan

¹Hanyang University, Seoul, Korea

3PA28 Characteristics of Ozone Production by Intense, Pulsed Relativistic Electron Beam

G. Imada, N. Morishima, and K. Yatsui

Nagaoka University of Technology, Niigata, Japan

3PA29 PACVD of Plasma Polymerized Organic Thin Films and Comparison of their Electrochemical Properties

I.S. Bae, S.H. Cho, M.C. Kim, Y.H. Roh, and J.H. Boo

Sungkyunkwan University, Suwon, Korea

3PA30 Experimental Analysis of Active Species Generated by Atmospheric Plasma

J.H. Choi, E.S. Lee, Y. K. Lee, S. J. Lee¹, K.M. Song², and H.K. Baik

Yongsei University, Seoul, Korea

¹Kyungsung University, Busan, Korea

²Konkuk University, Chungju, Korea

3PA31 Effect of Plasma Source Ion Implantation on the Mechanical Properties of the Trivalent Chrome Layer

E. Byon, J.K. Kim, H.J. Lee, and S.C. Kwon

Korea Institute of Machinery & Materials, Changwon, Korea

3PA32 Interaction between a Non-thermal Plasma and a Flame

M.S. Cha, S.M. Lee¹, K.T. Kim, and S.H. Chung¹

Korea Institute of Machinery & Materials, Daejeon, Korea

¹Seoul National University, Seoul, Korea

3PA33 Experimental Study for Hydrogen Assisted System for Diesel Engine for the Reduction of Exhaust Pollutions

J.O. Chae, G.M. Vasiliev¹, A.M. Knak, N.M. Yeulash, C.M. Lee, and I. C. Choi

Inha University, Incheon, Korea

¹National Academy of Sciences of Belarus, Minsk, Republic of Belarus

3PA34 Decomposition of Volatile Organic Compounds in Plasma Reactor Combining Dielectric Barrier Discharge Plasma with Photocatalyst

Y.R. Choi, Y.H. Lee, Y.M. Kil, K.B. Ko, M.H. Cho, and W. Namkung

Pohang University of Science and Technology, Pohang, Korea

- 3PA35 **Pulsed Plasma Process for the Flue Gas Removal from the Industrial Incinerator Using Peak 200-kV, 10-KA Pulse Modulator**
S.D. Jang, Y.G. Son, J.S. Oh, M.H. Cho, and D.J. Koh¹
Pohang University of Science and Technology, Pohang, Korea
¹*Research Institute of Industrial Science and Technology, Pohang, Korea*
- 3PA36 **Effect of Plasma Pretreatment of Soda-Lime Glass on the Preferred Orientation of TiO₂ Prepared by PECVD**
J. Jhin, P. Kang, K. Kang, and D. Byun
Korea University, Seoul, Korea
- 3PA37 **2-Dimensional Simulation of Corona Discharge Using FEM-FCT Method in Wire-Cylinder Reactor**
H.J. Ju, H.D. Hwang, J.H. Park, and K.C. Ko
Hanyang University, Seoul, Korea
- 3PA38 **Characterization of Platinum Electrode Using UnBalanced Magnetic Field Sputter for Implantable Biomedical Applications**
, H. Lee¹, H.B. Kim¹, T.G. Im², and J.I. Jeong², and S. Ahn^{1,3}
¹*Solco biomedical Co., Ltd, Pyungteak, Korea*
²*Research Institute of Industrial Science & Technology, Pohang, Korea*
³*Seoul National University, Seoul, Korea*
- 3PA39 **Effect of Various Surface Treatment for Enhancing Adhesion of Au on Parylene Coated Protein Chip**
K.S. Hwang^{1,2}, J. H. Lee¹, J. H. Park², and T.S. Kim¹,
¹*Korea Institute of Science and Technology, Seoul, Korea*
²*Korea University, Seoul, Korea*
- 3PA40 **Improvement of Au Adhesion on Parylene-c and SiO₂ Substrates Using Oxygen Plasma Treatment**
J. H. Lee^{1,2,3}, K. S. Hwang², K.H. Yoon³, T.S. Kim², and S. Ahn^{2,4}
¹*Solco biomedical Co. Ltd, Seoul, Korea*
²*Korea Institute of Science and Technology, Seoul, Korea*
³*Yonsei University, Seoul, Korea*
⁴*Seoul National University, Seoul, Korea*
- 3PA41 **Characteristics of Plasma Generation in Air**
K.O. Lee and K.H. Chung
Korea Accelerator and Plasma Research Association, Cheolwon, Korea
- 3PA42 **Effects of NO/NO₂ Ratio on NO_x Removal Efficiency in Plasma Assisted Ammonia SCR Hybrid Process**
Y.H. Lee, Y.R. Choi¹, W.S. Jung, Y.M. Kil, M.H. Cho, and W. Namkung
Pohang University of Science and Technology, Pohang, Korea
- 3PA43 **Investigation of Sterilization Mechanism by Atmospheric Pressure Plasma Jet System (APPJS)**
Y.K. Lee, J.H. Choi, E.S. Lee, S.J. Lee¹, K.M. Song², and H.K. Baik
Yonsei University, Seoul, Korea
¹*Kyungsung University, Busan, Korea*
²*Konkuk University, Chungju, Korea*
- 3PA44 **Plasma-Assisted Catalytic Removal of Nitrogen Oxides**
Y.S. Mok and H.C. Kang
Cheju National University, Jeju, Korea

- 3PA45 **Characteristics of Pulse Corona Discharges for Dissociation of NO_x**
D.C. Seock, Y.S. Choi, Y.H. Jung, and K.S. Chung
Hanyang University, Seoul, Korea
- 3PA46 **Improvement of Ozone Yield by Multi-Discharge Ozonizer Using Superposition of Silent Discharge Plasma**
H.J. Song, B.J. Chun, and K.S. Lee
Yeungnam University, Gyung-san, Korea
- 3PA47 **Ionic Treatment of The Large Area Substrates by Hall Current Accelerator**
G. Abduraimove, E. Khalilov, and I. Ismatov
Samarkand State University, Samarkand, Uzbekistan
- 3PA48 **Secondary Ion Emission from Niobium and Tantalum**
M. Kulieva, E. Khalilov, and G. Abduraimove
Samarkand State University, Samarkand, Uzbekistan
- 3PA49 **Structure and Properties of Nanostructured Al-Si Alloys**
M. Kulieva, I. Ismatov, and G. Abduraimove
Samarkand State University, Samarkand, Uzbekistan
- 3PA50 **Vacuum Arc Deposition of Decorative and Protective Coatings**
N. Sadikov¹ and G. Abdurahimova
Samarkand State University, Samarkand, Uzbekistan
¹*Tashkent Institute of Engineers of Railway Transport, Samarkand, Uzbekistan*
- 3PA51 **Plasma Chemistry of SO_x in a Pulsed Electric Discharge at Atmosphere Pressure**
I.N. Onishchenko, G.P. Berezina, and V.S. Us
Kharkov Institute of Physics & Technology, Kharkov, Ukraine
- 3PA52 **Characteristics of the Steady-State Atmospheric Pressure DC Discharge**
I. Alexeff, S. Parameswaran, and M. Thiyagarajan
University of Tennessee, Knoxville, TN, USA
- 3PA53 **Effects of Exposure to a One Atmosphere Uniform Glow Discharge Plasma (OAUGDPTM) on the Surface Energy and Strength of Nanofiber Fabrics**
W. Chen, X. Li, J.R. Roth, and P.P.Y. Tsai
University of Tennessee, Knoxville, TN, USA
- 3PA54 **PSPICE[®] Simulation of One Atmosphere Uniform Glow Discharge Plasma (OAUGDPTM) Reactor Systems**
Z.Chen, and J.R. Roth
University of Tennessee, Knoxville, TN, USA
- 3PA55 **The Penetration Depth of Plasma Treatment into Porus Media At Atmospheric Pressure**
J. Rahel, W. Chen, and J.R. Roth
University of Tennessee, Knoxville, TN, USA
- 3PA56 **Optimizations of Ozone Generator at Low Resonance Frequency**
A.A. Garamoon, F.F. Elakshar, E.F. Kotp¹, A.H. Saady, and M. Elsayah
Alazhar University, Cairo, Egypt
¹*Alazhar University, Assuit, Egypt*
- 3PA57 **Tribological Behaviour of Plasma Nitrided Ti-5Al-2Nb-1Ta Alloy Against UHMWPE**
S.G. Lakshmi, M.A.K. Babi¹, and D. Arivuoli
Anna University, Chennai, India
¹*DBS Plasma Technology Pvt. Ltd., Pune, India*

3PA58 **Full Bridge Oscillator for Silent Discharge Ozone Generator**
V. Zahedzadeh, M. Akbari, and S. Shirmohammadzadeh
Engineering Research Center, Tabriz, Iran

Tuesday Morning, 3 June 2003
9:30 am – Charlotte Room

Poster Session 3PB01-26: 5.4 Plasmas for Lightning
7.2 Switching
7.4 Compact Pulsed Power Sources
7.5 Pulsed Power Applications

3PB01-3PB07: 5.4 Plasmas for Lightning

- 3PB01 **3D Modeling For HID Lamp Cathodes**
M. Cristea and G. Zissis¹
University of Bucharest, Bucharest, Romania
¹*University of Toulouse 3, Toulouse, France*
- 3PB02 **A Dynamic Conductance Model of Fluorescent Lamp for Electronic Ballast Design Simulation**
K.H. Loo, D.A. Stone¹, R.C. Tozer¹, M. Jinno and R. Devonshire¹
Ehime University, Ehime, Japan
¹*University of Sheffield, Sheffield, UK*
- 3PB03 **XeCl Excimer Emission from a Linear Plasma Array**
R.W. Bentley, J.Kolb, S. Kono, and K.H. Schoenbach
Old Dominion University, Norfolk, USA
- 3PB04 **Cathode Boundary Layer Discharge: Flat Panel DC Excimer Sources**
K.H. Schoenbach, M.M. Moselhy, J. Ansari, J.F. Kolb, and S. Kono
Old Dominion University, Norfolk, USA
- 3PB05 **Charging Processes of Fine Particles by UV Light Irradiation**
A. Ando and T. Yokota
Ehime University, Ehime, Japan
- 3PB06 **Microwave Discharges of Plasma Lighting System**
B.J. Park, J.S. Choi, H.S. Jeon, J.Y. Lee, Y.S. Jeon, and H.J. Kim
LG Electronics, Seoul, Korea
- 3PB07 **Study on Temperature Distribution around Bulb Envelope and Cavity of High Power PLS**
J.Y. Lee, J.S. Choi, H.J. Kim, Y.S. Jeon, and B.J. Park
LG Electronics, Seoul, Korea

3PB08-3PB13: 7.2 Switching

- 3PB08 **Development of A High Coulomb Transfer Triggered Vacuum Switch**
S. S. Park, S. H. Nam, S.H. Kim, Y. K. Kwon, S.H. Kim, Y. J. Han,
Y. J. Park, J.W. Jung¹, J.S. Kim¹, J.H. Chu¹, and G.Y. Sung¹
Pohang University of Science and Technology, Pohang, Korea
¹*Agency for Defense Development, Daejeon, Korea*
- 3PB09 **A Proposal of Lumped Circuit Model for Simulation a Radial Magnetic Field Type Vacuum Switch**
T.H. Lee, C.S. Huh, and H.S. Lee¹
In-ha University, Incheon, Korea
¹*Korea Electrotechnology Research Institute (KERI), Changwon, Korea*
- 3PB10 **A High-Coulomb Transfer Radial Multi-Channel Pseudospark Switch**
H. Heo, S.S. Park, S.H. Nam, Y.J. Han, S.H. Kim, and Y.K. Kwon
Pohang University of Science and Technology, Pohang, Korea

- 3PB11 **Serially Connected IGBT Switches with RC Snubbers**
 J.T. Jin, B.H. Cha, C.J. Kim, and H.H. Lee¹
Korea Atomic Energy Research Institute, Daejeon, Korea
¹*Chungnam National University, Daejeon, Korea*
- 3PB12 **Power Conditioning for Pulsed High Voltage Generation from Capacitor Bank by Using Fuse Opening Switch (FOS) and Tape-Wound Transformer**
 C.H. Kim, J. Lee, and J.W. Ahn
Agency for Defense Development, Daejeon, Korea
- 3PB13 **Design and Testing of a Multi-Triggered Spark Gap Switch for 2-15 kJ Plasma Focus Device**
 H.J. Woo, H.J. You, Y.S. Choi, and K.S. Chung
Hanyang University, Seoul, Korea

3PB14: 7.4 Compact Pulsed Power Sources

- 3PB14 **The Development of RF Generator for Remote Plasma Cleaning Source**
 S.S. Kim and D.K. Choi¹
Seoul National University of Technology, Seoul, Korea
¹*New Power Plasma Co., Seoul, Korea*

3PB15-3PB26: 7.5 Pulsed Power Applications

- 3PB15 **Experimental Study of a Repetitive Marx Generator**
 L. Veron, J.C. Brion¹
Commissariat al'Energie Atomique - PEM, Pontfaverger-Moronvilliers, France
¹*Europulse, Cressensac, France*
- 3PB16 **Enhancement of Energy Deposition in the Pulsed Wire Discharge for the Synthesis of Nanosized Powders**
 C. Cho, K. Murai, T. Suzuki, H. Suematsu, W. Jiang, and K. Yatsui
Nagaoka University of Technology, Nagaoka, Japan
- 3PB17 **Inductive Energy Storage Pulsed Power Modulator Using High Voltage Static Induction Thyristor**
 K. Hashimoto, K. Yamashita, M. Watanabe, A. Okino, E. Hotta, N. Shimizu¹ and K. Iida¹
Tokyo Institute of Technology, Yokohama, Japan
¹*NGK Insulators, Ltd., Japan*
- 3PB18 **Development of a High Frequency and High Voltage Pulse Transformer for Compact TWT HVPS**
 S.C. Kim, D.T. Kim, G.M. Ha, and S.H. Nam
Pohang University of Science and Technology, Pohang, Korea
- 3PB19 **Optimizations of the Processing Parameters for Pulsed Laser Deposition of ZnO Thin Films**
 Z.F. Liu^{1,2}, F.K. Shan¹, Y.X. Li², and Y.S. Yu¹
¹*Donggwi University, Busan, Korea*
²*Shanghai Institute of Ceramics, Shanghai, China*
- 3PB20 **Spectroscopic Ellipsometry Characterization of Al doped ZnO Thin Films Deposited by PLD**
 F.K. Shan, S.Y. Kim¹, and Y.S. Yu
Donggwi University, Busan, Korea
¹*Ajou University, Suwon, Korea*

- 3PB21 **ZnO Thin Films on MgO (100) Substrates Deposited with Plasma Produced by Excimer Laser**
F.K. Shan, Z.F. Liu, G.X. Liu and Y.S. Yu
Donggeui University, Busan, Korea
- 3PB22 **Surface Morphology of Mg-Doped ZnO Thin Films Deposited on Various Conditions by Pulsed Saser Deposition**
J.Y. Sohn^{1,2}, B.I. Kim¹, S.D. Lee², and Y.S. Yu¹
¹*Donggeui University, Busan, Korea*
²*Kyungnam University, Masan, Korea*
- 3PB23 **Structural and Optical Properties of Undoped and Cu-doped ZnO Thin Films Prepared by the Pulsed Laser Deposition at Different Oxygen Pressure**
J.Y. Sohn^{1,2}, B.I. Kim¹, S.D. Lee², and Y.S. Yu¹
¹*Donggeui University, Busan, Korea*
²*Kyungnam University, Masan, Korea*
- 3PB24 **Bremsstrahlung Reflex Triode Modeling and Optimization**
S. Chantrenne, V.L. Bailey, J.R. Goyer, S.D. Putnam, J.C. Riordan,
P. G. Steen, and A. Wilson¹
Titan Pulse Sciences Division, San Leandro, USA
¹*Avonia, San Diego, USA*
- 3PB25 **Recent Pulsed Power Activities at Institute for Plasma Research, India**
D. Lathi, A. Shyam, S. Chaturvedi, and Pulsed Power Group
Institute for Plasma Research, Gandhinagar, India
- 3PB26 **Pulsed and Self Electrical Breakdown in Biodegradable Oil**
M.D. Cevallos, J.C. Dickens, A.A. Neuber, M.A. Haustein, and H.G. Krompholz
Texas Tech University, Lubbock, TX, USA

Tuesday Afternoon, 3 June 2003
1:00 – 6:00 pm

Conference Excursion

A half-day tour of Jeju Island

Tuesday Afternoon, 3 June 2003
6:30 pm

Conference Banquet

Crystal Ballroom

Wednesday Morning, 4 June 2003
8:15 am – Crystal Ballroom

Plenary Session:

Role of Plasma Science in the Studies of Planetary Fluids

Dr. Gilbert W. Collins
Lawrence Livermore National Laboratory

Chair: Dr. Thomas W. Hussey, *Air Force Research Laboratory*

Wednesday Morning, 4 June 2003
9:30 am – Crystal Room I

Oral Session 5A: 1.3 Partially Ionized Gases (II)

Chair: T. Oda, *Tokyo University*

- 5A01-02 **Invited – Effect of Electrode Shape in Dielectric Barrier Discharge Plasma Reactor for NO_x Removals**
K. Takaki, M. Shimizu, T. Sasaki, S. Kato, S. Mukaigawa, and T. Fujiwara
Iwata University, Morioka, Japan
- 5A03 **Study on The Optimum Operating Condition of the Dielectric Barrier Discharge (DBD) for Removing Photoresist**
Y.H. Kim, B.C. Jang, and G.H. Kim¹
Hanyang University, Ansan, Korea
¹*Seoul National University, Seoul, Korea*
- 5A04 **Capacity-Coupled Multi-Discharge at Atmospheric Pressure**
H. Mase, T. Fujiwara¹, and N. Sato²
Ibaraki University, Hitachi, Japan
¹*Iwate University, Morioka, Japan*
²*Tohoku University, Sendai, Japan*
- 5A05 **High Concentration Ozone by Means of Coplanar Discharge**
Y. Okita, K. Nouda, T. Iijima, I. Yamanashi, and T. Murata
Toshiba Corporation, Tokyo, Japan
- 5A06 **Frequency Range for Stable Generation of Atmospheric Glow Discharges in Helium and Nitrogen**
X.T. Deng, and M.G. Kong
Loughborough University, Loughborough, UK
- 5A07 **Aerodynamic Flow Control by Peristaltic Acceleration of a One Atmosphere Uniform Glow Discharge Plasma**
R.C.M. Madhan, M. Yadav, J.R. Roth, and S.P. Wilkinson¹
University of Tennessee, Knoxville, TN, USA
¹*NASA Langley Research Center, Hampton, VA, USA*
- 5A08 **Development of an Analytical Model for Nonthermal Atmospheric Barrier Discharges**
J.J. Shi, X.T. Deng, and M.G. Kong,
Loughborough University, Loughborough, UK
- 5A09-10 **Invited – Current Pulse Effect on 2-T Inductively Coupled Plasma**
K.C. Paul
Ushio Inc., Gotenba, Japan

Wednesday Morning, 4 June 2003
9:30 am – Crystal Room II

Oral Session 5B: 6.1 Tokamak, Stellerator, Spherical Torus (I)

Chair: H. Park, *Princeton Plasma Physics Laboratory*

- 5B01-02 **Invited – Recent Results and Modification Program of JT-60 towards High Integrated Performance**
M. Matsukawa and JT-60 Team
Japan Atomic Energy Research Institute, Naka, Japan
- 5B03-04 **Invited – The National Spherical Torus Experiment (NSTX) Research Program and Building the Scientific Basis for High Beta, Long Pulse Operating Scenarios**
Y.-K.M. Peng and the NSTX Research Team
Princeton Plasma Physics Laboratory, Princeton, NJ, USA
- 5B05-06 **Invited – Present Status of the KSTAR Tokamak Construction**
J.S. Bak
Korea Basic Science Institute, Daejeon, Korea
- 5B07 **Present of the KSTAR Superconducting Magnet System Development**
K. Kim, H.K. Park, K.R. Park, B.S. Lim, S.I. Lee, M.K. Kim, Y. Chu
W.H. Chung, S.H. Baek, J.Y. Choi, H. Yonekawa, A. Chertovskikh, Y.B. Chang
J.S. Kim, C.S. Kim, D.J. Kim, N.H. Song, K.P. Kim, Y.J. Song, I.S. Woo, W.S. Han
D.K. Lee, D.W. Song, J.S. Park, G.S. Lee, H.J. Lee¹, T.K. Ko², and S.J. Lee²
Korea Basic Science Institute, Daejeon, Korea
¹*Korea Atomic Energy Research Institute, Daejeon, Korea*
²*Yonsei University, Seoul, Korea*
- 5B08 **A Power-Producing Fusion Reactor Using Presently Available Components**
I. Alexeff
University of Tennessee, Knoxville, TN, USA
- 5B09 **Penetration of Electrons into Helical Magnetic Field Configuration**
H. Himura, H. Wakabayashi, T. Kurihara, M. Fukao, Z. Yoshida
M. Isobe¹, S. Okamura¹, K. Matsuoka¹, and H. Yamada¹
University of Tokyo, Tokyo, Japan
¹*National Institute for Fusion Science, Toki, Japan*
- 5B10 **Characteristics of Pellet Ablation in High Temperature Plasmas**
K.N. Sato and H. Sakakita¹
Kyushu University, Kasuga, Japan
¹*Nat. Inst. of Adv. Indust. Sci. and Tech. Tsukuba, Japan*

Wednesday Morning, June 4 2003
9:30 am – Crystal Room III

Oral Session 5C: 2.4 Slow Wave Devices

Chair: M. Blank, *Communications and Power Industries, Inc.*

- 5C01-02 **Invited – Experimental Investigation on Millimeter-Wave Folded-waveguide TWT Using Linear Electron Beam**
S.T. Han, J.I. Kim, K.H. Jang, J.K. So, and G.S. Park
Seoul National University, Seoul, Korea
- 5C03 **New Coupled-Domain Technique for Fast 3-D Simulation of Long Slow-wave Structures**
S.J. Cooke, B. Levush¹, A.N. Vlasov², and T.M. Antonsen²
Science Applications International Corporation, McLean, VA, USA
¹*Naval Research Laboratory, Washington, DC, USA*
²*University of Maryland, College Park, USA*
- 5C04 **Experimental Observation and Characterization of Chaos in a driven TWT Oscillator with Delayed Feedback**
S. Bhattacharjee, C. Marchewka, J.H. Booske, and J.E. Scharer
University of Wisconsin, Madison, WI, USA
- 5C05 **Study of Nonlinear Behavior in TWTs**
C.M. Armstrong and T.A. Hargreaves
L-3 Communications, Inc., San Carlos, CA, USA
- 5C06 **Multiple Beam Klystron Development for TESLA**
A. Balkcum, E. Wright, H. Bohlen, L. Cox, M. Cattelino, M. Cusick, F. Friedlander, B. Stockwell, and L. Zitelli
Communications and Power Industries, Palo Alto, CA, USA
- 5C07 **TESLA: Effective Simulation Code for Vacuum Electronic Devices with External Cavities**
A.N. Vlasov, T.M. Antonsen, Jr.¹, D.P. Chernin, K.T. Nguen², S.J. Cooke, and B. Levush²
Science Applications International Corporation, McLean, VA, USA
¹*University of Maryland, College Park, MD, USA*
²*Naval Research Laboratory, Washington, DC, USA*
- 5C08 **Modeling of Beam Transport in Transverse Magnetic Fields**
Y. Shin, G. Scheitrum¹, and D. Sprehn¹
Seoul National University, Seoul, Korea
¹*Stanford Linear Accelerator Center, Menlo Park, CA, USA*
- 5C09 **Investigation of 10-Vane Strapped Magnetron Using Three-Dimensional Particle-In-Cell Simulation**
J.I. Kim, G.S. Park, H.J. Ha¹, and J.C. Shon¹
Seoul National University, Seoul, Korea
¹*Samsung Electronics, Suwon, Korea*
- 5C10 **A Conductor-Centered Arbitrarily-Shaped Helical-Groove Slow-Wave Structure for TWTs**
Y. Wei, G. Yu, W. Wang, Y. Gong, S. Liu, and G.S. Park¹
UESTC, Chengdu, China
¹*Seoul National University, Seoul, Korea*

Wednesday Morning, June 4 2003
9:30 am – Pearl Room

Oral Session 5D: 6.2 Alternative Concepts (Pinches, Linear Machines, etc.)

Chair: M. Kwon, *Korea Basic Science Institute*

- 5D01-02 **Invited – Confinement Improvement and Current Profile Control In the MST Reversed-Field Pinch**
W.X. Ding, and MST Team¹
University of California, Los Angeles, CA, USA
¹*University of Wisconsin, Madison, WI, USA*
- 5D03-04 **Invited – Production of High Density Plasmas with High Harmonic Fast Waves in the GAMMA 10 Tandem Mirror**
M. Ichimura, T. Cho, H. Higaki, M. Hirata, H. Hojo, K. Horinouchi, K. Ishii
M.K. Islam, A. Itakura, S. Kakimoto, I. Katanuma, J. Kohagura, Y. Nakashima,
T. Saito, Y. Yatamatsu, Y. Tamaguchi, K. Yatsu, and M. Yoshikawa
University of Tsukuba, Tsukuba, Japan
- 5D05-06 **Invited – Overview of High Density FRC Research on FRX-L at Los Alamos National Laboratory**
J. Park, T.P. Intrator, G.A. Wurden, J. Degnan¹, C. Grabowski¹, E. Ruden¹, S. Hsu,
J.M. Taccetti and S.Y. Zhang
Los Alamos National Laboratory, Los Alamos, NM, USA
¹*Air Force Research Laboratory, Albuquerque, NM, USA*
- 5D07-08 **Invited – Improved Spheromak Operation with Reduced Fluctuations in SSPX**
D.N. Hill, C. Holcomb, E.B. Hooper, H. McLean, C. Romero-Talamas,
B.W. Stallard, R.D. Wood, and S. Woodruff
Lawrence Livermore National Laboratory, Livermore, CA, USA
- 5D09 **Ohmic Heating, Line Tying, and Preionization in Hanbit**
J.S. Hong, A.C. England, M. Kwon, J.H. Choi, and the Hanbit Team
Korea Basic Science Institute, Daejeon, Korea
- 5D10 **Second Harmonic Ion Cyclotron Heating in a Divertor-Stabilized Tandem Mirror**
Y. Yasaka and A. Maruyama¹
Maizuru National College of Technology, Maizuru, Japan
¹*Kyoto University, Kyoto, Japan*

Wednesday Morning, June 4 2003
9:30 am – Ruby Room

Oral Session 5E: 3.1 Plasma, Ion and Electron Sources

Chair: Y.-S. Hwang, *Seoul National University*

- 5E01-02 **Invited – Development and Applications of RF Driven Ion Sources**
K.N. Leung^{1,2}
¹*Lawrence Berkeley National Laboratory, Berkeley, CA, USA*
²*University of California, Berkeley, CA, USA*
- 5E03 **ECR Ion Sources and Microwave Discharge Ion Sources at LNS: Present Status and Perspectives**
G. Ciavola, S. Gammino, L. Celona, L. Torrisi, L. Andó, M. Presti, and S. Manciangli
INFN-Laboratori Nazionali del Sud, Catania, Italy
- 5E04 **Laser Ion Source and RFQ Linac for Direct Injection Scheme**
H. Kashiwagi, M. Okamura¹, T. Hattori, T. Katayama¹, R.A. Jameson¹,
R. Becker², A. Schempp², T. Takeuchi³, A. Sakumi¹, N. Hayashizaki, Y. Takahashi,
T. Hata, and K. Yamamoto
Tokyo Institute of Technology, Tokyo, Japan
¹*RIKEN, Wakou, Japan*
²*Wolfgang Goethe-Universität, Frankfurt, Germany*
³*National Institute of Radiological Sciences, Chiba, Japan*
- 5E05 **Dense Nonequilibrium Plasma Produced by Powerful Millimeter Wave Radiation**
S. Golubev, D. Mansfeld, S. Razin, A. Sidorov, V. Skalyga, A. Vodopyanov,
V. Zorin, R. Geller¹, T. Lamy¹, P. Sortais¹, and T. Thuillier¹
Institute of Applied Physics, RAS, Nizhny Novgorod, Russia
¹*Institut des Sciences Nucleaires, Martyrs Grenoble, France*
- 5E06 **Low-Pressure Micro Plasma Generation by Harmonic Electron Cyclotron Resonance**
H. Fujiyama and M. Matsushita
Nagasaki University, Nagasaki, Japan
- 5E07 **Effect of Self-Bias on Transport of Vacuum Arc plasmas through Magnetic Filters**
E. Byon, A. Anders¹, and S.C. Kwon
Korea Institute of Machinery & Materials, Changwon, Korea
¹*Lawrence Berkeley National Laboratory, Berkeley, CA, USA*
- 5E08 **Characterization of High-Energy Electrons Produced from the Self-Modulated Laser Wakefield Acceleration**
H. Suk, N. Hafz, C.B. Kim, G.H. Kim, and J.U. Kim
Korea Electrotechnology Research Institute, Changwon, Korea
- 5E09 **Determination of the Equilibrium Steady Ion Sheath in Drifting Plasma**
D.T.K. Kwok, T.W.H. Oates, D.R. McKenzie, and M.M.M. Bilek
University of Sydney, Sydney, Australia

Wednesday Morning, 4 June 2003
9:30 am – Emerald Room

Poster Session 5PA01-47: 1.1 Basic Phenomena
5.2 Thermal Plasma Chemistry and Processing

5PA01-5PA35: 1.1 Basic Phenomena

- 5PA01 **A Theoretical Model, Generation, and Diagnostics of a Large-Volume Plasma**
Y.C. Hong, S.C. Lee, and H.S. Uhm
Ajou University, Suwon, Korea
- 5PA02 **Radial Profiles of Oxygen Atoms in an Inductively Coupled Oxygen RF Discharges**
H. J. Yoon, M. J. Lee¹, C. J. Chung¹, and T.H. Chung¹
Korea Maritime University, Busan, Korea
¹*Dong-A University, Busan, Korea*
- 5PA03 **Properties of Linear Ion Acoustic Waves in Negative Ion Plasmas**
R. Ichiki, S. Yoshimura¹, T. Watanabe¹, Y. Nakamura², and Y. Kawai
Kyushu University, Fukuoka, Japan
¹*National Institute for Fusion Science, Toki, Japan*
²*Institute of Space and Astronautical Science, Kanagawa, Japan*
- 5PA04 **Time Transient Sheaths in Collisionless and Collisional Plasmas**
J.H. Woo and G.H. Kim¹
Hanyang University, Ansan, Korea
¹*Seoul National University, Seoul, Korea*
- 5PA05 **Observation of Anti-E x B Tripole Vortex in a Plasma**
M.Y. Tanaka, A. Okamoto, K. Nagaoka, S. Yosimura, J. Vranjes¹, and M. Kono²
National Institute for Fusion Science, Toki, Japan
¹*Institute of Physics, Belgrade, Yugoslavia*
²*Chuo University, Tokyo, Japan*
- 5PA06 **The Sheath Structure under the Localized Secondary Electron Emission**
H. Matsuura, S. Iguchi, and S. Nakata
Osaka prefecture University, Osaka, Japan
- 5PA07 **Experimental Investigation of Dual Plasma Layer Formation around the Anode in Magnetized Radio Frequency Inductively Coupled Hydrogen Plasma**
D.L. Tang and P.K. Chu
City University of Hong Kong, Hong Kong, China
- 5PA08 **Optical Observation of Localized Plasma after Pulsed Discharges in Liquid Helium**
C. Kojima, K. Minami, S. Komatsu, M. Shindo¹, and O. Ishihara¹
Niigata University, Niigata, Japan
¹*Yokohama National University, Yokohama, Japan*
- 5PA09 **Simulation of Dynamics and Interactions of Charged Particles with Two Electrostatics Waves**
S.V. Vladimirov, S. A. Maiorov¹, and O. Ishihara²
University of Sydney, Sydney, Australia
¹*Institute of General Physics, RAS, Moscow, Russia*
²*Yokohama National University, Yokohama, Japan*
- 5PA10 **Presheath Instability in Two Ion Species Multi-dipole Weakly Collisional Plasma**
A.M. Hala, and N. Hershkowitz¹
KACST, Riyadh, Saudi Arabia
¹*University of Wisconsin, Madison, WI, USA*

- 5PA11 **The study of Presheath Instabilities in Two Ion Species Plasmas**
X. Wang, E. Ko, and N. Hershkowitz
University of Wisconsin, Madison, WI, USA
- 5PA12 **Investigation of a Fully Developed DC Hollow Cathode Discharge**
O.H. Chin and C.S. Wong
University of Malaya, Kuala Lumpur, Malaysia
- 5PA13 **Langmuir Probe Diagnostics of Electronegative Discharge**
T.H. Chung, D.C. Seo¹, H.K. Na¹, and M. Kwon¹
Dong-A university, Busan, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*
- 5PA14 **Comparison of Electron Density Measurements by Using a Plasma Absorption Probe and a Double Langmuir Probe in Inductively Coupled Plasmas**
J.H. Kim, S.C. Choi, Y.H. Shin, and K.H. Chung
Korea Research Institute of Standard and Science, Daejeon, Korea
- 5PA15 **Laser Diagnostics of the Sheath Region in an Argon DC Discharge**
Y.W. Choi and H.J. Lee
Korea Electrotechnology Research Institute, Changwon, Korea
- 5PA16 **Calculation Of Collisionless Space-Charge Sheaths: Method Of Matched Asymptotic Expansions Vs. Patching**
M.S. Benilov
Universidade da Madeira, Funchal, Portugal
- 5PA17 **Description of an Experimental Tripolar Vortex**
J. Vranjes^{1,2}, A. Okamoto¹, S. Yoshimura¹, S. Poedts², M. Kono³
and M.Y. Tanaka¹
¹*National Institute for Fusion Science, Toki, Japan*
²*Centre for Plasma Astrophysics, Leuven, Belgium*
³*Chuo University, Tokyo, Japan*
- 5PA18 **MHD Modes Influenced by Axial Plasma Current**
A. Tsushima, T. Hishida¹, and Y. Amagishi¹
Yokohama National University, Yokohama, Japan
¹*Shizuoka University, Sizuoka, Japan*
- 5PA19 **Spectroscopic Investigation of Micro-Hollow Cathode Discharge**
T. Yamazaki and H. Sasaki¹
Kure National College of Technology, Hiroshima, Japan
¹*Hiroshima University, Hiroshima, Japan*
- 5PA20 **On Electron Heating Mechanism in Low Pressure High Density Inductively Coupled Plasma (ICP)**
C.W. Chung and K.I. You¹
Hanyang University, Seoul, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*
- 5PA21 **Effects of the Collimator on the Plasma Parameters in a Hyper-Thermal Neutral Beam Source**
M. Joung, T. Lho¹, S.J. Yoo¹, D.C. Kim¹, J.S. Kim¹, B.J. Lee¹, M.H. Cho,
and G. H. Kim²
Pohang University of Science & Technology, Pohang, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*
²*Seoul National University, Seoul, Korea*

- 5PA22 **Optical Current Sensor Using Magneto-Optic Effects**
 J.I. Jeon¹, C.W. Jung, W.Z. Park, K.S. Lee, and J.B. Kim²
Kumi Polytechnic College, Kumi, Korea
¹*YeungNam University, Kyong-San, Korea*
²*Hyosung Corporation, Korea*
- 5PA23 **Evaluation of Electrical Conductivity of Non-Ideal Plasma**
 D.-K. Kim, I. Kim, and K.S. Jhung
Agency for Depence Development, Daejeon, Korea
- 5PA24 **Generation of Large-Scale Flows due to the Small-Scale Drift-Wave Turbulence**
 Y.D. Ko and C.B. Kim
Soongsil University, Seoul, Korea
- 5PA25 **Nonlinear Equivalent Circuit Modeling for E to H Mode Transition in an Inductive Plasma Source**
 T. Lho and G. H. Kim¹
Korea Basic Science Institute, Daejeon, Korea
¹*Seoul National University, Seoul, Korea*
- 5PA26 **Power Dissipation Mode Transition Induced by a Driving Frequency Increase in Capacitively Coupled Plasma**
 S.J. You, H.C. Kim¹, H.Y. Chang and J.K. Lee¹
Korea Advanced Institute of Science and Technology, Daejeon, Korea
¹*Pohang University of Science and Technology, Pohang, Korea*
- 5PA27 **Investigation of Afterglow Produced by a Pulsed Inductively Coupled Plasma Source**
 W. Guo and C.A. DeJoseph, Jr.¹
Innovative Scientific Solutions, Inc., Dayton, OH, USA
¹*Air Force Research Laboratory, Wright-Patterson AFB, OH, USA*
- 5PA28 **A Clumpy Fluid Model of Plasma Dynamics**
 R. Cottam
NASA, Glenn, OH, USA
- 5PA29 **Density Transition Characteristics in Magnetized Plasma by Voltage Biasing**
 S. Shinohara, K. Sugimori, and Y. Nakamura
Kyushu University, Fukuoka, Japan
- 5PA30 **Critical Exponents for a Model Vlasov-Poisson System at Marginal Stability**
 S.V. Vladimirov, A.V. Ivanov, and P.A. Robinson
University of Sydney, Sydney, Australia
- 5PA31 **Simultaneous Amplification of Two Waves due to the Cyclotron Interaction with Ensemble of Nonresonant Electrons**
 M.A. Erukhimova and M.D. Tokman
Institute of Applied Physics, RAS, Nizhny Novgorod, Russia
- 5PA32 **Investigation of the Solutions of the Modified Zakharov-Kuznetsov Equation**
 S. Sobhanian, M. Soorani, and S. Khorram
Tabriz University, Tabriz, Iran
- 5PA33 **Role of a Process of Forming Shock Waves During Spark Channel Ionization**
 A.N. Dovbnya¹, K.V. Korytchenko, L.I. Kosoj¹, S.M. Shkirida¹,
 M.A. Krasnogolovets¹, and Yu. Ya Volkolupov¹
Kharkiv Tank Institute of National Technical University, Kharkiv, Ukraine
¹*National Science Center, Kharkiv, Ukraine*

- 5PA34 **Negative Corona Discharge in Argon's Flow**
G.N.B. Dandaron, A.P. Rinchinov, B.Ts. Bazarsadaev, Ts.V. Ranjurov¹
and B.B. Baldanov¹
East-Siberian State Technological University, Ulan-Ude, Russia
¹*Siberian Division of RAS, Ulan-Ude, Russia*
- 5PA35 **About a Plasma Model of Positron Spur In a Substance**
A.A. Paiziev
Institute of Electronics Uzbek Academy of Sciences, Tashkent, Uzbekistan
- 5PA36-5PA47: 5.2 Thermal Plasma Chemistry & Processing**
- 5PA36 **Power Transportation of High Intensity Torch Plasma Arc in a function of High-Speed Cross-Wind**
T. Inaba¹, T. Beppu¹, S.I. Tanaka¹, and T. Iwao²
¹*Chuo University, Tokyo, Japan*
²*University of Minnesota, Minnesota, MN, USA*
- 5PA37 **Temperature and Radiant Power emitted from DC Horizontal Short Free Arc Discharge Mixed with Tungsten Vapor**
T. Iwao^{1,2}, Y. Inoue¹, and T. Inaba¹
¹*Chuo University, Tokyo, Japan*
²*University of Minnesota, Minnesota, MN, USA*
- 5PA38 **Anode Attachment Stability for High Intensity Arcs With Helium, Nitrogen and Argon Gas Flow Parallel to the Anode**
T. Iwao^{1,2}, P. Cronin¹, D. Bendix³ and J. Heberlein¹
¹*University of Minnesota, Minnesota, MN, USA*
²*Chuo University, Tokyo, Japan*
³*Technical University, Leuna, Merseburg, Germany*
- 5PA39 **Measurement of Plasma Density and Electron Temperature Based on the Bi-Maxwellian EEDF and Non-LTE Model in a Low Pressure Spraying Plasma**
Y.H. Jung and K.S. Chung
Hanyang University, Seoul, Korea
- 5PA40 **Estimation of the Effects of Operating Pressure on the Degree of Non-equilibrium in DC-RF Hybrid Plasma Jets Using the Boltzmann Plot Method**
J.S. Nam, J.H. Seo, T.H. Hwang, S.I. Choi, and S.H. Hong
Seoul National University, Seoul, Korea
- 5PA41 **Novel Approach to Abel Inversion in Spectrum Diagnosis of Arc Plasma**
D. Zhu, H. Shao, and Y. Wu
Jiaotong University, Shanghai, China
- 5PA42 **Numerical Modeling of Non-Equilibrium Oxygen Induction Plasmas under Atmospheric Pressure**
T. Watanabe and N. Sugimoto
Tokyo Institute of Technology, Tokyo, Japan
- 5PA43 **Deposition of Ti-DLC Films by Arc-Glow Hybrid Plasma CVD**
N. Ohtake, N. Taniguchi, H. Momose, Y. Aoki, and T. Yasuhara
Tokyo Institute of Technology, Tokyo, Japan
- 5PA44 **Elimination of Micro-Cracks in Fabricating SOFC Component Films by Plasma Spray**
H. Zhang, W. Wang, and G. Wang
Huazhong University of Science and Technology, Hubei, China

- 5PA45 **Generation of Microplasma Jet in Discharge with Pointed Anode**
A.V. Lebedeva, V.A. Gostev, and V.A. Sysun
Petrozavodsk State University, Karelia, Russia
- 5PA46 **Effects of Metal Atomization, Arc and Pressure Fluctuations on the Final Particle Size Distribution in the Wire Arc Spraying Process**
N. Hussary and J. Heberlein
University of Minnesota, Minneapolis, MN, USA
- 5PA47 **Arc Discharge in the Vapor of Electrode Material: Study of the Cathode Processes**
E. Ismailov and Komil Turaev
Samarkand State University, Samarkand, Uzbekistan

Wednesday Morning, 4 June 2003
9:30 am – Charlotte Room

Poster Session 5PB01-22: 4.1 Laser Produced Plasmas
4.2 Fast Z-Pinches and Radiation Sources

5PB01-5PB13: 4.1 Laser Produced Plasmas

- 5PB01 **Radiation from Magnetized Wakes in Ultra-Short High Intensity Laser Pulse and Gas Jet Plasma Interaction**
D. Dorranean, M. Starodubtsev, H. Kawakami, H.P. Araghy, H. Ito, N. Yugami, and Y. Nishida
Utsunomiya University, Utsunomiya, Japan
- 5PB02 **Self-Injected Electron in Self-Modulated Laser Wakefield Accelerator**
C. Kim^{1,2}, J. Kim¹, G.H. Kim¹, J.U. Kim¹, I.S. Ko²,
H.J. Lee¹, and H. Suk¹
¹*Korea Electrotechnology Research Institute (KERI), Changwon, Korea*
²*Pohang University of Science and Technology, Pohang, Korea*
- 5PB03 **Generation of Gas Density Transition for Laser Wake Field Acceleration**
G.H. Kim, C. Kim, N. Hafz, J.U. Kim, H.J. Lee and H. Suk
Korea Electrotechnology Research Institute, Changwon, Korea
- 5PB04 **High Energy Electrons and Ions Generation by an Ultra-intense Laser Plasma Interactions**
T. Okada, T. Kitada and A.A. Andreev¹
Tokyo University of Agriculture and Technology, Tokyo, Japan
¹*Institute for Laser Physics, St. Petersburg, Russia*
- 5PB05 **Plasma Channel Formation in Laser Produced Plasma by Using Two Subsequent Laser Pulses**
J.U. Kim, C. Kim, G.H. Kim, N. Hafz, H.J. Lee, and H. Suk
Korea Electrotechnology Research Institute, Changwon, Korea
- 5PB06 **Solitary Waves in a Plasma Interacting with Two Counter-Propagating Laser Pulses**
H.J. Lee, J. Kim, C. Kim, G.H. Kim, J.U. Kim, and H. Suk
Korea Electrotechnology Research Institute, Changwon, Korea
- 5PB07 **Ionization-Induced Generation of Strong Langmuir Waves by High-Intensity Bessel Beam**
V.B. Gildenburg and N.V. Vvedenskii
Institute of Applied Physics, RAS, Nizhny Novgorod, Russia
- 5PB08 **Recombination Process of Produced ZnO Plasma in a Gas Atmosphere**
S. Namba, R. Nodu, and K. Takiyama
Hiroshima University, Higashi-Hiroshima, Japan
- 5PB09 **Dynamics of Laser-Ablation Plume and Ambient Gas Visualized by Two-Dimensional Laser-Induced Fluorescence**
H. Watarai and K. Sasaki
Nagoya University, Nagoya, Japan
- 5PB10 **Radiative Recombination Processes in Classical Nonideal Plasmas**
M.Y. Song and Y.D. Jung
Hanyang University, Ansan, Korea
- 5PB11 **Resonant Change-Exchange Processes in Classical Nonideal Plasmas**
M.Y. Song and Y.D. Jung
Hanyang University, Ansan, Korea

- 5PB12 **Preparation of Crystalline Carbon Nitride Bulk Samples**
 J.I. Kim, K.P. Burdina¹, N.B. Zorov¹, and Y.Y. Kuzyakov¹
Korea University of Technology and Education, Cheonan, Korea
¹*Moscow State University, Moscow, Russia*
- 5PB13 **Equation of State Experiments Using Laser-Driven Shocks at Shengguang Facility**
 H. Xiuguang, F. Sizu, W. Jiang, W. Riurong, M. Mingxun, H. Juhua Y. Junjiang, and G. Yuan
Shanghai Institute of Laser Plasma, Shanghai, China
- 5PB14-5PB22: 4.2 Fast Z-Pinches and Radiation Sources**
- 5PB14 **Optimal Design of Wire Array Loads for Fast Z-pinch Implosions**
 N. Ding
Institute of Applied Physics and Computational Mathematics, Beijing, China
- 5PB15 **X pinch Source Characteristics for X-rays above 10 keV**
 T.A. Shelkovenko^{1,2}, S.A. Pikuz^{1,2}, K.M. Chandler¹, D.A. Hammer¹, M.D. Mitchell¹
 and B.M. Song¹
¹*Cornell University, Ithaca, NY, USA*
²*P.N. Lebedev Physical Institute, Moscow, Russia*
- 5PB16 **Pinching Discharge in Nitrogen Filled Capillary for Soft X-ray Laser Recombination Pumping**
 P. Vrba¹, M. Vrbova, N.A. Bobrova², and P.V. Sasorov²
Czech Technical University in Prague, Czech Republic
¹*Institute of Plasma Physics ASCR, Prague, Czech Republic*
²*Institute of Theoretical and Experimental Physics, Moscow, Russia*
- 5PB17 **Xe-filled Capillary Z-pinch Discharge Light Source for Extreme-Ultraviolet (EUV) Lithography**
 I.H. Song, T. Kasao, M. Okamoto, M. Watanabe, A. Okino, K. Horioka, and E. Hotta
Tokyo Institute of Technology, Yokohama, Japan
- 5PB18 **Tapered-Capillary Pinch Plasma as a Candidate for Bright EUV Source**
 F. Maejima, C. Iida, M. Nakajima, and K. Horioka
Tokyo Institute of Technology, Yokohama, Japan
- 5PB19 **Optimization of Plasma Focusing Device By Electrode Geometry and Dielectric Insulator**
 H.J. Woo, H.J. You, Y.S. Choi, K.S. Chung, C.Y. Han, and J.K. Kim
Hanyang University, Seoul, Korea
- 5PB20 **Effect of Pressure on the Axial Phase Dynamics of a Small Plasma Focus Device**
 R. Mongkolnavin, D. Ngamrunroj, C.S. Wong¹, S.L. Yap¹, and Y.K. Low¹
Chulalongkorn University, Bangkok, Thailand
¹*University of Malaya, Kuala Lumpur, Malaysia*
- 5PB21 **X-ray Spectroscopic Measurements of a Vacuum Spark Triggered by the Transient Hollow Cathode Electron Beam**
 C.S. Wong
University of Malaya, Kuala Lumpur, Malaysia
- 5PB22 **Study on Neutron Radiation of Dense Plasma Focus with Different Electrodes Design**
 L. Chen, S.P. Feng, and S.S. Gao
CAEP, Mianyang, China

Wednesday Afternoon, 4 June 2003
1:30 pm – Crystal Ballroom

Plenary Session:

Fusion Research by Magnetic Confinement Devices in Japan

Dr. Shinzaburo Matsuda
Japan Atomic Energy Research Institute

Progress on the National Ignition Facility (NIF) and ICF Target Physics

Dr. Larry J. Suter
Lawrence Livermore National Laboratory

Chair: Prof. Tatsuhiko Yamahara, *Osaka University*

Wednesday Afternoon, 4 June 2003
3:30 pm – Crystal Room I

Oral Session 6A: 5.6 Medical, Biological and Environmental Applications (I)

Chair: S. Ahn, *Seoul National University*

- 6A01-02 **Invited – Studies on SO₂ Removal Using Strong Micro-Gap Discharge**
M. Bai, X. Bai, H. Tong, and X. Shen
Dalian Maritime University, Dalian, China
- 6A03 **Environmental Applications of the Microwave Plasma Torch**
H.S. Uhm and Y.C. Hong
Ajou University, Suwon, Korea
- 6A04 **Characteristics of Particulate Formation for Removal of SO₂ from Flue Gases by Corona Discharge Radical Shower Non-Thermal Plasma Systems**
R. Yamaguchi^{1,2}, M. Nimura^{1,2}, M. Itoh¹, J.S. Chang², K. Urashima²,
W.M. Wang^{2,3}, H.F. Hu^{2,3}, Y.X. Tong³ and W.P. Liu³
¹*Doshisha University, Kyoto, Japan*
²*McMaster University, Hamilton, Canada*
³*Safety and Environ. Protection Res. Inst., State Environmental Protection General Agency, Wuhan, China*
- 6A05 **Experimental Study for Control of VOCs Using Plasma –Catalyst Hybrid System**
J.O. Chae, G.M. Vasiliev¹, V.I. Demidiouk, N.M. Yeulash, and I.C. Choi
Inha University, Incheon, Korea
¹*National Academy of Sciences of Belarus, Minsk, Republic of Belarus*
- 6A06 **Operating of Industrial Scale Dielectric Barrier Discharge Reactor for NO_x or Odor Control**
Y.H. Song, M.S. Cha, J.O. Lee, Y. Kim, K.T. Kim, W.H. Shin and S.J. Kim
Korea Institute of Machinery & Materials, Daejeon, Korea
- 6A07-08 **Invited – Air Purification Technology by means of Cluster Ions Generated by Discharge Plasma at Atmospheric Pressure**
K. Nishikawa and H. Nojima
Sharp Corporation, Yao, Japan

Wednesday Afternoon, 4 June 2003
3:30 pm – Crystal Room II

Oral Session 6B: 6.1 Tokamak, Stellarator, Spherical Torus (II)
6.5 Heating and Current Drive Systems

Chair: A. England, Korea Basic Science Institute

- 6B01-02 **Invited – Existence and Universality of Intermittent Convective Transport in Magnetically Confined Devices**
University of California, San Diego, CA, USA
- 6B03-04 **Invited – Edge Pedestal and Er-Layer Formation by X-Transport in a Tokamak Plasma**
C.S. Chang and S.H. Ku
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 6B05-06 **Invited – Progress in the 10 MW ECRH System for the Stellarator W7-X**
G. Dammertz¹, V. Erckmann³, G. Gantenbein⁴, W. Kasperek⁴, H.P. Laqua³,
W. Leonhardt¹, G. Mueller⁴, G. Neffe¹, M. Schmid¹, and M. Thumm^{1,2}
¹*Forschungszentrum Karlsruhe, Association Euratom-FZK, Karlsruhe, Germany*
²*Universitaet Karlsruhe, Karlsruhe, Germany*
³*Max-Planck-Institut fuer Plasmaphysik (IPP), Greifswald, Germany*
⁴*Institute fuer Plasmaphysik, Universitat Stuttgart, Stuttgart, Germany*
- 6B07 **Suppression of Externally Induced Magnetic Island by Plasma Current Oscillation in HYBTOK-II**
Y. Kikuchi, H. Takahashi, Y. Uesugi, and S. Takamura
Nagoya University, Nagoya, Japan
- 6B08 **Stability of Kinetic Ballooning Mode at Steep Pressure Gradient**
A. Hirose
University of Saskatchewan, Saskatoon, Canada
- 6B09 **Progress in Development of KSTAR ICRF System**
B.G. Hong, Y.D. Bae, C.K. Hwang, S.U. Jeong, J.G. Kwak, and J.S. Yoon
Korea Atomic Energy Research Institute, Daejeon, Korea
- 6B10 **Performance of the Prototype KSTAR Neutral Beam Injection System**
B.H. Oh, K.W. Lee, S.R. In, S.H. Jeong, K.S. Jung, B.J. Yoon, C.S. Seo,
D.H. Chang, Y.W. Jun, D.S. Park, S.J. Hong, and J.C. Kim
Korea Atomic Energy Research Institute, Daejeon, Korea

Wednesday Afternoon, 4 June 2003
3:30 pm – Crystal Room III

Oral Session 6C: 5.2 Thermal Plasma Chemistry & Processing (I)

Chair: J. Lowke, *Telecommunications and Industrial Physics, CSIRO*

- 6C01-02 **Invited – A Numerical Modeling of Free-burning Argon Arc with Anode Melting**
M. Ushio, M. Tanaka, and J.J. Lowke¹
Osaka University, Osaka, Japan
¹*CSIRO, Lindfield, Australia*
- 6C03 **Simulation of Diffuse and Spot Modes of Current Transfer to Thermionic Cathodes**
M.S. Benilov and M.D. Cunha
Universidade da Madeira, Funchal, Portugal
- 6C04 **Three-Dimensional Modeling of Arc Root Rotation by External Magnetic Field in Non-transferred Thermal Plasma Torches**
J.M. Park, K.S. Kim, T.H. Hwang and S.H. Hong
Seoul National University, Seoul, Korea
- 6C05 **Three-Dimensional Nonequilibrium Numerical Modeling of Arc-Anode Attachment in High-Intensity Argon Arcs**
J. Park, J. Heberlein, E. Pfender, and G. Candler
University of Minnesota, Minneapolis, MN, USA
- 6C06 **Numerical Modeling of Hybrid Stabilized Electric Arc With Uniform Mixing of Gases**
J. Jenista
Institute of Plasma Physics ASCR, Prague, Czech Republic
- 6C07 **Simulation of DC and Surface-Wave Discharges In Atmospheric-Pressure Air and Its Mixtures With Hydrocarbons**
M.S. Benilov¹ and G.V. Naidis^{1,2}
¹*University of Madeira, Funchal, Portugal*
²*Institute of High Temperature, RAS, Moscow, Russia*
- 6C08 **Computational Studies of ICP Thermal Plasma Torch: Effects of the Flow and Wall Cooling on Temperature Distribution**
V. Kudriavtsev, V. Kolobov¹, K.W. Suh², and S. An²
CFD CANADA, Toronto, Canada
¹*CFDRC, Huntsville, AL, USA*
²*Kyungwon Tech., Songnam, Korea*
- 6C09 **Study on Electric Property of Multi-Constrict Arc Plasma**
D. Zhu, H. Shao, and Y. Wu
Shanghai Jiaotong University, Shanghai, China
- 6C10 **Effects of Anode Nozzle Geometry on Ambient Air Entrainment into Thermal Plasma Jets Generated by a Non-Transferred Plasma Torch**
S.S. Choi, T.H. Hwang, D.U. Kim, J.H. Seo, K.S. Kim, and S.H. Hong
Seoul National University, Seoul, Korea

Wednesday Afternoon, 4 June 2003
3:30 pm – Pearl Room

Oral Session 6D: 4.1 Laser Produced Plasmas

Chair: C. Deeney, *Sandia National Laboratory*

- 6D01-02 **Invited – Electronic Property Measurements of Solid Density Plasmas with X-ray Scattering**
S.H. Glenzer
Lawrence Livermore National Laboratory, Livermore, CA, USA
- 6D03 **Femtosecond Hard X-rays via Thomson-Scattering on Electrons Produced by Ultra-Intense Laser Wake Field Acceleration**
A. Zhidkov, T. Hosokai, K. Kinoshita, and M. Uesaka
University of Tokyo, Naka, Japan
- 6D04 **Multi keV X-ray Source from Femtosecond Laser Produced Micro Plasma**
C. Serbanescu, J. Santiago, and R. Fedosejevs
University of Alberta, Edmonton, Canada
- 6D05 **Acceleration of Dense Electron Bunches by Ultra-Intense Laser Pulse**
V.V. Kulagin^{1,2}, V.A. Cherepenin³ and H. Suk¹
¹*Korea Electrotechnology Research Institute, Changwon, Korea*
²*Moscow State University, Moscow, Russia*
³*Institute of Radioengineering and Electronics, RAS, Moscow, Russia*
- 6D06 **Picosecond X-ray Laser Interferometry for Probing Dense Laser-Produced Plasmas**
J. Dunn, R.F. Smith, J. Filevich¹, J.J. Rocca¹, S.J. Moon, J. Nilsen, V.N. Shlyaptsev², J.R. Hunter, and M.C. Marconi^{1,3}
Lawrence Livermore National Laboratory, Livermore, CA, USA
¹*Colorado State University, Fort Collins, CO, USA*
²*University of California, Davis, CA, USA*
³*University of Buenos Aires, Argentina*
- 6D07 **AC Conductivity of Warm Dense Gold**
T. Ao¹, K. Widmann², M.E. Foord², D.F. Price², P.T. Springer², and A. Ng^{1,2}
¹*University of British Columbia, Vancouver, Canada*
²*Lawrence Livermore National Laboratory, Livermore, CA, USA*
- 6D08 **Laser Produced Plasma Light Source for Next Generation Lithography**
T. Sukanuma, T. Abe, H. Hoshino, Y. Imai, H. Komori, H. Someya, G. Soumagne, Y. Sugimoto, H. Mizoguchi, and A. Endo
Hiratsuka Research & Development Center, Hiratsuka, Japan
- 6D09 **Intensity Variation of Extreme Ultra-Violet (EUV) Radiation from High-Density Laser-Produced Xe Plasmas**
S.S. Jung, Y.S. Jin, Y.J. Kim and G.H. Rim
Korea Electrotechnology Research Institute, Changwon, Korea

Wednesday Afternoon, 4 June 2003
3:30 pm – Ruby Room

Oral Session 6E: 3.2 Intense Electron and Ion Beams

Chair: B.-H. Oh, *Korea Atomic Energy Research Institute*

- 6E01-02 **Invited – High-Current Heavy Ion Beams in Electrostatic Plasma Lens**
A.A. Goncharov and I.G. Brown¹
NAS of Ukraine, Kiev, Ukraine
¹*Lawrence Berkeley National Laboratory, Berkeley, CA, USA*
- 6E03-04 **Invited – Plasma Wakefield Acceleration Experiments with 28.5 GeV Electron and Positron Beams**
P. Muggli, B.E. Blue, C.E. Clayton, F.J. Decker¹, S. Deng, E.S. Dodd, P. Emma, M.J. Hogan¹, C. Huang, R. Iverson¹, C. Joshi, T.C. Katsouleas², P. Krejak, S. Lee², K.A. Marsh, W.B. Mori, C.L. O'Connell¹, E. Oz², P. Raimondi¹, R. Siemann¹, D. Walz¹ and S. Wang
University of California, Los Angeles, CA, USA,
¹*Stanford Linear Accelerator Center, Stanford, USA*
²*University of Southern California, Los Angeles, CA, USA*
- 6E05 **Dissipative Instability of Overlimiting Electron Beam**
E.V. Rostomyan
National Academy Science of Armenia, Ashtarak, Armenia
- 6E06 **Effects of the Plasma Conductivity on Transverse Instabilities in High-Intensity Ion Beams**
H.S. Uhm and R.C. Davidson¹
Ajou University, Suwon, Korea
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 6E07 **Construction of a New Beam Line for Charged Particle Spectroscopy at the MC-50 Cyclotron of KCCH and Beam Diagnosis by Using a ΔE -E Counter Telescope**
Y.K. Kwon, C.S. Lee, J.H. Lee, and J.S. Chai¹
Chung-Ang University, Seoul, Korea
¹*Korea Cancer Center Hospital, Seoul, Korea*
- 6E08 **Bulk Explosives Detection Using Nuclear Resonant Absorption Technique**
T.J.T. Kwan, K. J. Bowers, B.G. DeVolder, and R.E. Morgado
Los Alamos National Laboratory, Los Alamos, NM, USA

Wednesday Afternoon, 4 June 2003
3:30 pm – Emerald Room

Poster Session 6PA01-46: 5.1 Low Pressure Plasma Processing (I)

- 6PA01 **Effect of Magnetic Field on High-Voltage Glow Discharge during Plasma Implantation**
X.B. Tian^{1,2}, S.Q. Yang², R.K.Y. Fu¹, and P.K. Chu¹
¹*City University of Hong Kong, Kowloon, Hong Kong*
²*Harbin Institution of Technology, Harbin, China*
- 6PA02 **Characterization and Property of Ti-Ta-O Films Fabricated by Plasma Immersion Ion Implantation and Deposition**
J.Y. Chen, Y.X. Leng, G.J Wan, P. Yang, H. Sun, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 6PA03 **Plasma Implantation of Inner Wall of Cylindrical Insulating Tube**
X. B. Tian^{1,2}, J. C. Tian², S. Q. Yang², R. K. Y. Fu¹, and P.K. Chu¹
¹*City University of Hong Kong, Kowlong, Hong Kong*
²*Harbin Institution of Technology, Harbin, China*
- 6PA04 **Study of Corrosion Resistance of AISI 420 Stainless Steel after High Temperature N and Si Ion Implantation**
D.L. Tang, R.K. Y. Fu, and P.K. Chu
City University of Hong Kong, Kowloon, Hong Kong
- 6PA05 **Ti-N-O Nano-Films Deposited by Plasma Immersion Ion Implantation and Deposition: Deformation Behavior and Mechanical Properties**
G.J Wan, N. Huang, H. Sun, P.Y. Yang, Y.X. Leng, J.Y. Chen, and J. Wang
Southwest Jiaotong University, Chengdu, China
- 6PA06 **Investigation of Characteristics and Mechanical Properties of Nitrogen Incorporated Carbon Films Prepared by PIII-D**
F. Wen, N. Huang, H. Sun, Y.X. Leng, P. Yang, G.J. Wan, and J. Wang
Southwest Jiaotong University, Chengdu, China
- 6PA07 **Effects of Ion Implantation on Three-Dimensional Model Systems by Plasma Based Ion Implantation**
T. Ishii, Y.J. Yang, K. Fujita, and Y. Hibino
Ion Engineering Research Institute Corporation, Hirakata, Japan
- 6PA08 **The Start-Up and Preliminary Operation of the 60 kV Plasma Ion Implantation**
J.H. Kim, S.A. Nikiforov, S.V. Shenderey, G.H. Rim, J. Kim, and Y.Z. You¹
Korea Electrotechnology Research Institute, Changwon, Korea
¹*University of Ulsan, Ulsan, Korea*
- 6PA09 **The Space-Time Evolution of Species Concentrations in the Etching Process Measured by Optical Plasma Emission Spectroscopy**
T.L. Lin, H.C. Ting, and K.C. Leou
National Tsinghua University, Hsinchu, Taiwan
- 6PA10 **The Etching Properties of SBT Thin Films in BC₃/Cl₂/Ar Plasma**
J.W. Kim, D.P. Kim, and C.I. Kim
Chung-Ang University, Seoul, Korea
- 6PA11 **Inductively Coupled Plasma Etching of (Pb,Sr)TiO₃ Thin Film in a Cl₂/Ar Plasma**
G.H. Kim, D.P. Kim, K.T. Kim, and C.I. Kim
Chung-Ang University, Seoul, Korea

- 6PA12 **New Plasma Source Development Using a Parallel Resonance Antenna for Dry Etching**
G.C. Kwon, H.S. Kim, J.S. Kim, S.H. Choi, J.S. Kim, D.S. Lee¹, Y.K. Lee¹
and H.Y. Chang¹
Jusung Engineerign Co., Ltd., Kwangju-Si, Korea
¹*Korea Advanced Institute of Science and Technology, Daejeon, Korea*
- 6PA13 **Comparison of the Electrical Properties for Etched and As-deposited BET Thin Films**
K.T. Lim, K.T. Kim, D.P. Kim, and C.I. Kim
Chung-Ang University, Seoul, Korea
- 6PA14 **Plasma Diagnosis and End-Point Detection with an Optical Emission Spectroscopy During High Density Inductively Coupled BCl₃ Plasma Etching**
G.S. Cho, J.W. Lee, W.T. Lim, I.G. Baek, K.S. Cho¹, and S.J. Pearton²
Inje University, Gimhae, Korea
¹*Clitek, Inc., Bucheon, Korea*
²*University of Florida, Florida, USA*
- 6PA15 **Remote R.F. Plasma Cleaning for the Removal on Organic Impurity**
H. Soh, S.K. Moon, and Y.C. Kim
Hanyang University, Seoul, Korea
- 6PA16 **ECR Plasma Precleaning for ZnO Epitaxy on Sapphire and Silicon Substrates**
J. Lim and C. Lee
Inha University, Incheon, Korea
- 6PA17 **Characteristics of Cu Thin Film on PET by ECR-PECVD**
J. Jhin, H. Koh, J. Lee¹, D. Park¹ and D. Byun
Korea University, Seoul, Korea
¹*Korea Institute of Science and Technology, Seoul, Korea*
- 6PA18 **a-C:F:H Film with Low k and High Thermal Stability Deposited by Electron Cyclotron Resonance Chemical Vapor Deposition at Room Temperature**
Y. Xin, S.H. Cheng, S.H. Xu, C. Ye, Z.H. Ning, X.H. Lu, S.L. Xiang, W. Du, S. Huang, and J. Chen
Suzhou University, Suzhou, China
- 6PA19 **Mechanical Properties and Structural Characteristics of Hydrogen Incorporated Carbon Films Synthesized by PIII-D**
F. Wen, N. Huang, H. Sun, P. Yang, Y.X. Leng, J.Y. Chen, and G.J. Wan
Southwest Jiaotong University, Chengdu, China
- 6PA20 **Photovoltaic Characteristics of a-C:H Films Prepared by Plasma CVD**
Y. Aoki, K. Iwashige, and N. Ohtake
Tokyo Institute of Technology, Tokyo, Japan
- 6PA21 **Production of a-C:F Film in A C₈F₁₈ Vapor RF Plasma and its Chemical and Electrical Properties**
A. Ohta, Y. Sakai, C. Biloiu¹, I.A. Biloiu¹, and Y. Suda
Hokkaido University, Sapporo, Japan
¹*Bucharest Universit, Bucharest-Magurele, Romania*
- 6PA22 **Competitive Protein Adsorption and Platelet Adhesion on Poly (Ethylene Terephthalate) Surface Modified by Plasma Grafting**
J. Wang^{1,2}, Ch. J. Pang², N. Huang², S. Hong², P. Yang², Y.X. Leng², Y.J. Chen², G.J. Wang², and P.K. Chu¹
¹*City University of Hong Kong, Kowloon, Hong Kong*
²*Southwest Jiaotong University, Chengdu, China*

- 6PA23 **Electrical Stability of a-C:F Film with Low-k Dielectric Constant Deposited by ICPCVD Method**
H.J. Ko and C.K. Choi
Cheju National University, Jeju, Korea
- 6PA24 **Electrical Stability of the Organic-Ignorganic Material with Low-k Dielectric Constant Deposited by ICPCVD Method**
K.S. Oh and C.K. Choi
Cheju National University, Jeju, Korea
- 6PA25 **Plasma Polymetization in Pulse-Periodical Discharge**
G.E. Bugrov, S.G. Kondranin, E. A. Kralkina, V.B. Pavlov, and K.V. Vavilin
Plasma Tech. Co.,Ltd, Songnam, Korea.
- 6PA26 **Effects of ECR Plasma Pretreatment for the Nucleation Density and the Crystallographic Orientation of RuO₂ Deposited on the TiN Substrate by MOCVD**
T. Eom, K. Choi, K. Shin, and C. Lee
Inha University, Incheon, Korea
- 6PA27 **Plasma Enhanced Metal Organic Chemical Vapor Deposition (PEMOCVD) of Catalytic Coatings for Fuel Cell Reformers**
R. Dhar, P.D. Pedrow, T.M. Moeller¹, and Q. Ming¹
Washington State University, Pullman, WA, USA
¹*InovaTek, Inc., Richland, WA, USA*
- 6PA28 **Influences of Microwave Plasma Power on the Structure of Amorphous Hydrogenated Carbon Deposited by ECRCVD**
M.G. Ko and J.W. Park
Hanyang University, Seoul, Korea
- 6PA29 **The Formation of Hydrophobic Thin Films on Metal Surfaces**
H. Soh, S.K. Moon, and Y.C. Kim
Hanyang University, Seoul, Korea
- 6PA30 **Optical Spectroscopy of CH₄/H₂ and C₂H₂/H₂ Plasma Generated in an RF Planar Coil Inductively Coupled Plasma System Used for CVD Diamond Deposition**
C.H. Tan, K.H. Ng, R. Md Nor, and C.S. Wong
University of Malaya, Kuala Lumpur, Malaysia
- 6PA31 **The Dispersion Study of TiO₂ Nano-Particles Modified by Surface Tailoring Coating of Pulsed RF Plasma Polymerization**
F. Zhu, Q. Yang, C. Shi, Z. Chen, Y. Guo, H. Ni, R. Zhou, H. Xie, and J. Zhang
Donghua University, Shanghai, China
- 6PA32 **Deposition of Diamond Films from Plasma of a Secondary Discharge Supported by RF Discharge**
I.A. Mozharovskiy, V. Chernyak, M. Fedorchenko, I. Babich, and V. Zrazhevskij
Taras Shevchenko Kyiv University, Kyiv, Ukraine
- 6PA33 **Spatially Resolved Analysis of Carbon-based Plasmas in an ICP System**
C.J. Collard, M.L. Brake, J.P. Holloway, S.P. Song¹, M.A. Crimp¹, and V.M. Ayres¹
University of Michigan, Ann Arbor, MI, USA
¹*Michigan State University, East Lansing, MI, USA*
- 6PA34 **Methane Activation of Plasma and Catalytic Reaction**
W. Cho¹, H. Soh, S.K. Moon, and Y.C. Kim
Hanyang University, Seoul, Korea
¹*Korea Gas Corporation, Incheon, Korea*

- 6PA35 **Spectroscopic Study of Ionization Enhancement in Magnetron Sputtering with Solenoid Coil**
Y.M. Kim, M.J. Jung, and J.G. Han
Sungkyunkwan University, Suwon, Korea
- 6PA36 **Deposition of TiN Thin Films Using Grid-Assisting Magnetron Sputtering**
M.J. Jung, Y.M. Kim, Y.M. Chung, and J.G. Han
Sungkyunkwan University, Suwon, Korea
- 6PA37 **Influence of Deposition Parameter on the Structural and Electrical Properties of ZrO₂ Thin Films**
S.H. Jeong, I.S. Bae, S.B. Lee, and J.H. Boo
Sungkyunkwan University, Suwon, Korea
- 6PA38 **The Effect of NiO Sputtering Condition to the Exchange Anisotropy of NiFe/NiO Bilayer**
D.H. Lee, S.Y. Yoon, J.H. Kim, and S.J. Suh
Sungkyunkwan University, Suwon, Korea
- 6PA39 **Hybrid Formation of TiCN Using Ion Beam Sputtering and Annealing Methods**
P.C. Concepcion and H.J. Ramos¹
Intel Technology Philippines, Cavite, Philippines
¹*University of the Philippines, Queson, Philippines*
- 6PA40 **Sputtering of W-Pd Bimetallic System under Nitrogen Plasma Impact**
G.P. Glazunov, A.A. Andreev, D.I. Baron, E.D. Volkov, A.P. Dolgiy, K.M. Kitaevskiy, A.L. Konotopskiy and A. Hassanein¹
Kharkov Institute of Physics and Technology, Kharkov, Ukraine
¹*Argonne National Laboratory, Argonne, IL, USA*
- 6PA41 **Diffusion of Cathodic Arc Plasma in a Magnetic Filter**
T. Zhang¹, P.K. Chu, and I.G. Brown²
City University of Hong Kong, Kowloon, Hong Kong
¹*Beijing Normal University, Beijing, China*
²*University of California, Berkeley, CA, USA*
- 6PA42 **Evolution of Surface Micro-Features on Titanium Nitride Films Deposited Using Plasma Vacuum Arc Methods**
L.H. Li^{1,2}, P.K. Chu¹, S.C.H. Kwok¹, Y.Q. Wu², and Y.H. Zhang²
¹*City University of Hong Kong, Kowloon, Hong Kong*
²*Beijing University of Aeronautics and Astronautics, Beijing, China*
- 6PA43 **Investigation of the Erosion Characteristics of Cathodes with Poor Conductivity in Cathodic Vacuum Arc Plasma Sources**
R.K.Y. Fu, D.L. Tang, P. Chen, L. R. Shen, X. B. Tian, and P.K. Chu,
City University of Hong Kong, Kowloon, Hong Kong
- 6PA44 **Comparative Properties of Titanium Oxide Biomaterials Grown by Pulsed Vacuum Arc Plasma Deposition and by Unbalanced Magnetron Sputtering (UBM)**
Y. X. Leng, J.Y. Chen, G.J. Wan, H. Sun, P. Yang, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China
- 6PA45 **Enhanced Corrosion Resistance of Ti6Al4V with Ti-O Film Deposited by DC Metal Vacuum Arc Deposition**
G.J. Wan, P. Yang, Y.X. Leng, H. Sun, J.Y. Chen, J. Wang, and N. Huang
Southwest Jiaotong University, Chengdu, China

6PA46 **Measurements of RF Planar Coil Inductively Coupled Plasma Parameters by Using Compensated Electric Probe**

B. Paosawatyanyong, M. Nisoa¹, and K.H. Ng²

Chulaongkorn University, Bangkok, Thailand

¹*Walailak University, Nakhon Si Thammarat, Thailand*

²*University of Malaya, Kuala Lumpur, Malaysia*

Wednesday Afternoon, 4 June 2003
3:30 pm – Charlotte Room

**Poster Session 6PB01-26: 5.1 Low Pressure Plasma Processing(II)
5.3 Plasma Thrusters**

6PB01-6PB20: 5.1 Low Pressure Plasma Processing (II)

- 6PB01 **HDP-CVD STI Gap-Fill Using the Parallel Resonance Antenna**
J.B. Lee, J.H. Han, C.S. Kim, D.B. Kang, G.C. Kwon, and Y. Lee
Jusung Engineering Co., Ltd., Gwangju, Korea
- 6PB02 **Interaction of Processing Ion Beams with Background Plasmas and Neutrals**
H. Boehmer, D. Edrich, W. Heidbrink, R. McWilliams, and L. Zhao
University of California, Irvine, CA, USA
- 6PB03 **Experimental Characterization of a Time-Modulated Inductively-Coupled Discharge**
K.C. Leou, C.H. Cheng, and T.L. Lin
National Tsinghua University, Hsinchu, China
- 6PB04 **Electrical Characteristics of the Dual Frequency Capacitively Coupled Plasma (CCP)**
B.I Jeon, H.Y. Chang, and J. Shon¹
Korea Advanced Institute of Science and Technology, Daejeon, Korea
¹*Lam Research Corporation, Fremont, CA, USA*
- 6PB05 **EEDF Measurements in Dual Frequency Capacitively Coupled Plasma(CCP) and Comparison with PIC Simulation**
B.I Jeon, H.Y. Chang, and J. Shon¹
Korea Advanced Institute of Science and Technology, Daejeon, Korea
¹*Lam Research Corporation, Fremont, CA, USA*
- 6PB06 **Mechanical Properties of Ti-Me-N coated polymer**
Y.M. Chung, M.J. Jung, and J.G. Han
Sungkyunkwan University, Suwon, Korea
- 6PB07 **Enhancement of Magnetoresistance by Inserted Nano Oxide Layer in Mn-Ir Bottom Spin Valve**
S.Y. Yoon, D.H. Lee, D.M. Jeon, Y.S. Kim, and S.J. Suh
Sungkyunkwan University, Suwon, Korea
- 6PB08 **Visible Photoluminescence from a-Si Based Alloy (a-SiN_x) Thin Films Deposited by Plasma Enhanced CVD**
J.K. Choi, D. Heo, I.K. Han, W.J. Choi, Y.J. Park, W.J. Cho, J.D. Song, J.I. Lee, and Y.D. Kim¹
Korea Institute of Science and Technology, Seoul, Korea
¹*Kyunghee University, Seoul, Korea*
- 6PB09 **Plasma Enhanced Chemical Vapor Deposition of Silicon Oxide Films and Silicon Oxynitride Films Using TMOS/O₂ /N₂ Gas and Plasma Diagnostics**
M. S. Kang, M. J. Lee, S. J. Kim, T.H. Chung, and Y. Kim
Dong-A University, Busan, Korea
- 6PB10 **Microcrystalline Silicon Growth Using a Inductive Coupled Plasma CVD on Plastic Substrate**
D.Y. Kim, C.K. Seo, M.S. Sim, C.H. Kim, S.J. Bae, and J.S. Yi
Sungkyunkwan University, Suwon, Korea
- 6PB11 **Determination of the Work Function of the Co Thin Films by Using γ -FIB System**
H.J. Oh, J.W. Hyun, Y.C. Lim, S.S. Kim, T.W. Kim, E.H. Choi, and S.O. Kang
Kwangwoon University, Seoul, Korea

- 6PB12 **The Characteristics of Dielectric Properties of SiOC Film with the Variation of Bonding Angle on the Si-O-C Structure**
C.S. Yang, Y.H. Yu, and C.K. Choi
Cheju National University, Jeju, Korea
- 6PB13 **Thermal Treatment of InGaAs/GaAs Self-Assembled Quantum Dots with PECVD-Grown SiO₂ Capping Layer**
S.H. Hwang, J.C. Shin, W.J. Choi¹, Y.M. Park, J.D. Song, Y.J. Park, I.K. Han, W.J. Cho, J.I. Lee, and W.J. Choe
Korea Institute of Science and Technology, Seoul, Korea
¹*Kyung Hee University, Yongin, Korea*
- 6PB14 **Detection Wavelength Tuning of Infrared-Photodetector by Thermal Treatment AlGaAs/GaAs Quantum Well with PECVD-Grown SiO₂ Capping Layer**
S.H. Hwang, J.C. Shin, W.J. Choi, Y.M. Park, J.D. Song, Y.J. Park, I.K. Han, W.J. Cho, and J.I. Lee, and H. Han¹
Korea Institute of Science and Technology, Seoul, Korea
¹*Pohang University of Science and Technology, Pohang, Korea*
- 6PB15 **Electroless Cu Deposition on NH₃ Plasma Treated TaN**
Y.S. Lee and J.W. Park
Hanyang University, Seoul, Korea
- 6PB16 **Recrystallization by Annealing on the Copper Films Deposited by Pulsed Electroplating on the ECR Plasma Cleaned Copper Seed Layer**
D. Kwon, H. Park, and C. Lee
Inha University, Incheon, Korea
- 6PB17 **Materials Surface Modification from the Point of View of Plasma Physicist**
A.F. Alexandrov¹, G.E. Bugrov, S.G. Kondranin, E. A. Kralkina, V.B. Pavlov, V.Yu. Plaksin¹, V.P. Savonov¹, A.V. Stepanov¹, and K.V. Vavilin
Plasma Tech. Co.,Ltd, Songnam, Korea
¹*Moscow State University, Moscow, Russia*
- 6PB18 **Nano-Surface Modification of Several Polymers by Low-energy Electron**
S.O. Cho and S.O. Chang
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 6PB19 **Atom Recombination on SiO₂ and Si(100) Surfaces**
U.Y. Kim, H. Soh, and Y.C. Kim
Hanyang University, Seoul, Korea
- 6PB20 **A Sputtering Type Neutral Loop Discharge Plasma**
Y.M. Sung, S. Atsuda, M. Otsubo, and C. Honda
Miyazaki University, Miyazaki, Japan

6PB21-6PB26: 5.3 Plasma Thrusters

- 6PB21 **The Miniaturization Numerical Study on Cylindrical Resonant Cavity of Microwave Plasma Thruster**
T. Jinlan, H. Hongqing, H. Xianwei, and M. Genwang
Northwestern Polytechnical University, Xian, China
- 6PB22 **Magnetically Insulated Inertial Confinement Concept for a Deep Space Mission**
M.J. Lee and T. Kammash¹
Hanyang University, Seoul, Korea,
¹*University of Michigan, Ann Arbor, MI, USA*

- 6PB23 **Antiproton Annihilation Dynamics for Advanced Space Propulsion**
M.J. Lee and T. Kammash¹
Hanyang University, Seoul, Korea,
¹ *University of Michigan, Ann Arbor, MI, USA*
- 6PB24 **D-He₃ Fuel Cycle for Space Propulsion System**
M.J. Lee
Hanyang University, Seoul, Korea
- 6PB25 **Design of Magnetic Nozzle for an Advanced RF Thruster**
T.S. Lee and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 6PB26 **Smooth Control of Electric Jet Propulsion**
R.K. Chuyan, V.V. Bagdasariyan, and A. P. Belousov
State Technical University, Moscow, Russia

Thursday Morning, 5 June 2003
8:15 am – Crystal Ballroom

Plenary Session:

**High Energy Density Physics (HEDP) Research at Sandia National
Laboratories**

Dr. Ray J. Leeper
Sandia National Laboratory

Chair: Dr. Christopher Deeney, *Sandia National Laboratory*

Thursday Morning, 5 June 2003
9:30 am – Crystal Ballroom I

Oral Session 7A: 5.6 Medical, Biological and Environmental Applications (II)

Chair: H. S. Uhm, *Ajou University*

- 7A01-02 **Invited – Apoptosis by Direct Electric Field (DEF) and Nanosecond Pulsed Electric Field (nsPEF) in Tumor Cells and Tumor Tissues**
H.B. Kim¹, S. Ahn^{1,2}, and S.B. Sim³
¹*Solco Biomedical Institute, Seoul, Korea*
²*Seoul National University, Seoul, Korea*
³*Korea Catholic University, Seoul, Korea*
- 7A03 **Influence of Electric Pulse Duration on the Action on a Biological Cell**
G. Yu, Y. Gao, Y. Wei, and S. Liu
University of Electronics Science and Technology of China, Chengdu, China
- 7A04 **Sterilization Using OH Radical Produced by Atmospheric Discharge Plasma**
Y. Imaizumi, K. Takashima, S. Katsura, and A. Mizuno
Toyohashi University of Technology, Toyohashi, Japan
- 7A05 **A Pilot-scale Experiment on the Kill of Red Tide Micro-Organisms Using Hydroxyl Radicals**
Z. Zhang, X. Bai, M. Bai, X. Zhou, B. Yang, and C. Yi
Dalian Maritime University, Dalian, China
- 7A06 **Low-Power μ Wave Plasma Source for Microsystems**
F. Iza and J.A. Hopwood
Northeastern University, Boston, MA, USA
- 7A07 **Biological Effects of Pulsed Streamer Discharge in Water**
S. Katsuki, T. Yokoyama, K. Shiraki, T. Namihira, H. Bluhm¹, and H. Akiyama
Kumamoto University, Kumamoto, Japan
¹*Research Center Karlsruhe, Karlsruhe, Germany*
- 7A08 **Plasma Surface Modification of Biomaterials Applied for Cardiovascular Devices**
N. Huang, Y.X. Leng, P. Yang, J.Y. Chen, H. Sun, G.J Wan, J. Wang, P. K Chu¹, and I. G Brown²
Southwest Jiaotong University, Chengdu, China
¹*City University of Hong Kong, Hong Kong, China*
²*Lawrence Berkeley National Laboratory, Berkeley, CA, USA*
- 7A09 **New Applications of Ion Assisted Reaction for Hydrophilic Surface Modification : Medical, Electronic and Packaging**
K.H. Kim, J.S. Cho, S. Han, D.H. Yeu, J.W. Seong, Y.W. Beag, and S.K. Koh
P & I Corporation, Seoul, Korea
- 7A10 **Plasma Spikes for the Mitigation of Shock Waves**
S. Kuo and D. Bivolaru
Polytechnic University, Brooklyn, NY, USA

Thursday Morning, 5 June 2003
9:30 am – Crystal Room II

**Oral Session 7B: 4.3 High Energy Density Hydrodynamics
6.3 Inertial Confinement**

Chair: L. J. Suter, *Lawrence Livermore National Laboratory*

- 7B01-02 **Invited – Fast Ignition Research towards Ignition and Burn at ILE Osaka University**
T. Yamanaka
Osaka University, Osaka, Japan
- 7B03-04 **Invited – Target Fabrication for Inertial Confinement Fusion and Fast Ignition**
A.L. Greenwood, J.L. Kaae, A. Nikroo, and D.A. Steinman
General Atomics, San Diego, CA, USA
- 7B05-06 **Invited – Progress in Direct-Drive Inertial Confinement Fusion at the Laboratory for Laser Energetics**
P.B. Radha, R. Betti, T.J.B. Collins, R.S. Craxton, J.A. Delettrez, R. Epstein, J.A. Frenje, V.Yu. Glebov, V.N. Goncharov, D.R. Harding, R.L. Keck, J.H. Kelly, T.J. Kessler, C.K. Li, J.A. Marozas, F.J. Marshall, P.W. Mckenty, J.P. Knauer, R.L. McCrory, D.D. Meyerhoger, R.D. Petrasso, S.P. Regan, T.C. Sangster, F.H. Seguin, S. Skupsky, V.A. Smalyuk, and C. Stoeckl
University of Rochester, Rochester, NY, USA
- 7B07-08 **Invited – Plasma-Wave System for Forming Intense Shock Waves**
K.V. Korytchenko¹, Y.D. Tur, L.I. Kosoj, S.M. Shkirida, and M.A. Krasnogolovets
Kharkiv Politechnical Institutue, Kharkiv, Ukraine
¹*Kharkiv Institute of Physics and Technology, Kharkiv, Ukraine*
- 7B09 **Consideration on the Scaling of Capillary Pinch Lasers**
K. Horioka, M. Nakajima, M. Masnavi, N. Sakamoto, Y. Hayashi, M.Watanabe, and E. Hotta
Tokyo Institute of Technology, Yokohama, Japan
- 7B10 **Computation of Pinch Current in the Filippov Type Plasma Focus**
V. Siahpoush, S. Sonhanian, S. Khorram, and M.A. Tafreshi¹
Tabriz University, Tabriz, Iran
¹*Atomic Energy Organization of Iran, Tehran, Iran*

Thursday Morning, 5 June 2003
9:30 am – Crystal Room III

Oral Session 7CA: 5.2 Thermal Plasma Chemistry & Processing (II)

Chair: J. Heberlein, *University of Minnesota*

- 7CA01-02 **Invited – Plasma Processes of Nuclear Waste Materials under Atmospheric – Pressure**
M. Suzuki and S. Mori
Tokyo Institute of Technology, Tokyo, Japan
- 7CA03 **Water-Cooled Electrostatic Probe Measurements on the Temperature Distributions of Electron and Heavy Particle in DC-RF Hybrid Plasma Jets**
J.H. Seo, J.S. Nam, T.H. Hwang, C.M. Lee, S.I. Choi, and S.H. Hong
Seoul National University, Seoul, Korea
- 7CA04 **Transition from Electrostatic to Electromagnetic Mode in Atmospheric Pressure RF Ar Inductively Coupled Plasma**
M.A. Razzak, K. Kondo, Y. Uesugi, and S. Takamura
Nagoya University, Nagoya, Japan
- 7CA05 **Properties of Hybrid Water/Argon DC Arc Torch under Reduced Pressure**
M. Hrabovsky, V. Kopecky, V. Sember, A. Chumak, and T. Kavka
Institute of Plasma Physics AS CR, Praha, Czech Republic
- 7CA06 **Optimization of Plasma Deposition Manufacturing Parameters Using a Hybrid ANN-Gas Method**
H. Zhang, J. Xu, and G. Wang
Huazhong University of Science and Technology, Wuhan, China
- 7CA07 **Cathode Erosion Mechanisms in an Oxygen Plasma Cutting Arc**
J. Peters, F. Yin¹, J. Heberlein, and C. Hackett²
University of Minnesota, Minneapolis, MN, USA
¹*Eaton Corp, Cleveland, USA*
²*Centricut W. Lebanon, NH, USA*
- 7CA08 **De-toxicity Characteristics of AC Submerged Arc Plasma Treated Air Cooled Slags from Industrial and Municipal Waste Incinerator**
J.S. Chang, K. Urashima, M. Ara, K. Oinuma¹, and G. Jinbo²
McMaster University, Hamilton, Canada
¹*Chubu Recycle Co., Nagoya, Japan*
²*Ebara Co., Tokyo, Japan*
- 7CA09 **Microwave Plasma Technology of Coal Ignition and Combustion**
D.M. Vavriv, P.M. Kanilo, V.I. Kazantsev¹, N.I. Rasyuk², and K. Schunemann³
National Academy of Sciences of Ukraine, Kharkov, Ukraine
¹*Moscow High Technical University after Bauman, Moscow, Russia*
²*Kharkov Central Design Bureau of the Minister of Fuel and Energy of Ukraine, Kharkov, Ukraine*
³*Technical University Hamburg-Harburg, Hamburg, Germany*

Thursday Morning, 5 June 2003
9:30 am – Charlotte Room

Oral Session 7CB: 5.4 Plasmas for Lightning

Chair: G. Zissis, *CPAT-Universite Paul Sabatier*

- 7CB01-02 **Invited – Prediction of HID Lamp Considering P-1 Radiation Model**
K.C. Paul, T. Takemura, H. Matsuno, T. Hiramoto, G. Zissis¹, A. Erraki², D. Lavers²,
and F. Dawson²
Ushio Inc , Gotenba, Japan
¹*University of Paul Sabatier, Toulouse, France*
²*University of Toronto, Toronto, Canada*
- 7CB03-04 **Invited – The Effect of Easily Ionized Additives on Mercury Arc Plasmas:
Transition from the Ionizing to the Recombining Phase**
D. Karabourniotis and E. Drakakis
University of Crete, Heraklion Crete, Greece
- 7CB05-06 **Invited – Acoustic Resonance in High Pressure Discharge Lamps**
S. Bhosle, J.B. Rouffet, and G. Zissis
Université Paul Sabatier, Toulouse, France
- 7CB07 **The Development of a Powerful Vortex Stabilized Flash Lamp for RTP**
T. Thrum, D. Camm, A. Hewett, and G. Stuart
Vortek Industrial Ltd, Vancouver, Canada
- 7CB08 **Mercury-Free HID Lamps Containing ScI₃-NaI-InI₃ For Automobiles**
K. Takahashi and M. Horiuchi
Matsushita Electric Industrial Co., Ltd., Kyoto, Japan
- 7CB09 **Characteristics of Positive Column Contraction of Xenon Fluorescent Lamps with
Two-pairs of Electrodes in Pulsed Discharge**
H. Motomura, M. Jinno, K. H. Loo, and M. Aono
Ehime University, Matsuyama, Japan
- 7CB10 **Broadband White Light Generated by Microwave Discharges of a Diatomic
Molecular Vapor (InBr)**
J.J. Kim, D.H. Won, J.T. Ko, J.W. Kim¹, and S. Hong¹
Sejong University, Seoul, Korea
¹*Taewon Lighting Laboratory, Seoul, Korea*

**Thursday Morning, 5 June 2003
9:30 am – Pearl Room**

Oral Session 7D: 4.2 Fast Z-Pinches and Radiation Sources

Chair: K. Horioka, Tokyo Institute of Technology

- 7D01-02 **Invited – Energetics and Heating of High Current Impeding Z-Pinches**
C. Deeney, C.A. Coverdale, P.D. LePell, B.M. Jones, K.G. Whitney¹, J.W. Thornhill¹, J.P. Apruzese¹, J. Giuliani¹, A. Velikovish¹, J. Davis¹, and D.L. Peterson²
Sandia National Laboratories, Albuquerque, NM, USA
¹*Naval Research Laboratories, Washington, DC, USA*
²*Los Alamos National Laboratory, Los Alamos, NM, USA*
- 7D03-04 **Multi-kilovolt X-ray Sources Created by Intense Lasers**
C.A. Back, C. Constantin, M.C. Miller, J.F. Davis¹, J. Grun², O.L. Landen, W.W. Hsing, and L.J. Suter
Lawrence Livermore National Laboratory, Livermore, CA, USA
¹*Alme Associates, Alexandria, VA, USA*
²*Naval Research Laboratory, Washington, DC, USA*
- 7D05 **The Effects of Initial Load Radius on High Photon Energy Nested Wire Arrays at the Z Accelerator**
C. Coverdale, C. Deeney, P. D. LePell¹, J. Davis², Y.K. Chong², R.W. Clark², J.P. Apruzese², J.W. Thornhill², and K.G. Whitney^{2,3}
Sandia National Labs, Albuquerque, NM, USA
¹*Ktech Corporation, Albuquerque, NM, USA*
²*Naval Research Lab, Washington, DC, USA*
³*Berkeley Research Associates, Washington, DC, USA*
- 7D06 **A 6 MV Rod-Pinch Experiment on ASTERIX**
C. Vermare, J. Delvaux, Y. Hordé, E. Merle, R. Nicolas, D. Noré, O. Pierret, R. Rosol, Y. Tailleux, L. Véron, F. Bayol¹, A. Garrigues¹, C. Delbos¹, R.J. Comisso², F.C. Young², R.J. Allen², D. Mosher², S.B. Swanekamp², G. Cooperstein², B.V. Oliver³, D.R. Rose³, D. Rovang³, D.L. Johnson³, J. Maenchen³, and K. Prestwich³
Commissariat a l'Energie Atomique(CEA), Pontfaverger-Moronvilliers, France
¹*Centre d'Etudes de Gramat, Gramat, France*
²*Naval Research Laboratory, Washington, DC, USA*
³*Sandia National Laboratories, Albuquerque, NM, USA*
- 7D07 **Determination of the Size and Geometry of the X-pinch X-ray Source Using Microfabricated Structures, and Applications of This Source to High-Resolution Imaging of a Variety of Objects**
B. Song, S.A. Pikuz¹, T.A. Shelkovenko¹, K.M. Chandler, M.D. Mitchell, and D.A. Hammer
Cornell University, Ithaca, USA
¹*Lebedev Physical Institute, Moscow, Russia*
- 7D08 **Pre-discharge-One of the Key Conditions for Soft X-ray Amplification in the Fast Gas-filled-capillary Discharge**
K. Kolacek, J. Schmidt, V. Prukner, V. Bohacek, M. Ripa, P. Vrba, and O. Frolov
Academy of Science of the Czech Rep, Prague, Czech Republic
- 7D09 **Effect of Insulator Sleeve Length on Soft X-ray Emissions from Dense Plasma Focus Device**
C.B.L. Phua¹, J.X.Y. Then¹, X. Lin², K.A. Chandra³, P. Lee, S. Lee⁴, and R.S. Rawat
Nanyang Technological University, Nanyang, Singapore
¹*Raffles Girl's School, Anderson Road, Singapore*
²*Hwa Chong Junior College, Bukit Timah, Singapore*

³*Anglo Chinese Junior College, Dover Close East, Singapore*

⁴*International Center for Dense Magnetized Plasma, Warsaw, Poland*

7D10 **Shadowgraphic Studies of DLC Film Deposition Process in Dense Plasma Focus Device**

L.Y. Soh, P. Lee, X. Shuyan, S. Lee¹, and R.S. Rawat

Nanyang Technological University, Nanyang, Singapore

¹*International center for Dense Magnetized Plasma, Warsaw, Poland*

7D11 **Non-ablative Capillary Discharges for Guiding of Laser Pulses**

J. Kaiser, S.V. Kukhlevsky¹, A. Ritucci², G. Tomassetti², M. Liska, O. Samek,

A. Reale², L. Palladino², F. Flora³, and L. Mezi³

Brno University of Technology, Brno, Czech Republic

¹*University of Pecs, Pecs, Hungary*

²*Univ. of L'Aquila, L'Aquila, Italy*

³*Centro Ricerche Frascati, Italy*

Thursday Morning, June 5 2003
9:30 am – Ruby Room

Oral Session 7E:1.4 Computational Plasma Physics

Chair: T. Makabe, Keio University

- 7E01-02 **Invited – Simulations of Capacitively Coupled Single- and Dual-Frequency RF Discharges**
J.K. Lee, H.C. Kim, N. Babaeva, O. Manuilenko, and J.W. Shon¹
Pohang University of Science and Technology, Pohang, Korea
¹*LAM Research Corporation, Fremont, CA, USA*
- 7E03 **Modeling of N₂/H₂ Plasma for Low K- material Etching in a Capacitively Coupled Plasma Device**
C.H. Shon and T. Makabe
Keio University, Yokohama, Japan
- 7E04 **An Investigation of Efficient Grid-less Treecode Poisson Solvers for Charged Particle Simulations**
A.J. Christlieb, R. Karsny, and J.P. Verboncoeur¹
University of Michigan, Ann Arbor, MI, USA
¹*University of California, Berkeley, CA, USA*
- 7E05 **3D Simulations of an Industrial ICP Reactor with Comparison to Experimental Data**
V. Kolobov, K. Ikeda¹, and T. Okumura²
CFD Research Corporation, Huntsville, USA
¹*Wave Front Co., Ltd., Yokohama, Japan*
²*Matsushita Electric Industrial Co., Ltd., Osaka, Japan*
- 7E06 **Monte Carlo Simulation of Streamer Propagation with E-E and E-E-Ion Collision**
M. Chung and E. Kunhardt¹
Southern Taiwan University of Technology, Tainan, Taiwan
¹*Steven Institute of Technology, Hoboken, NJ, USA*
- 7E07 **Phasing Effects of Dual RF Voltage Waves on Plasma Properties in a Capacitively Coupled Plasma Reactor**
H.C. Kim, Y. T. Sul, and V. Manousiouthakis²
Hoseo University, Asan, Korea
¹*University of California, Los Angeles, CA, USA*
- 7E08 **On Rapid Computation of Time Periodic Steady State for Simulation of Capacitively Coupled RF Plasma**
H.C. Kim, Y.T. Sul, and V. Manousiouthakis¹
Hoseo University, Asan, Korea
¹*University of California, Los Angeles, CA, USA*
- 7E09 **Calculation of Optical Properties of Low-temperature Plasma**
F. N. Borovik, A.V. Ostriki¹, and G. S. Romanov
Luikov Heat and Mass Transfer Institute, Minsk, Byelorussia
¹*Institute for Problems of Chemical Physics RAS, Moscow, Russia*
- 7E10 **Study on RF Magnetron Discharges of Oxygen/Argon Mixture by the Particle-in-Cell/Monte Carlo Method**
S. Yonemura and K. Nanbu
Tohoku University, Sendai, Japan
- 7E11 **Numerical Study on Plasma Confinement by Multipolar Magnetic Fields**
K. Nanbu and H. Takekida
Tohoku University, Sendai, Japan

Thursday Morning, June 5 2003
9:30 am – Emerald Room

Poster Session 7PA01-49: 6.1 Tokamak, Stellarator, Spherical Torus
6.5 Heating and Current Drive Systems
6.2 Alternative Concepts(Pinches, Linear Machines, etc.)
6.3 Inertial Confinement
4.3 High Energy Density Hydrodynamics
6.4 Fusion Plasma Diagnostics

7PA01-7PA11: 6.1 Tokamak, Stellarator, Spherical Torus

- 7PA01 **Transient Operating Characteristics for the KSTAR TF Superconducting Magnet**
Q. Wang¹, W. Chung, and K. Kim²
Korea Basic Science Institute, Daejeon, Korea
¹*CAS, Beijing, China*
- 7PA02 **Simulation of Plasma Evolution in the Initial Phase of Inductive Tokamak Startup**
J. Kim and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea
- 7PA03 **Radial Electric Field Control by Biased Hot Cathode in Tohok University Heliac**
S. Kitajima, H. Takahasi, Y. Tanaka, H. Hashizume, and M. Sasao
Tohoku University, Sendai, Japan
- 7PA04 **Helicon Wave Plasma Production in CHS (Compact Helical System)**
T. Shoji, H. Kikuchi, T. Sakawa, C. Suzuki¹, G. Matsunaga¹, and K. Toi¹
Nagoya University, Nagoya, Japan
¹*National Institute for Fusion Science, Toki, Japan*
- 7PA05 **Tokamak Equilibrium Solver by Neutral Network Algorithm**
Y.M. Jeon, Y. S. Park, and Y. S. Hwang
Seoul National University, Seoul, Korea,
- 7PA06 **Two-Dimensional Numerical Model for Coupled Core-Edge-SOL Transport Simulations in Tokamak Plasma**
J. M. Park, S.H. Kim, J. S. Ko, and S.H. Hong
Seoul National University, Seoul, Korea
- 7PA07 **Observation of Radial Propagation of Drift Waves in the STOR-M Tokamak**
A.K. Singh, J.E. Morelli, T. Asai, and A.K. Hirose
University of Saskatchewan, Saskatoon, Canada
- 7PA08 **Numerical Analysis on Neutral Beam Injection Scenario for Advanced Tokamak Operation of KSTAR Tokamak**
S.H. Kim, J.M. Park, and S.H. Hong
Seoul National University, Seoul, Korea,
- 7PA09 **Numerical Simulation on MARFE Development in a Diverted Tokamak with a Coupled Plasma, Neutral, and Impurity Transport Code**
J.S. Ko, D.K. Kim¹, and S.H. Hong
Seoul National University, Seoul, Korea,
¹*Agency for Defense Development, Daejeon, Korea*

7PA10 Plasma Position Control Simulation with a Simple Model for New Control Coil System of KSTAR Tokamak
Y.S. Park, Y.M. Jeon, H. Jhang¹, S.K. Kim and Y.S. Hwang
Seoul National University, Seoul, Korea,
¹*Korea Basic Science Institute, Daejeon, Korea*

7PA11 Poloidal Velocity Shear and Decorrelation of the Edge Fluctuations in Tokamak
S.K. Saha and R. Kumar
Saha Institute of Nuclear Physics, Kolkata, India

7PA12-7PA20: 6.5 Heating and Current Drive Systems

7PA12 Status of Transmitter Development for KSTAR ICH System
J. G. Kwak, S.J. Wang, Y.D. Bae, J.S. Yoon, B.G. Hong, and C.K. Hwang
Korea Atomic Energy Research Institute, Daejeon, Korea

7PA13 High Power RF Test of Liquid Phase Shifter for KSTAR Tokamak
J.S. Yoon, Y.D. Bae, J.G. Kwak, and B.G. Hong
Korea Atomic Energy Research Institute, Daejeon, Korea

7PA14 Hybrid Method for RF Heating Problem of Mirror Confinement Machine
B.H. Park, K.I. You, J.Y. Kim, and M. Kwon
Korea Basic Science Institute, Daejeon, Korea

7PA15 KSTAR ICRF Antenna Development on the KAERI Test Facility
Y.D. Bae, J.G. Kwak, J.S. Yoon, S.U. Jeong, and B.G. Hong
Korea Atomic Energy Research Institute, Daejeon, Korea

7PA16 Development of the Solid State Amplifier for Magnetic Confined Fusion Application
J.G. Kwak, W.C. Choi, and C.K. Hwang
Korea Atomic Energy Research Institute, Daejeon, Korea

7PA17 Particle-in-Cell Simulation on Power Coupling of Grill for KSTAR 5.0-GHz LHCD Launcher
Y.S. Bae, M.H. Cho, and W. Namkung
Pohang University of Science and Technology, Pohang, Korea

7PA18 A 1.5MW, 110 GHz High Efficiency Gyrotron for Tokamak Plasma Heating
E. Choi, J.P. Anderson, M.A. Shapiro, and R.J. Temkin
Massachusetts Institute of Technology, Cambridge, MA, USA

7PA19 An Equivalent Circuit Model of HANBIT RF-Heating System
N.S. Yoon, B.H. Park¹, S.S. Kim¹, and J.Y. Kim¹
Chungbuk National University of Korea, Cheongju, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*

7PA20 Macroscopic Analysis of NB Cooling Water System for the KSTAR NBI system
B.J. Yoon, S.R. In, and B.H. Oh
Korea Atomic Energy Research Institute, Daejeon, Korea

7PA21-7PA25: 6.2 Alternative Concepts (Pinches, Linear Machines, etc.)

7PA21 Continued Hot-Electron Plasma Studies in the Hanbit Tandem Mirror Plug
J.S. Hong, A.C. England, M. Kwon, M.C. Kyeum, and Hanbit Team
Korea Basic Science Institute, Daejeon, Korea

7PA22 **Effect of Radio Frequency Sideband Coupling on Dissipative Low Frequency Electrostatic Instabilities in Mirror Plasmas**
S.S. Kim and H. Jhang
Korean Basic Science Institute, Daejeon, Korea

7PA23 **Characteristics of Neutron Source Based on Radially Convergent Beam Fusion**
K. Yamauchi, M. Watanabe, A. Okino, T. Kohno, and E. Hotta
Tokyo Institute of Technology, Yokohama, Japan

7PA24 **Analysis of Chaotic Behavior in Reversed Field Pinch Plasma**
M. Watanabe, M. Sugibuchi, H. Sakakika, and Y. Yagi¹
Iwata University, Morioka, Japan
¹*AIST Tsukuba Central 1, Tsukuba, Japan*

7PA25 **Development of an Impedance Monitoring System for the Hanbit Device**
S.Y Kim., T. Lho¹, and K.S. Chung
Hanyang University, Seoul, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*

7PA26-7PA27: 6.3 Inertial Confinement

7PA26 **The Calculation of Energy Gain in Central Spark Ignition and the Effects of Different Parameters on it**
A. Ghasemi-Zad
University of Guilan, Rasht, Iran

7PA27 **Temperature and Density Measurement by Using a Double Probe of Pseudospark Discharge Plasma Jet**
T. Kamada, M. Watanabe, K. Miura, N. Matsukawa, T. Ishikawa, and M. Itagaki
Iwata University, Morioka, Japan

7PA28-7PA29: 4.3 High Energy Density Hydrodynamics

7PA28 **Dynamics of Plasma Stream in Transverse Magnetic Field**
A.P. Smakhtin
Moscow Aviation Institute (State Technical University), Moscow, Russia

7PA29 **Research of Asymmetry of Radiation Drive Implosion on ShenGuang II Laser Facility**
G. Yaoming, L. Meng, and L. Yunsheng
Institute of Applied Physics and Computational Mathematics, Beijing, China

7PA30-7PA49: 6.4 Fusion Plasma Diagnostics

7PA30 **Calibration of the KSTAR ECE system**
S.H. Jeong, C.K. Hwang, and I.Y. Kim
Korea Atomic Energy Research Institute, Daejeon, Korea,

7PA31 **Development of Microwave Imaging Reflectometer with Tapered Slot Antenna Array**
K. Hattori, D. Kudo, H. Tsugueda, O. Takabatake, A. Ando, and M. Inutake
Tohoku University, Sendai, Japan

7PA32 **Application of Ultrashort-Pulse Reflectometry to Large Helical Device**
Y. Kogi, A. Mase, S. Ohsako, M. Ignatenko, T. Yasuda, L.G. Bruskin¹, H. Hojo²,
T. Tokuzawa³, S. Inagaki³, Y. Nagayama³, and K. Kawahata³
Kyushu University, Kasuga, Japan
¹*Japan Atomic Energy Research Institute, Naka, Japan*
²*University of Tsukuba, Tsukuba, Japan*
³*National Institute for Fusion Science, Toki, Japan*

- 7PA33 **A Millimeter Wave Beam Shaping Phased Antenna Array Proposed for Imaging Reflectometry**
 C.C Chang, C.W. Domier, N.C. Luhmann Jr., H. Park¹, and T. Munsat¹
University of California, Davis, CA, USA
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 7PA34 **Hybrid Antenna Imaging Arrays for Plasma Imaging**
 Z. Xia, C.W. Domier, N.C. Luhmann, S. Nookala Jr., T. Munsat¹, and H. Park¹
University of California, Davis, CA, USA
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 7PA35 **Fluctuation Measurements of the Ultrashort Pulse Reflectometry System on SSPX**
 C.W. Domier, Y. Roh, N.C. Luhmann, Jr, S. Woodruff¹, D.N. Hill¹, and E.B. Hooper¹
University of California, Davis, CA, USA
¹*Lawrence Livermore National Laboratory, Livermore, CA, USA*
- 7PA36 **Fluctuation Measurements on TEXTOR Using Microwave Imaging Techniques**
 T. Munsat, E. Mazzucato, H. Park, C. Domier¹, N.C. Luhmann, Jr¹, A.J.H. Donne²,
 and M.J. van de Pol²
Princeton Plasma Physics laboratory, Princeton, NJ, USA
¹*University of California, Davis, CA, USA*
²*FOM-Institute voor Plasmafysica Rijnhuizen, Netherlands*
- 7PA37 **Unique Diagnostic Developments with Tracer-encapsulated Pellet Injection**
 S. Sudo, N. Tamura, D. Kalinina, P. Goncharov, V. Sergeev, K. Sato, S. Muto,
 S. Inagaki, S. Kato, and LHD Team
National Institute for Fusion Science, Toki, Japan
- 7PA38 **Fast Reciprocating Langmuir probe Assembly for KSTAR**
 J.G. Bak, S.G. Lee, and KSRAR Team
Korea Basic Science Institute, Daejeon, Korea
- 7PA39 **Research and Development of KSTAR Magnetic Diagnostics in the Magnetic Diagnostic Installation Chamber**
 S.G. Lee and J. G. Bak
Korea Basic Science Institute, Daejeon, Korea
- 7PA40 **Measurements of Parallel and Poloidal Velocity by Using Visco-Mach Probe in Hanbit Mirror Device**
 G.Y. Kwak, Y.S. Choi, K.S. Chung, J.G. Bak¹, S.G. Lee¹, and M. Kwon¹
Hanyang University, Seoul, Korea
¹*Korea Basic Science Institute, Daejeon, Korea*
- 7PA41 **Design Consideration on Ex-Vessel Neutron Yield Monitor for ITER**
 K. Asai, T. Iguchi, and T. Nishitani¹
Nagoya University, Nagoya, Japan
¹*Japan Atomic Energy Research Institute, Naka, Japan*
- 7PA42 **Development of a Tomographic Reconstruction Method and Test for Soft X-ray Array Diagnostic for KSTAR plasmas**
 J. Kim and W. Choe
Korea Advanced Institute of Science and Technology, Daejeon, Korea

- 7PA43 **Data Acquisition and Analysis of 2D Spectra of Helium-like Argon from a New X-ray Imaging Crystal Spectrometer at the National Spherical Torus Experiment**
 S.G. Lee, J.G. Bak, M. Bitter¹, K. W. Hill¹, L. Roquemore¹, P. Beiersdorfer², D. Thorn², M.F. Gu³, M.K. Moon⁴, U.W. Nam⁵, K.C. Jin⁵, K.N. Kong⁵, and K.I. Seon⁵
Korea Basic Science Institute, Daejeon, Korea
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
²*Lawrence Livermore National Laboratories, Livermore, CA, USA*
³*MIT, Cambridge, MA, USA*
⁴*Korea Atomic Energy Research Institute, Daejeon, Korea*
⁵*Korea Astronomy Observatory, Daejeon, Korea*
- 7PA44 **Engineering Design Description of Diagnostic Cassettes for Bay J for KSTAR**
 H.K. Na, M.Kwon, D.C. Seo, K.M. Young¹, G. Gettelfinger¹, T. Brown¹, H.K. Park¹, D.W. Johnson¹, L. Morris¹, and R.A. Ellis¹
Korea Basic Science Institute, Daejeon, Korea
¹*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*
- 7PA45 **VUV Spectral lines of C and Ne ions Measured in LHD at NIFS**
 T. Kato, M. Kato, R. More, I. Murakami, K. Ida, M. Goto, and S. Morita
National Institute of Fusion science, Toki, Japan
- 7PA46 **The Anisotropy of Ion Temperature and the Radial Temperature of the End Loss Ion in the Hanbit Mirror Plasma Heated by ICRF**
 W.H. Ko, S.J. Yoo, K.-I. You, and M. Kwon
Korea Basic Science Institute, Daejeon, Korea
- 7PA47 **Ion Temperature Measurement by using H α Line Broadening in Hanbit Mirror Device**
 S.J. Yoo, W.H. Ko, and H.L. Yang
Korea Basic Science Institute, Daejeon, Korea
- 7PA48 **Gamma-Ray Induced Absorption in Optical Fibers Used for Plasma Diagnostics**
 D.G. Sporea
National Institute for Laser, Magurele, Japan
- 7PA49 **Investigation of Gas Parameters at the Final Stage of Spark Channel Evolution**
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