Monday, 1 June 1992
9:45 a.m. - Ballroom D
Oral Session 1A: Magnetohydrodynamics and Basic Plasma Phenomena and Plasma Waves
Session Chairperson: O. Ishihara

1A1-2 Invited

The Development of the Fiber Theory of Plasmas

N.A. Salingaros
Department of Mathematics, Southern Methodist University, Dallas, TX and the University of Texas at Arlington, Arlington, TX

1A3 **Modeling of the Free Space and Focused Magnetic Field Profiles of the ORNL Super Conducting Motor**

J.M. Bailey,[1] M. Rader,[1] C.W. Sohns,[2] J. McKeever[2] and S.W. Schwenterly[2]
[1]University of Tennessee, Knoxville, TN
[2]Oak Ridge National Laboratory, Oak Ridge, TN

1A4 **Non-Equilibrium Ionization of Cesium-Seeded Helium**

M.E. Talaat
Department of Mechanical Engineering, University of Maryland, College Park, MD

1A5 **The Importance of the "½" in 2½ Dimensional MHD Simulations of Compact Toroids**

R.E. Peterkin, Jr.
Phillips Laboratory, Kirtland AFB, NM

1A6 **A Theoretical Investigation of the Onset of Anomalous Diffusion in Electronegative Discharges**

D.E. Bell[1] and W.F. Bailey[2]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Air Force Institute of Technology, Wright-Patterson AFB, OH

1A7 **New Technique for the Solution of the Problem of Forced Oscillations in a Vlasov Plasma**

V. Colombo, G. Coppa, G. Dellapiana, G. Lapenta and P. Ravetto
Dipartimento di Energetica, Torino, Italy

1A8 **Chirikov-Taylor Model for Particle Diffusion in Plasma Turbulence**

H. Xia and O. Ishihara
Department of Electrical Engineering, Texas Tech University, Lubbick, TX

Oral Session 1A: Magnetohydrodynamics and Basic Plasma Phenomena & Plasma Waves (continued)

1A9 **A Thermal Instability in ECRH Plasma**

S.P. Kuo[1] and M.C. Lee[2]
[1]Weber Research Institute, Polytechnic University, Farmingdale, NY
[2]Plasma Fusion Center, MIT, Cambridge, MA

1A10-11 **Invited**

Frequency-Upshifted Langmuir Modes Produced by RF Heating of Ionospheric Plasmas

M.C. Lee,[1] K.D. Vilece,[1] Y.R. Dalkir,[1] K.M. Groves[1] and S.P. Kuo[2]
[1]Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA
[2]Weber Research Institute, Polytechnic University, Farmingdale, NY

Monday, 1 June 1992
Oral Session 1B: Electrical Gas Discharges
9:45 a.m. - Ballroom E
Session Chairperson: William Nunnally

1B1 **Mechanisms of Anode Power Deposition in a Low Pressure Free Burning Arc**

G.C. Soulas[1] and R.M. Myers[2]
[1]Ohio State University, Columbus, OH
[2]Sverdrup Technology, Inc., NASA Lewis Research Center Group,
Brook Park, OH

1B2 **Measurements of Operating and Bias Voltages of a Parallel Plate RF Discharge with a Magnetic Field Parallel to the Driven Electrode**

P. Bletzinger
Aero Propulsion and Power Directorate, WPAFB, Ohio

1B3-4 **Invited**

Streamers in Gases

P.F. Williams
University of Nebraska-Lincoln, Lincoln, NE

1B5 **Multi-Dimensional Modeling of the Dynamic Morphology of Streamer Coronas**

P.A. Vitello, B.M. Penetrante and J.N. Bardsley
Lawrence Livermore National Laboratory, Livermore, CA

Monday, 1 June 1992
11:00 a.m. - Ballroom E
Oral Session 1B: Plasmas For Lighting
Session Chairperson: Voitek W. Byszewski

1B6-7 **Invited**

Model and Microwave Driven Discharge: Starting and Steady State Operation

Y.M. Li
GTE Laboratories Incorporated, Waitham, MA

1B8 **Starting of Metal Halide Lamps**

W.W. Byszewski, Y.M. Li, A.B. Budinger and P.D. Gregor
GTE Laboratories Incorporated, Waltham, MA

1B9 **Thermionic ARC Initiation**

O. Biblarz
Naval Postgraduate School, Monterey, CA

1B10 **A Method of Studying Electrode and Plasma Voltages in High Pressure Sodium Lamps**

R. Geens and E. Wyner
GTE Electrical Products, GTE Sylvania, Tienan, Belgium

1B11 **A Simple Analysis of an Electrodeless Inductive Low Pressure Discharge Based on External Electrical Measurements**

R.B. Piejak, V.A. Godyak and B.M. Alexandrovich
GTE Laboratories Inc., Waltham, MA

1B12 **A Time-Dependent Kinetic Model of a Xenon Flashlamp**

A. E. Rodriguez
Tetra Corporation, Albuquerque, New Mexico

Monday, 1 June 1992
9:45 a.m. - Ballroom F
Oral Session 1C: Electron, Ion and Plasma Sources
Session Chairperson: André Anders

1C1-2 **Invited**

18 GHz ECR Ion Sources at the CEN Grenoble

A. Girard, C. Barue, F. Bourg, P. Briand, J. Debernardi, M. Delaunay, D. Hitz, J.P. Klein, P. Ludwig, J.M. Mathonnet, G. Melin, T.K. Nguyen, L. Pin and M. Pontonnier
Départemente de Recherche sur la Matière Condensée, Centre d'Etudes Nucléarires de Grenoble, Grenoble, France

1C3-4 **Invited**

Physics and Technique of the Plasma Cathode Electron Sources

E.M. Oks
High Current Electronic Institute of the Russian Academy of Sciences, Siberian Division, Tomsk, Russia

1C5 **Ion Formation in Vacuum Arc Cathode Spots**

A. Anders, S. Anders[1], A. Förster[2]
[1]Lawrence Berkeley Laboratory, University of California, Berkeley, CA
[2]Institut für Theoretische Physik, Humboldt-Universität zu Berlin, Berlin, Germany

1C6 **An Investigation of the Performance of ECR Plasma Sources Versus Reactor Size**

F.C. Sze and J. Asmussen
Department of Electrical Engineering, Michigan State University, East Lansing, MI

1C7 **Experimental Study of the Influence of Plasma Confinement Conditions on Ions in a Multipolar ECR Plasma Reactor**

G.L. King, P. Mak, T.A. Grotjohn and J. Asmussen
Department of Electrical Engineering, Michigan State University, East Lansing, MI

Monday, 1 June 1992
11:30 a.m. - Ballroom F
Oral Session 1C: Electromagnetic and Electrothermal Launchers
Session Chairperson: Mary Baker

1C8 **Dynamic Load Influences On Pulse Formation for Electromagnetic and Electrothermal Launchers**

D. Bhasavanich, H.G. Hammon and F.T. Warren
Physics International Company, San Leandro, CA

1C9 **Observations on the Effect of Current Per Unit Rail Height on Plasma Armature Length**

D.P. Bauer, B.L. Maas and N.D. Clements
IAP Research, Inc., Dayton, OH

1C10 **Lorentz Forces the LLNL Plasma Armature Railgun**

Mjr. M.L. Huebschman
Innovative Science and Technology Directorate, Strategic Defense Initiative Organization, Washington, DC

1C11 **Microwave Diagnostics on a Railgun Plasma Armature**

G. Grant, P.M. Day and M.C. Baker
Pulsed Power EE Department, Texas Tech University, Lubbock, Texas

Monday, 1 June 1992
12:45 a.m. - Ballroom F
Oral Session 1C: Environmental/Energy Issues in Plasma Science
Session Chairperson: James Mark

1C12-13 **Invited**

Global Change and Possible Effects on the Earth's Plasma Environment

R.G. Roble
High Altitude Observatory, National Center for Atmospheric Research, Boulder, CO

1C14 **Conservation and Fusion as Solutions for the Greenhouse or Global Warming Effect**

James W-K. Mark
International Institute for Energy and Environment, Princeton, NJ

Monday Morning, 1 June 1992
Poster Session 1P1-7: Intense Electron and Ion Beams

1P1 **Time-Resolved Emittance and Energy Measurements of a Microsecond Electron Beam**

M. Skopec,[1] R.F. Schneider,[1] J.L. Price,[1] D.J. Weidman[2] and M.J. Rhee[2]
[1]Naval Surface Warfare Center, White Oak Laboratory, Silver Spring, MD
[2] ATR Corp., Laurel, MD, and University of Maryland, College Park, MD

1P2 **Results from the Electron-Beam Radius-Tailoring Experiment with a Fast Focusing Coil**

D.J. Weidman,[1] M.J. Rhee,[1] R.F. Schneider,[2] K.T. Nguyen[3] and R.A. Stark[2]
[1]University of Maryland, College Park, and ATR Corp., Laurel, MD
[2]Naval Surface Warfare Center/White Oak, Silver Spring, MD
[3]Mission Research Corporation, Newingtown, VA

1P3 **Brightness Measurements of Electron Beam Photoemitted Multicrystalline L_aB_6**

J. Shi,[1] M. Qian,[2] Z. Tao,[2] M. Yang,[2] K. Hu,[2] X. Liu,[2] J. Cheng,[3]
Q. Ran,[3] Z. Liu[3] and Q. Sao[3]
[1]Southwest Institute of Fluid Physics, Chengdu, Sichuan, China
[2]Southwest Institute of Applied Electronic, Chengdu, Sichuan, China
[3]University of Electronic Science of China, Chengdu, Sichuan, China

1P4 **Longitudinal Instabilities of Intense Beams in a Transport Channel with Complex Wall Impedances**

J.G. Wang and M. Reiser
Laboratory for Plasma Research, University of Maryland, College Park, MD

1P5 **Controlling Beam Divergence in Applied-B Ion Diodes**

T.D. Pointon and M.P. Desjarlais
Sandia National Laboratories, Albuquerque, NM

1P6 **Simulation Study of Magnetically Insulated Power Coupling to the Applied-B Ion Diode**

S.E. Rosenthal
Sandia National Laboratories, Albuquerque, NM

1P7 **Channel-Accelerating Gap Interaction and Beam Acceleration and Transport Experiments with the Recirculating Linear Accelerator (RLA)**

M.G. Mazarakis,[1] D.L. Smith,[1] J.W. Poukey,[1] J.S. Wagner,[1] L.F. Bennett,[1]
W.R. Olson,[1] B.N. Turman,[1] K.R. Prestwich,[1] J. Wells[2] and K. Struve[3]
[1]Sandia National Laboratories, Albuquerque, NM
[2]Science Application International Co., Albuquerque, NM
[3]Mission Research Corporation, Albuquerque, NM

Monday Morning, 1 June 1992
Poster Session 1P8-13: Microwave Plasma Interactions

1P8 **Microwave Interactions with Relativistic Electron Beams**
P.R. Bolton, R. Anderson, R. Lear and B. Poole
Lawrence Livermore National Laboratory, Livermore, CA

1P9 **Numerical Study of the Propagation of High Power Microwave Pulses in Air Breakdown Environment**
J. Kim and S.P. Kuo
Weber Research Institute, Polytechnic University, Farmingdale, NY

1P10 **Experimental Studies of Nonlinear Wave Propagation and Interactions with Magnetized Plasmas**
M.C. Lee,[1] D.T. Moriarty,[1] M. Onozuka,[1] K.D. Vilece,[1] R.R. Parker[1] and S.P. Kuo,[2]
[1]Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA
[2]Weber Research Institute, Polytechnic University, Farmingdale, NY

1P11 **Design, Construction, and Testing of Non Constant Frequency Shifting Devices**
M. Rader and I. Alexeff
University of Tennessee, Knoxville, TN

1P12 **Experiments and Analysis of Wave Propagation, Absorption and Backscattering in Plasmas**
J.E. Scharer, Y.S. Zhang, N.T. Lam, M.H. Bettenhausen, O.C. Eldridge, S.F. Chang and J. Joe
Electrical and Computer Engineering, University of Wisconsin, Madison, WI

1P13 **Models for Anomalous Reductions of Backscatter of Microwaves by an Isotropic Pulsed Plasma in Front of a Metal Plate**
A. Singh, W.W. Destler, P. Catravas and J. Rodgers
Laboratory for Plasma Research, University of Maryland, College Park, MD

Monday Morning, 1 June 1992
Poster Session 1P14-17: Magnetic Fusion

1P14 **Fast Computational Scheme for Feedback Control of High Current Fusion Tokamaks**

J.Q. Dong,[1] R. Khayrutdinov,[2] E. Azizov,[2] R. Carrera,[4] S. Jardin,[3] and E. Montalvo[4]
[1]IFS, University of Texas at Austin, TX
[2]TSP Group, Kurchatov Institute, Troisk, Russia
[3]PPPL Princeton, NJ
[4]Valley Research Corporation, Austin, TX

1P15 **Proposal for Magnetic Field Measurements in Tokamak Plasmas**

V.P. Gavrilenko
All-Union Research Centre for Study of Surface and Vacuum, Moscow, Russia

1P16 **Growth of Resistive Wall Modes in an RFP**

P. Greene and S. Robertson
Department of Astrophysical, Planetary, and Atmospheric Sciences, University of Colorado, Boulder, CO

1P17 **Non-neutral Tokamak Plasma with Enhanced Energy Gain**

C.A. Ordonez,[1] D. Booth,[2] R. Carrera,[2] G. Miley,[3] E. Montalvo,[2] and Y. Watanabe[4]
[1]Physics Department, University of Texas at El Paso, TX
[2]Valley Research Corporation, Austin, TX
[3]University of Illinois at Urbana, IL
[4]INSPI University of Florida at Gainesville, FL

Monday Morning, June 1, 1992
Poster Session 1P18-21: Gaseous Electronics

1P18 **Langmuir Probe and Optical Diagnostics of an Inductively-Coupled RF Plasma**

D.S. McDonald, D. Bachman, P. Chen, C.Y. Li, A.T. Young and K.N. Leung
Lawrence Berkeley Laboratory, Berkeley, CA

1P19 **Simulating Oxygen RF Discharges with a Kinetic PIC-MCC Code**

V. Vahedi,[1] M.A. Lieberman,[1] G. DiPeso,[1] C.K. Birdsall,[1] T.D. Rognlien,[2] J.R. Hiskes[2] and R.H. Cohen[2]
[1]University of California, Berkeley, CA
[2]Lawrence Livermore National Laboratory, Livermore, CA

1P20 **Effects of Secondary Electron Emission on DC Plasma Source Sheaths**

C. Ordonez,[1] R. Carrera,[2] R. Mohanti[3] and E. Montalvo[2]
[1]Physics Department, University of Texas at El Paso, TX
[2]Valley Research Corporation, Austin, TX
[3]JET Joint Undertaking, Abingdon, UK

1P21 **A Hybrid Hydrodynamic-Monte Carlo Simulation of the Transport of Neutral Radicals in Low Pressure Remote Plasma Sources**

M.J. Hartig and M.J. Kushner
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

Monday, 1 June 1992

2:00 p.m. - Ballroom B/C

PSAC Prize Address

"Light Ion Beam Transport"

presented by

Paul F. Ottinger
Plasma Physics Division
Naval Research Laboratory

Chairperson: Frank J. Young

Monday, 1 June 1992
3:00 p.m. - Ballroom D
Oral Session 2A: Intense Electron and Ion Beams
Session Chairperson: Jesse Neri

2A1-2 Invited

SABRE (Sandia Accelerator and Beam Research Experiment): A Test Bed for the Light Ion Fusion Program

M.E. Cuneo, D.L. Hanson, P.F. McKay, J.E. Maenchen, G.C. Tisone, R.G. Adams, T. Nash, M. Bernard, C. Boney, J.R. Chavez, W.F. Fowler, J. Ruscetti, W.F. Sterns, D. Noack, D.F. Wenger
Sandia National Laboratories, Albuquerque, NM

2A3 **Divergence Measurements of the Beams from an Applied B Ion Diode on PBFA II**

D.J. Johnson, J.E. Bailey, T.A. Haill and D.F. Wenger
Sandia National Laboratories, Albuquerque, NM

2A4 **LEVIS Lithium Ion Source Experiments on PBFA-II**

T.J. Renk, G.C. Tisone, R.G. Adams, M. Lopez, B.F. Clark, J. Schroeder, J.E. Bailey, A.B. Filuk and A.L. Carlson
Sandia National Laboratories, Albuquerque, NM

2A5 **Electron Dynamics in High-Power Extended Planar-Anode Diodes Terminating MITL's on Hermes III**

T.W.L. Sanford, J.W. Poukey, J.A. Halbleib and R.C. Mock
Sandia National Laboratories, Albuquerque, NM

2A6 **A New Linear Induction Voltage Adder Approach to Radiography**

M.G. Mazarakis,[1] J.W. Poukey,[1] C.A. Frost,[1] D.L. Johnson,[1] S.L. Shope,[1] J.A. Halbleib,[1] K.R. Prestwich,[1] B.N. Turman[1] and I. Smith[2]
[1]Sandia National Laboratories, Albuquerque, NM
[2]Pulsed Sciences Incorporated, San Leandro, CA

2A7 **Post Acceleration of a Pseudospark-Produced Electron Beam by an Induction Linac**

B.N. Ding, T.J. Myers and M.J. Rhee
Laboratory for Plasma Research and Electrical Engineering Department, University of Maryland, College Park, MD

2A8 **Comparative Analysis of Fluence Diagnostics for High-Dose Proton Beams**

S.H. Richter
Ktech Corporation, Albuquerque, NM

Oral Session 2A: Intense Electron and Ion Beams (continued)

2A9 Chaoticity in the Electron Orbits in a Free Electron Laser

L. Michel-Lours[1], A. Bourdier[2], J.M. Buzzi[1]
[1]Laboratoire de Physique des Mileux Ionises, Ecole Polytech. Palaiseau, Villeneuve-St-Georges, France
[2]Also associated with Centre'Etudes De Limeil-Valenton, Villeneuve-St-Georges, France

Monday, 1 June 1992
3:00 p.m. - Ballroom E
Oral Session 2B: Microwave Plasma Interactions
Session Chairperson: Igor Alexeff

2B1 **Reflection and Transmission of Electromagnetic Waves by a Suddenly Created Plasma Slab**

D.K. Kalluri
Department of Electrical Engineering, University of Massachusetts, Lowell, MA

2B2 **Frequency-Shifting with Power Amplification**

D.K. Kalluri and S.R.V. Madala
Department of Electrical Engineering, University of Massachusetts, Lowell, MA

2B3 **A Plasma Filled Tunable Notch Absorber Microwave Filter**

M. Laroussi
Plasma Science Laboratory, University of Tennessee, Knoxville, TN

2B4-5 Invited

Theory and Experiments on Frequency Upshifting Microwaves by Relativistic Ionization Fronts

W.B. Mori
Department of Electrical Engineering and Physics, University of California at Los Angeles, CA

2B6 **Two-Dimensional Computer Calculation of High-Power Microwave Bandwidth Broadening by Air Breakdown in a Rectangular Waveguide**

D.J. Mayhall and J.H. Yee
Lawrence Livermore National Laboratory, Livermore, CA

2B7 **Frequency Up-Conversion of Microwave Radiation by Interaction with a Rapidly Created Plasma**

S.P. Kuo and A. Ren
Weber Research Institute, Polytechnic University, Farmingdale, NY

2B8 **Study of Wave Propagation through a Fast Growing Plasma Slab**

A. Ren, J. Huang and S.P. Kuo
Weber Research Institute, Polytechnic University, Farmingdale, NY

2B9 **Analysis of Electromagnetic Scattering off a Two Dimensional Periodic Plasma Structure by the Quasiparticle Method**

A.Y. Ho and S.P. Kuo
Weber Research Institute, Polytechnic University, Farmingdale, NY

Monday, 1 June 1992
3:00 p.m. - Ballroom F
Oral Session 2C: Solid State Plasmas and Switches
Session Chairperson: Mike Stroscio

2C1 **Current Filamentation in GaAs Photoconductive Switches**

J.C. Adams, R.A. Falk and C.D. Capps
Boeing Defense & Space Group, Seattle, WA

2C2 **The Temporal Development of Electric Field Inhomogeneities in Photoconductive GaAs Switches at Low Light Activation**

K. H. Schoenbach, J.S. Kenney, and R.J. Allen
Physical Electronics Research Institute, Old Dominion University, Norfolk, VA

2C3-4 **Invited**

De Rerum Plasma Constricta

Alan Garscadden
Wright Laboratory, Wright-Patterson Air Force Base, Ohio

2C5 **Photoconductive Power Switching Using Polycrystalline and Single Crystal ZnSe**

P.S. Cho, P.-T. Ho, J. Goldhar and C.H. Lee
Department of Electrical Engineering, University of Maryland,
College Park, MD

2C6 **Dielectric Surface Breakdown of High Purity Silicon**

D.M. Abner and B.N. Ganguly
Wright Laboratory, WPAFB, OH

2C7-8 **Invited**

Transport Stability During Transient High-Power-Density Operation of the Bulk Photoconductive Switch

M.S. Mazzola,[1] R. Korzekwa[1] and R.P. Brinkmann[2]
[1]Naval Surface Warfare Center, Pulsed Power Technology Branch,
Dahlgren, VA
[2]Physical Electronics Research Institute, Old Dominion University,
Norfolk, VA

Oral Session 2C: Solid State Plasmas and Switches (continued)

2C9 Reduction of Carrier--Interface-Phonon Scattering Near Metal-Semiconductor Interfaces for Phonon Frequencies Below the Plasmon Frequency

M.A. Stroscio,[1] G.J. Iafrate,[1] K.W. Kim,[2] A. Bhatt,[2] M. Dutta[3] and H.L. Grubin[4]
[1]U.S. Army Research Office, Research Triangle Park, NC
[2]Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC
[3]U.S. Army Electronics Technology and Devices Laboratory, Fort Monmouth, NJ
[4]Scientific Research Associates, Inc., Glastonbury, CT

Monday Afternoon, 1 June 1992
Poster session 2P1-10: Basic Phenomena and Plasma Waves and Space Plasmas Diagnostics and Models

2P1 **Interaction of a Weakly-Nonlinear Laser Pulse with a Plasma**
H.H. Kuehl, C.Y. Zhang and T. Katsouleas
Department of Electrical Engineering, University of Southern California, L.A., CA

2P2 **A Reflector Antenna for Electron Plasma Waves**
Y. Morita, R. Kurati and S. Egashira
Saga University, Saga, Japan

2P3 **Variational Theory of Cyclotron Emission from Nonuniformly Magnetized Plasmas**
V.F. Shvets and D.G. Swanson
Physics Department, Auburn University, AL

2P4 **An Exact Solution of the Relativistic Equation of Motion of a Charged Particle Driven by an Elliptically Polarized Electromagnetic Wave**
S. Acharya and A.C. Saxena
Neutron Physics Division, Bhabha Atomic Research Centre, Bombay, India

2P5 **Self-Oscillations in the Weakly Ionized Energy Absorbed Substance**
O.V. Kudrevatova[1] and A.V. Tatarinov[2]
[1]Institute of Science and Research, Moscow, Russia
[2]Moscow, Russia

2P6 **New Mechanisms of Resonant Absorption of Electromagnetic Waves in a Magnetized Plasma**
S.P. Karnilovich and V.P. Milantiev
Dept. of Experimental Physics, Patrice Lumumba University, Moscow, Russia

2P7 **Radiation Field Patterns from Particle Beam Antennas in Space**
T. Ohnuma and M. Shimegi
Department of Electrical Engineering, Tohoku University, Sendai, Japan

2P8 **Enhanced Luminosity during Electron Beam Emission from the SCEX-1 Rocket**
S.T. Lai
Phillips Laboratory, Hanscom AFB, MA

Poster Session 2P1-10: Basic Plasma Phenomena and Plasma Waves and Space Plasmas Diagnostics and Models (continued)

2P9 **Triple-Root Jump in Spacecraft Potential due to Electron Beam Emission or Impact**

S.T. Lai
Phillips Laboratory, Hanscom AFB, MA

2P10 **New Type of Surface Waves in Magnetoactive Plasma Waveguide**

N. A. Azarenkov, K.N. Ostrikov
Kharkov State University, Kharkov, USSR

2P11 **Study of the Electron Gas Behavior in an ECR Multipolar Plasma Source**

P. Mak, W. Tan, F.C. Sze, T.A. Grotjohn and J. Asmussen
Department of Electrical Engineering, Michigan State University, East Lansing, MI

2P12 **Performance Measurements for an MBE-ECR Plasma and Free Radical Source**

A.K. Srivastava and J. Asmussen
Department of Electrical Engineering, Michigan State University, East Lansing, MI

2P13 **Onset of Breakdown and Formation of Cathode Spots**

F. Schwirzke, M.P. Hallal, Jr. and X.K. Maruyama
Naval Post Graduate School, Monterey, CA

2P14 **Plasma Guns for the Generation of Pulsed Metal Plasma Streams**

X. Yao, A. Anders, S. Anders, I.G. Brown, M.R. Dickinson and R.A. MacGill
Lawrence Berkeley Laboratory, University of California, Berkeley, CA

2P15 **Vacuum Arc Application for Generation of Plasma and Ion Beams**

E.M. Oks and George Yu. Yushkov
High Current Electronics Institute of the Russian Academy of Sciences, Siberia Division, Tomsk, Russia

2P16 **Generation of a High-Current Hollow Electron Beam in a Plasma Cathode Source**

A.A. Chagin and E.M. Oks
High Current Electronics Institute of the Russian Academy of Sciences, Siberian Division, Tomsk, Russia

2P17 **Laser Produced Plasma Sources for Pulsed Light Ion Diodes**

K. Kasuya,[1] K. Horioka,[1] T. Hushiki,[1] Matsuura,[1] T. Miyoshi,[1] H. Hayase,[1]
K. Nakata,[2] Y. Miyai,[2] Y. Kawakita[2] and E. Ohshita[2]
[1]Department of Energy Sciences, The Graduate School at Nagatsuta, Tokyo Institute of Technology, Japan
[2]High-Voltage R & D Division, Nissin Electric Company, Kyoto, Japan

Poster session 2P11-24: Electron, Ion and Plasma Sources (continued)

2P18 **High Brightness K+ Ion Source for Heavy Ion Fusion Linear Induction Accelerators.**

E. Henestroza, S. Eylon, W. Chupp, H. Rutkowski
Lawrence Berkeley Laboratory, Berkeley, CA

2P19 **Microwave-Generated NO_x Production in Air Breakdown**

K.-M. Jeong,[1] D.E. Hunton[1] and S.P. Kuo[2]
[1]Geophysics Directorate, Phillips Laboratory (AFSC), Hanscom AFB, Bedford, MA
[2]Department of Electrical Engineering and Computer Science, Polytechnic University

2P20 **Mechanical Variation of Plasma Potential, Electron Temperature and Plasma Density in a Multi-dipole RF Glow Discharge**

N. Hershkowitz
Department of Nuclear Engineering & Engineering Physics, University of Wisconsin, and Engineering Research Center for Plasma-Aided Manufacturing, Madison, WI

2P21 **A Compact High Current "Hief-Source" for RFQ Injection**

K. Volk,[1] T. Ludwig,[1] H. Klein[1] and K.N. Leung[2]
[1]Institut für Angewandte Physik, Universität Frankfurt, Frankfurt, Germany
[2]Lawrence Berkeley Laboratory, University of California, Berkeley, CA

2P22 **RF Driven Multicusp Source for Postive and Negative Ion Beam Production**

K. N. Leung, D.A. Bachman and D.S. McDonald
Lawrence Berkeley, Laboratory, University of California, Berkeley, CA

2P23 **Time-Resolved Energy Spectrum of a Pseudospark-Produced High-Brightness Electron Beam**

T.J. Myers, B.N. Ding and M.J. Rhee
Laboratory for Plasma Research and Department of Electrical Engineering, University of Maryland, College Park, MD

2P24 **Nuclear Plasma Source for Space Propulsion**

Y. Watanabe,[1] R. Carrera,[2] E. Montalvo,[2] T. Parish[3] and T. Tajima[4]
[1]INSPI, University of Florida at Gainesville, FL
[2]Valley Research Corporation, Austin, TX
[3]Nuclear Engineering Department, Texas A&M University, TX
[4]IFS, University of Texas at Austin, TX

Monday Afternoon, 1 June 1992
Poster Session 2P25-27: Environmental/Energy Issues in Plasma Science

2P25 Plasma Processing of Hazardous Materials

W.D. Booth,[1] J. Brock,[2] R. Carrera,[1] J. Gallmeir,[1] E. Montalvo,[1] M. Oakes[3] and L. Pekker[4]
[1]Valley Research Corporation, Austin, TX
[2]Chemical Engineering Department, University of Texas at Austin, TX
[3]Physics Department, University of Texas at Austin, TX
[4]Electrical Engineering Department, University of Minnesota, MN

2P26 Development of Ecologically Clean Methods for Plasma and Membrane Processing Reduction Gases in Metallurgy

V. Frolov, A. Pukov, M. Tseitlin, A. Gurianov, A. Andreev, N. Lyakishev[1], Yu. Tsvetkov, V. Rusanov[2], N. Urvachev, M. Krotov, G. Korkishko[3], G. Nozdrenko[4], N. Zhuravel[5]
[1]The Tulachermet Incorporated Company, Ltd., Tula, Russia
[2]The Metallurgy Institute after A.Baykov, Moscow, Russia
[3]Kurchatov Institute of Atomic Energy, Moscow, Russia
[4]Novosibirsk Electrotechnical Institute, Novosibirsk, Russia
[5]Siberian Branch as Institute of Economics, Novosibirsk, Russia

2P27 Numerical Simulation of Advanced RF Plasma Sources

E. Montalvo[1], R. Carrera, M. Lebrun[2], and L.Pekker[3]
[1]Valley Research Corporation, Austin, Texas
[2]IFS, University of Texas at Austin, Austin, Texas
[3]Department of Electrical Engineering, University of Minnesota

Tuesday, 2 June 1992

8:30 a.m. - Ballroom B/C

"Progress in Magnetic Fusion Research"

presented by

Ronald Davidson

Plasma Physics Laboratory
Princeton University

Chairperson: Mary Ann Sweeney

Tuesday, 2 June 1992
9:45 a.m. - Ballroom D
Oral Session 3A: Vacuum Electronics
Session Chairperson: Robert Parker

3A1 **Numerical Simulation of One-Dimensional Quantum Transport**

A.K. Ganguly and K.L. Jensen
Naval Research Laboratory, Washington, D.C.

3A2 **Experimental and Theoretical Investigations of Gated Field Emitter Failures**

J. Browning, N. McGruer, S. Meassick, C. Chan, W. Bintz and M. Gilmore
Electrical and Computer Engineering Department, Northeastern University, Boston, MA

3A3-4 Invited

Design Considerations for the Testing and Operation of Field Emitter Array Cathodes in a Resonant Triode Configuration

J.P. Calame,[1] J.L. Shaw,[1] H.F. Gray[1] and P.M. Phillips[2]
[1]Vacuum Electronics Branch, Naval Research Laboratory, Washington, DC
[2]Science Applications International Corp., McLean, VA

3A5 **Efficiency Measurement for a Three-Cavity Gyroklystron Amplifier**

G.S. Park, P.M. Malouf, V.L. Granatstein[1], C.M. Armstrong,
and A.K. Ganguly[2]
[1]Omega-P, Inc., New Haven, CT 06520
[2]Naval Research Laboratory, Washington, D.C.

3A6 **Mode Competition in Gyro-Peniotron Amplifier**

A.K. Ganguly and S. Ahn
Naval Research Laboratory, Washington, D.C.

3A7 **A Critical Re-Examination of AC Space Charge Effects in Beam-Circuit Interactions**

D. Chernin[1] and Y.Y. Lau[2]
[1]Science Applications International Corp., McLean, VA
[2]Naval Research Laboratory, Washington, DC

3A8 **Theoretical and Experimental Progress in Dielectric and Grating Cerenkov Masers with Pencil or Sheet Beams**

J. Booske, J.E. Scharer, B.D. McVey,* J. Joe and S.F. Chang
Electrical and Computer Engineering Department, University of Wisconsin, Madison, WI
*On Sabbatical from Los Alamos National Laboratory, Los Alamos, NM

Oral session 3A: Vacuum Electronics (continued)

3A9 Crossed-Field Amplifier Experiments With In Situ Diagnostic Probe Measurements

J. Browning,[1] C. Chan,[1] J. Ye,[1] R. MacGregor,[1] J. Talbot,[1] S. Meassick,[1]
T.E. Ruden[2] and G.E. Dombrowski[3]
[1]Electrical and Computer Engineering Department, Northeastern University, Boston, MA
[2]Raytheon Co., Tewksbury, MA
[3]Storrs, CN

Tuesday, 2 June 1992
9:45a.m. - Ballroom E
Oral Session 3B: Computational Plasma Science
Session Chairperson: Jeffrey P. Quintenz

3B1 **Computational Aspects of the Vacuum/Plasma Interface in Low Alfven-Mach Number MHD Simulations**

M.H. Frese
NumerEx, Albuquerque, NM

3B2 **Calculation of the Electron Energy Distribution Function in Electron Cyclotron Resonance Etching Plasmas**

M. Hussein, G.A. Emmert and N. Hershkowitz
Engineering Research Center for Plasma-Aided Manufacturing, University of Wisconsin, Madison, WI

3B3 **Analysis of the Electromagnetic Excitation of the Discharge in an ECR Multipolar Plasma Source**

W. Tan, P. Mak and T.A. Grotjohn
Department of Engineering, Michigan State University, East Lansing, MI

3B4 **Finite Element Induction Plasma Modelling**

M.R. Mekideche and M. Feliachi
L.R.T.I. - I.U.T., Saint Nazaire, France

3B5 **A Generalized Thermodynamic Model of SF6 Including Analytical Pressure Dependence**

P. Scarpa, B. Dauby and W. Legros
Department of Electrical Engineering, University of Liège, Belgium

3B6-7 <u>Invited</u>

A Numerical Laboratory for Kinetic Plasma Simulation with Application to η_i Mode Turbulence and Transport in a Tokamak-Like Plasma

M.J. Lebrun, M. Gray, T. Tajima, G. Furnish, Y. Kishimoto, W. Horton
Institute for Fusion Studies, University of Texas at Austin, Austin, TX

Tuesday, 2 June 1992
9:45 a.m. - Ballroom F
Oral Session 3C: Basic Plasma Phenomena and Plasma Waves
and
Space Plasmas Diagnostics and Models
Session Chairperson: Chung Chan

3C1-2 **Invited**

Small-scale Structure of the Auroral Electron and Ion Acceleration Mechanisms

R.L. Arnoldy
Space Science Center, University of New Hampshire, Durham, NH

3C3 **The Spacecraft as a Langmuir Plasma Probe**

S.T. Lai
Phillips Laboratory, Hanscom AFB, MA

3C4 **Ion Collection in a Spacecraft Wake-Laboratory and Numerical Simulations**

S. Meassick, C. Chan[1], C.I. Enloe, and D. Cook[2]
[1]Department of Electrical and Computer Engineering, Northeastern University, Boston, MA
[2]Phillips Laboratory, Hanscom AFB, MA

3C5 **Single Ion Motion in a Reversed Field Structure**

M. B. Silevitch[1], P.L. Rothwell[2], L.P. Block, and C-G. Falthammar[3]
[1]Center for Electromagnetics Research, Northeastern University, Boston, MA
[2]Space Physics Division, Geophysics Directorate, Hanscomb AFB, Bedford, MA
[3]Department of Plasma Physics, The Royal Institute of Technology, Stockholm, Sweden

3C6-7 **Invited**

Laboratory Modelling of Magnetospheric Phenomena

N. Rynn and R. McWilliams
Department of Physics, University of California, Irvine, CA

3C8 **Propagation Characteristics of Ordinary Waves in Plasmas Having Loss-Cone Electron Velocity Distributions**

A.C. Saxena
Neutron Physics Division, Bhabha Atomic Research Centre, Bombay, India

Oral Session 3C: Basic Plasma Phenomena and Plasma Waves and Space Plasmas Diagnostics and Models (continued)

3C9 **A Mechanism Responsible for the Observation of Symmetric Lower Hybrid Sidebands and a Lower Frequency Mode in the Upper Ionosphere**

Y.R. Dalkir,[1] M.C. Lee,[1] K.M. Groves[1] and S.P. Kuo[2]
[1]Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA
[2]Weber Research Institute, Polytechnic University, Farmingdale, NY

3C10-11 **Invited Talk**

Modeling Ion Conics in Space

T. Chang
Center for Space Research, Massachusetts Institute of Technology, Cambridge, MA

Tuesday Morning, 2 June 1992
Poster Session 3P1-9: Plasma Focus

3P1 **$^{12}C+D$, $^{14}N+D$, $^{12}C+{}^{3}He$ and $^{14}N+{}^{3}He$ Nuclear Reactions in the Plasma Focus Pinch**

J.S. Brzosko, V. Nardi and C. Powell
Stevens Institute of Technology, Hoboken, NJ

3P2 **Physical Processes in the Intermediate-Layer Plasma-Vapor-Metal at Moment of MA-Current Cumulation on Axis of the DPF-Discharge**

N.V. Filippov, H.O. Baronova and T.I. Filippova
I.V. Kurchatov Institute of Atomic Energy, Moscow, Russia

3P3 **Investigation of Micropinches in the DPF78 Plasma Focus**

H. Schmidt and D. Schulz
Istitut Für Plasmaforschung, Universität Stuttgart, Germany

3P4 **Particle Emission on Staged (ns and us) Time Scales From Focused Discharges**

C. Powell, V. Nardi and J. Wang
Stevens Institute of Technology, Hoboken, NJ

3P5 **The DPF Turbulance Investigation**

V. A. Gribkov
P.N. Lebedev Phys. Inst., The Russian Academy of Sciences, Moscow, Russia

3P6 **Parametric Studies of Electrode Configurations for the Dense Plasma Force**

G.T. Nakafuji,[1] C.K. Choi[1] and G.H. Miley[2]
[1]School of Nuclear Engineering, Purdue University, West Lafayette, IN
[2]Nuclear Engineering Laboratory, University of Illinois, Urbana, IL

3P7 **Hypocycloidal Pinch (HCP) Light Source for Tm^{+3}:YLF Excitation**

B.R. Kim, K.S. Han and J.H. Lee
Department of Physics, Hampton University, Hampton, VA

3P8 **Gated Soft X-ray Images from A Plasma Focus Device**

C.K. Yeh, C.C. Tzeng, Y.J. Yu, Y.Y. Kuo, M. Wen, W.S. Hou and T.R. Yeh
Institute of Nuclear Energy Research, Lungtan, Taiwan

3P9 **Application of Pulse Power Technology to ICF-Focusing and Propagation of Proton Beam**

K. Niu
Institute of Physical and Chemical Research, Teikyo University of Technology, Japan

Tuesday Morning, 2 June 1992
Poster Session 3P10-26: Intense Beam Microwave Generation

3P10 **Theoretical and Experimental Investigations of Cyclotron Interaction Effect on Relativistic Backward Wave Oscillator Operation**

A. Vlasov,[1] B. Levush,[2] A. Bromborsky,[3] S. Miller,[2] G.S. Nusinovich,[2]
Y. Carmel,[2] W.R. Lou,[2] D. Abe,[2] W.W. Drestler[2] and V.L. Granatstein[2]
[1]University of Moscow, Moscow, Russia
[2]Laboratory for Plasma Research, University of Maryland, College Park, MD
[3]Harry Diamond Laboratories, Adelphi, MD

3P11 **An Experimental Study of the Effects of Structure Length on Relativistic Backward Wave Oscillator Properties**

G. Barreto,[1] J.M. Butler[2] and C.B. Wharton[1]
[1]Laboratory of Plasma Studies, Cornell University, Ithaca, NY
[2]Hughes Research Laboratories, Malibu, CA

3P12 **Repetitive Operation of a Relativistic Klystron Amplifier**

J.S. Levine, N.J. Cooksey and B.D. Harteneck
Physics International Company, San Leandro, CA

3P13 **Simulation Studies of Relativistic Klystron Amplifier**

H.C. Chen, R.A. Stark and V.M. Ayres
Naval Surface Warfare Center, White Oak, Silver Spring, MD

3P14 **The Relativistic Klystron Amplifier Experiment**

S.Z. Fu, P.S. Wang, Y.T. Chen and K.S. Hu
Institute of Applied Electronics, China Academy of Engineering Physics, Sichuan, China

3P15 **Linear and Nonlinear Analysis of the Double Stream Cyclotron Maser**

A.K. Ram, C. Chen, A. Bers, W. Hu and G. Bekefi
Plasma Fusion Center, Research Laboratory of Electronics and Department of Physics, Massachusetts Institute of Technology, Cambridge, MA

Poster Session 3P10-26: Intense Beam Microwave Generation (continued)

3P16 **Gyrotron-Backward-Wave-Oscillators Driven by a Microsecond Electron Beam Accelerator**

R.M. Gilgenbach,[1] T.A. Spencer,[2] P.R. Menge[1] and M.T. Walter,[1]
[1]Intense Energy Beam Interaction Laboratory, Nuclear Engineering Department, University of Michigan, Ann Arbor, MI
[2]Phillips Laboratory, Kirtland AFB, NM

3P17 **High Power X-Band Magnicon Amplifier Experiment**

S.H. Gold,[1] C.A. Sullivan,[1] B. Hafizi,[2] W.M. Manheimer[1] and P. Sprangle[1]
[1]Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C.
[2]Icarus Research, Bethesda, MD

3P18 **Analysis and Simulation of a Magnicon Deflection System**

B. Hafizi,[1] S.H. Gold,[2] W.M. Manheimer[2] and P. Sprangle[2]
[1]Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C.
[2]Icarus Research, Bethesda, MD

3P19 **Relativistic Theory of Current Drive by Radio Frequency Waves in a Magnetized Plasma**

T. P. Khan
Dept.of Physics, Dinabandhu Andrews College, Calcutta, India

3P20 **The Split Cavity Oscillator and RF Extraction**

R.W. Lemke, M.C. Clark and B.M. Marder
Sandia National Laboratories, Albuquerque, NM

3P21 **Polarization of Microwave Radiation from the Axial Vircator with a Step Waveguide**

M.W. Wu, T.C. Guung and C.S. Hwang
Institute of Nuclear Energy Research, Lungtan, Taiwan

3P22 **Theoretical Investigation of Two-Frequency Generation Mechanism in Vircator**

V.P. Grigoryev, M.Yu. Antoshkin, T.V. Koval, and N.I. Sablin
Institute of Nuclear Physics, Tomsk, Russia

3P23 **Investigation of High-Frequency Discharge in Humid Air**

V.P. Grigoryev, Zh.K. Beysembaev, and A.G. Potashev
Institute of Nuclear Physics, Tomsk, Russia

Poster Session 3P10-26: Intense Beam Microwave Generation (continued)

3P24 **Relativistic Magnetron Simulation: Transition from Synchronous to Non-Synchronous Negative Resistance Regime**

T.E. Ruden[1] and G.E. Dombrowski[2]
[1]Missile Systems Division, Raytheon Company, Tewksbury, MA
[2]Storrs, CT
*Place with High-Power magnetron crossed field papers.

3P25 **Multi-GHz Bandpass, High-Repetition Rate Single Channel Mobile Diagnostic System for Ultra-Wideband Applications**

L.M. Miner[1] and D.E. Voss[2]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Voss Scientific, Albuquerque, NM

3P26 **Dielectric Cherenkov Maser as a Powerful Amplifier with Superwide Bandwidth**

A.S. Shlapakovskii and K.A. Chirko
Institute of Nuclear Physics of Tomsk Polytechnical Institute

Tuesday Morning, 2 June 1992
Poster Session 3P27-33: Plasma Diagnostics

3P27 **A New Pitch-Angle Diagnostic for Magnetized Plasmas**

S.W. Lam and N. Hershkowitz
Engineering Research Center, University of Wisconsin, Madison, WI

3P28 **Potential Well Measurements in Spherical Electrostatic-Inertial Plasma Confinement (SEIC) Using a Collimated Proton Detector**

G.H. Miley, J.H. Nadler and Y.B. Gu
Fusion Studies Laboratory, University of Illinois, Urbana, IL

3P29 **Beam Brightness Calculation for Analytical and Empirical Distribution Functions**

T.J. Myers, K.A. Boulais, Y.S. O and M.J. Rhee
Department of Electrical Engineering and Laboratory for Plasma Research, University of Maryland, College Park, MD

3P30 **Time Resolved Mass Flow Measurements for a Fast Gas Delivery System**

E.L. Ruden,[1] J.H. Degnan,[1] T.W. Hussey,[1] M.C. Scott,[2] J.D. Graham[2] and S.K. Coffey[3]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Maxwell Laboratories, Inc., Albuquerque, NM
[3]Physical Sciences, Inc., Alexandria, VA

3P31 **Measurements of the Plasma Potential Profile and Density Fluctuations on the ATF Torsatron using a Heavy Ion Beam Probe**

J.J. Zielinski,[1] S.C. Aceto,[1] J.G. Schwelberger,[1] K.A. Connor,[1] J.F. Lewis,[1] A. Carnevali,[2] J.C. Glowienka,[3] H. Iguchi,[4] I.S. Nedzelskij[5] and T. Uckan[3]
[1]Rensselar Polytechnic Institute, Troy, NY
[2]Randolf-Macon Woman's College, Lynchberg, VA
[3]Oak Ridge National Laboratory, Oak Ridge, TN
[4]National Institute for Fusion Science, Nagoya, Japan
[5]Kharkov Inst. of Physics and Technology, Kharkov, Ukraine

3P32 **The Fibre-Optical Measuring Means for the Apparatus of the Superhigh Frequency Band**

A.N. Gusev, O.V. Kudrevatova, B.M. Milinkis and A.I. Sinany
Moscow Institute of the Radiotechnics, Electronics and Automatics, Moscow, Russia

3P33 **Investigation of Collisional Processes in a Laser Produced Plasma**

V.S. Burakov, N.V. Tarasenko, N.A. Cheptsova and B.I. Stepanov
Institute of Physics, Minsk, Byelarus

Tuesday Morning, 2 June 1992
Poster Session 3P34-37: Magnetohydrodynamics

3P34 **Explosively-Driven MHD Generator with Regenerative Magnetic Field**

R.K. Albano and J.L. Morrison
Idaho National Engineering Laboratory, Idaho Falls, ID

3P35 **Current-Carrying Plasma and the Magnetic Field Ambiguity in Classical MHD Theory**

N.A. Salingaros[1] and R. Carrera[2]
[1]Southern Methodist University and the University of North Texas, Dallas, TX
[2]Valley Research Corporation, Austin, TX

3P36 **Development of Lyapunov Direct Method in the Theory and Mathematical Modeling of Plasma Stability**

V.M.Matrosov, D.N. Zayzev, Y.A. Markov, G.A. Rudykh, E.I. Semenov, N.A. Sidorov, A.V. Sinitsyn, D.A. Tolstonogov
Irkutsk Computing Center, Irkutsk, Russia

3P37 **Analysis of the Plasma Magnetohydrodynamic Equilibrium in Iron Core Transformer Tokamak HL-1M**

X. Chen and B. Yuan
Southwestern Institute of Physics, Chengdu, China

Tuesday, 2 June 1992

2:00 p.m. - Ballroom B/C

"French Activity in High Power Free Electron Lasers"

presented by

Henri Doucet
Direction des Applications Militaires
Commisariat l'Energie Atomique

Chairperson: H. H. Kuehl

Tuesday, 2 June 1992
3:00 p.m. - Ballroom D
Oral Session 4A: Plasma Focus
Session Chairperson: Jan S. Brzosko

4A1-2 Invited

Hot Spots, Ion Clusters and the Fine Structure of Focused Discharge Pinches

V. Nardi
Stevens Institute of Technology, Hoboken, NJ

4A3 **Micropinches in the SPEED 2 Plasma Focus**

G. Decker, W. Kies, M. Mälzig and P. Röwekamp
Institute für Experimentalphysik, Heinrich-Heine-Universität Düsseldorf, FRG

4A4 **Conservation of Fusion Reaction Optimum Yield in Focused Discharges with Variable Voltage and Energy but Constant Geometry**

L. Bilbao, A. Bortolotti, J. Brzosko, P. DeChiara, H. Kilic, F. Mezzetti,
V. Nardi, C. Powell, J. Wang
Stevens Institute of Technology, Hoboken, NJ
Cooperative Research Program, University of Ferrara

4A5 **High-Current Plasma-Focus Research**

B.L. Freeman, K.D. Sowder and D.T. Torres
Los Alamos National Laboratory, Los Alamos, NM

4A6 **Dense Plasma Focus X-Ray Source for Lithography**

R.R. Prasad,[1] M. Krishnan,[1] J. Mangano,[1] P. Burkhalter[2] and J. Maldonado[3]
[1]Science Research Laboratory, Alameda, CA
[2]NRL
[3]IBM/GTD

4A7 **Optimization of a Cylindrical Pinch**

L. Bilbao, G. Garcia
Laboratorio de Fisica del Plasma, FCEN, University of Buenos Aires, Argentina

4A8 **Magnetohydrodynamic Numerical Simulation of Imploding Hollow Cylindrical Plasma**

D.S. Han and T.C. Yang
Department of Electrical Engineering, Tsing Hau University, Beijing, China

4A9 **A Solid Target Design for the Dense Plasma Focus**

G.H. Miley and J. Javedani
Fusion Studies Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL

Oral Session 4A: Plasma Focus (continued)

4A10 Compact Toroid Formation, Compression, and Acceleration

J.H. Degnan,[1] D.E. Bell,[1] G.P. Baca,[1] M.E. Dearborn,[1] M.R. Douglas,[1]
S.E. Englert,[1] T.J. Englert,[1] J.H. Holmes,[1] T.W. Hussey,[1] G.F. Kiuttu,[1]
F.M. Lehr,[1] G.J. Marklin,[1] B.W. Mullins,[1] R.E. Peterkin,[1] D.W. Price,[1]
N.F. Roderick,[1] E.L. Ruden,[1] P.J. Turchi,[1] D. Gale,[2] J.D. Graham,[2] M. Scott,[2]
W. Sommars,[2] S.K. Coffey,[3] S.W. Seiler,[3] and G. Bird,[3]
[1]High Energy Plasma Division, Phillips Laboratory, Kirtland, AFB, NM
[2]Maxwell Laboratories, Inc., Albuquerque, NM
[3]Physical Sciences, Inc., Alexandria, VA

Tuesday, 2 June 1992
3:00 p.m. - Ballroom E
Oral Session 4B: Intense Beam Microwave Generation
Session Chairperson: Dr. Steven H. Gold

4B1 **From Linearity Towards Chaos: Basic Studies of Relativistic Backward Wave Ocillators**

Y. Carmel,[1] B. Levush,[1] W. Lou,[1] J. Rodgers,[1] A. Bromborsky,[2]
T. Antonsen,Jr.,[1] W.W. Destler[1] and V.L. Granatstein[1]
[1]Laboratory for Plasma Research, University of Maryland, College Park, MD
[2]Harry Diamond Laboratories, Adelphi, MD

4B2 **A Nonlinear Theory of Energy and Current Modulation in a Relativistic Klystron Amplifier**

H.S. Uhm
Naval Surface Warfare Center, White Oak, Silver Spring, MD

4B3 **A Theoretical Model of an Electron Beam Coupling with Cavities in a Klystron Amplifier**

H.S. Uhm
Naval Surface Warfare Center, White Oak, Silver Spring, MD

4B4 **New Mechanism of Electron Phase Bunching Arising From the Nonuniform Magnetic Field**

J.S. Yu[1] and B. Lu[2]
[1]Southwestern Institute of Physics, Chengdu, China
[2]High Energy Microwave Electronics Institute, University of Electronic Science and Technology, Chengdu, China

4B5-6 Invited

Applications of High Power Microwaves

J. Benford[1] and J. Swegle[2]
[1]Physics International Company, San Leandro, CA
[2]Lawrence Livermore National Laboratory, Livermore, CA

4B7-8 Invited

Recent Advances in the Development of the Relativistic Klystron Amplifier

V. Serlin and M. Friedman
Plasma Physics Division, Naval Research Laboratory, Washington, DC

Tuesday Afternoon, 2 June 1992
Poster Session 4P1-2: Computational Plasma Science

4P1 **The Numerical Analysis of Transient Time and Conditions of RMF Current Drive**

J. Lin,[1] Y. Terai,[1] M. Suzuki,[1] E. Hotta[1] and I. Hayashi[2]
[1]Tokyo Institute of Technology, Tokyo, Japan
[2]University of Electro-Communications, Tokyo, Japan

4P2 **Minimum-Energy State of an Axi-Symmetric Toroidal Plasma**

M. Suzuki, M. Saito and E. Hotta
Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan

Tuesday Afternoon, 2 June 1992
Poster Session 4P3-11: Electrical Gas Discharges

4P3 **Spectroscopic Study of a Magnetically Rotating Arc in Argon Contaminated with Carbon Monoxide and Nitrogen**

N. Desaulniers-Soucy and J.-L. Meunier
Plasma Technology Research Centre (CRTP), Department of Chemical Engineering, McGill University, Montréal, Canada

4P4 **Experimental Investigations of the Production of a High Density Working Fluid Using a Coaxial Discharge**

M. Lehr,[1] L. Carswell,[1] A. Alaniz,[1] J. Degnan,[1] S. Englert,[1] T. Englert,[1] J. Holmes,[1] G. Kiuttu[1] and J. Graham[2]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Maxwell Laboratories, Inc., Albuquerque, NM

4P5 **Numerical Simulation of Advanced RF Plasma Sources**

E. Montalvo,[1] R. Carrera,[1] M. Lebrun,[2] L. Pekker[3] and V. Godyak[1]
[1]Valley Research Corporation, Austin, TX
[2]IFS, University of Texas at Austin, TX
[3]Electrical Engineering, University of Minnesota, MN

4P6 **Ion Kinetics in a Low Pressure RF Sheath**

M.A. Skorik and J.E. Allen
Department of Engineering Science, Oxford, UK

4P7 **Characteristics of a Wire Ion Plasma Source**

E. Hotta,[1] T. Osawa,[1] S. Nakao,[1] M. Suzuki,[1] H. Yasui[2] and T. Tamagawa[2]
[1]Tokyo Institute of Technology, Tokyo, Japan
[2]Toshiba Corporation, Kawasaki, Japan

4P8 **One Dimensional Model Calculations of Discharge Pumped Excimer Lasers Under Repetitive Operations**

K. Kasuya,[1] K. Horioka,[1] N. Hikida,[1] T. Miyoshi,[1] K. Nakata,[2] Y. Miyai,[2] Y. Kawakita[2] and E. Ohshita[2]
[1]Department of Energy Sciences, The Graduate School at Nagatsuta, Tokyo Institute of Technology, Japan
[2]High-Voltage R & D Dept., R & D Division, Nissin Elect. Co., Kyoto, Japan

4P9 **On Nonlinear Statistical Thermodynamics of Boundary Plasma with Postactions**

S.W. Temko, K.W. Temko and S.K. Kuz'min
Moscow Geological Prospecting Institute, Moscow, Russia

Poster Session 4P3-11: Electrical Gas Discharges (continued)

4P10 **Experimental Observation of Complex Interaction between Solitary-Like Current Density Filaments in a Glow-Discharge System**

H. Willebrand and H.G. Purwins
Institute of Applied Physics Munster, Germany

4P11 **Experimental Investigations of inhomogeneous Current Density Distributions in a Glow Disharge Plasma**

H. Willebrand, P. Ammelt
Instutute of Applied Physics, Munster, Germany

Wednesday, 3 June 1992

8:30 a.m. - Ballroom B/C

"The Compton Gamma Ray Observatory: Bursts, Pulsars, Quasars, and ?"

presented by

David J. Thompson

Gamma Ray Astrophysics Branch
NASA/Goodard Space Flight Center

Chairperson: Taner Uckan

Wednesday, 3 June 1992
9:45 a.m. - Ballroom D
Oral Sessions 5A: Magnetic Fusion and Ultrafast Z-Pinches
Session Chairperson: Kenneth A. Conner

5A1 **Force-Free Magnetic Field in the Torus of Arbitrary Aspect Ratio**

Y. Tsuji and H. Saeki
Faculty of Engineering, Ehime University, Matsuyama, Japan

5A2 **Theoretical Study of the Adiabatic Compression of a Cold, Dense Plasma by an Electromagnetically Imploded, Solid Liner**

T.W. Hussey,[1] R.E. Peterkin,[1] D. Dietz,[1] J.H. Degnan,[1] J.D. Beason,[1]
N.F. Roderick[2] and P.J. Turchi[3]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Department of Chemical and Nuclear Engineering, University of New Mexico, Albuquerque, NM
[3]Department of Aeronautical Engineering, Ohio State University, Columbus, OH

5A3-4 Invited

Terawatt Fiber Pinch Experiments

W. Kies,[1] G. Decker,[1] M. Mälzig,[1] C. van Calker,[1] J. Westheide,[1] G. Ziethen,[1] H. Bachmann,[2] K. Baumung,[2] H. Bluhm,[2] D. Rusch,[2] W. Ratajczak,[2] O. Stoltz[2] and J.M. Bayley[3]
[1]Institut für Experimentalphysik, Heinrich-Heine-Universität, Düsseldorf, Germany
[2]Institut für Neutronenphysik und Reaktortechnik, Kernforschungs- zentrum, Karlsruhe, Germany
[3]Imperial College of Science, Technology and Medicine, London, UK

5A5 **Argon and Krypton Gas Puff Z-Pinch Implosions at 3.5 MA**

C. Deeney, P.D. LePell, B. Failor, S. Wong, J. Meachum[1], F.L. Cochran, K.G. Whitney, J. W. Thornhill, and M.C. Coulter[2]
[1]Physics International Company, San Leandro, CA
[2]Naval Research Laboratory, Washington, D.C.

5A6 **An Advanced Theory of Stark Broadening for Diagnostics of Dense Plasmas**

Y. Ispolatov and E. Oks
Physics Department, Auburn University, Auburn, AL

Wednesday, June 3, 1992
11:15 a.m. - Ballroom D
Oral Session 5A: X-Ray Lasers
Session Chairperson: Jorge Rocca

5A7 **Optimizing the He-like Ionization State in Na/Ne X-ray Laser Experiments on Saturn**

T. Nash,[1] R.B. Spielman,[1] M.K. Matzen,[1] J.Porter,[2] J. Apruzese[3]
and R.W. Clark[3]
[1]Sandia National Laboratories, Albuquerque, NM
[2]Lawrence Livermore National Laboratory, Livermore, CA
[3]Naval Research Laboratory, Washington, DC

5A8 **Diagnosing Spatial Profiles of Ionization and Compression in Neon Gas Cells Irradiated by Sodium and Sodium/Potassium Z Pinches on Saturn**

J.P. Apruzese,[1] R.W. Clark,[1] T. Nash,[2] R.B. Spielman[2] and M.K. Matzen[2]
[1]Naval Research Laboratory, Washington, D.C.
[2]Sandia National Laboratories, Albuquerque, NM

5A9-10 <u>Invited</u>

Time Resolved Spectroscopic Diagnostics of a Capillary Discharge Experiment

C.A. Morgan, B.L. Welch, J.C. Moreno and H.R. Griem
Laboratory for Plasma Research, University of Maryland,
College Park, MD

5A11 **Soft X-ray Radiation of H-like and Li-Like Ions in a Fast, High Power Capillary Discharge**

J.J. Rocca, B. Szapiro, D. Cortazar, F. Tomasel, J. Hung and K. Floyd
Electrical Engineering Department, Colorado State University,
Fort Collins, CO

Wednesday, June 3, 1992
9;45 a.m. - Ballroom E
Oral Session 5B: Ball Lightening and Other Spherical Plasmas
Session Chairperson: E. Panarella

5B1 **The Spherical Pinch as a Soft X-ray Source for Microlithography and Other Industrial Applications**

S. Aithal,[1] M. Lamari[1] and E. Panarella[2]
[1]Advanced Laser and Fusion Technology, Inc., (ALFT), Canada
[2]Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN

5B2 **Observation of Closed Current Loops in High Power Arcs**

I. Alexeff and M. Rader
University of Tennessee, Knoxville, TN

5B3 **The Spherical Pinch as a Neutron Generator for Fusion Studies and Industrial Neutron Radiography**

M. Lamari,[1] S. Aithal,[1] and E. Panarella[2]
[1]Advanced Laser and Fusion Technology, Inc., (ALFT), Canada
[2]Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN

5B4 **Ball Lightning as a Spherical Plasma Configuration of Relevance to Industrial Plasma Engineering**

J.R. Roth
UTK Plasma Science Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN

5B5-6 **Invited**

Studies of Spherical Inertial-Electrostatic Confinement

G.H. Miley
Department of Nuclear Engineering, University of Illinois, Urbana, IL

5B7 **Fiber Theory Applied to the Inductive Spherical Pinch**

N.A. Salingaros
Department of Mathematics, Southern Methodist University, Dallas, TX

Oral Session 5B: Ball Lightening and Other Spherical Plasmas (continued)

5B8 **Theoretical Studies on Central Plasma Compression by Imploding Shock Waves in Spherical Pinch**

D.P. Singh,[1] F. Giammanco,[2] M. Vaselli[1] and V. Palleschi[1]
[1]Istituto di Fisica Atomica E Molecolare C.N.R., Pisa, Italy
[2]Dipartimento di Fisica - Universita' di Pisa, Pisa, Italy

5B9 **Techniques for Confinement Enhancements in Spherical Pinch**

Y.C. Thio
Department of Physics, University of Miami, Miami, Florida

Wednesday, 3 June 1992
9:45 a.m. - Ballroom F
Oral Session 5C: Fast Wave Microwave Devices
Session Chairperson: John Swegle

5C1-2 Invited

A High-Efficiency 33 GHz Free Electron Laser with a Reversed Axial Magnetic Field

M.F. Conde and G. Bekefi
Department of Physics and Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA 02139

5C3 **Relativistic Cyclotron Resonance Masers with Inhomogeneous External Magnetic Fields**

G.S. Nusinovich
Laboratory or Plasma Research, University of Maryland,
College Park, MD

5C4 **Theoretical and Experimental Studies of Anomalously High Efficiency in a Three Cavity Gyroklystron Amplifier**

P.E. Latham, U.-V. Koc, W. Main, S. Tantawi, B. Hogan and W. Lawson
Laboratory for Plasma Research, University of Maryland,
College Park, MD

5C5 **Generation of High Power Radiation in a Large-Orbit Gyrotron with a Rectangular Interaction Region**

D.J. Radack, K. Ramaswamy, J. Rodgers, J. Pyle and W.W. Destler
Laboratory for Plasma Research, University of Maryland,
College Park, MD

5C6 **Experimental Development of a Free-Electron Laser Amplifier at 94 GHz**

S.W. Bidwell,[1] Z.X. Zhang,[1] T.M. Antonsen, Jr.,[1] W.W. Destler,[1] H.P. Freund,[2] V.L. Granatstein,[1] B. Levush[1] and J. Rodgers[1]
[1]Laboratory for Plasma Research, University of Maryland,
College Park, MD
[2]Science Applications International Corp., McLean, VA

Oral Session 5C: Fast Wave Microwave Devices (continued)

5C7-8 Invited

Single-Mode Operation of a 85 GHz Quasioptical Gyroklystron

R.P. Fischer, A.W. Fliflet and W.M. Manheimer
Particle Beam and Radiation Generation Section, Plasma Physics Division, U.S. Naval Research Laboratory, Washington, DC

5C9 **Interaction of an Electron Beam with the Waves in Hybrid Plasma Microwave Devices**

N.I. Karbushev
Moscow Radiotechnical Institute, Moscow, Russia

Wednesday Morning, 3 June 1992
Poster Session 5P1-12/A: Fast Opening Switches

5P1 **Simple Methods of Square Pulse Generation by Inductive Pulse Forming Lines and a Field Effect Transistor as an Opening Switch**

B.N. Ding, T.J. Myers and M.J. Rhee
Laboratory for Plasma Research and Department of Electrical Engineering, University of Maryland, College Park, MD

5P2 **Experimental Investigations of Microsecond Range Plasma Current Switch**

G.I. Dolgachev, L.P. Zakatov and A.G. Ushakov
I.V. Kurchatov Institute of Atomic Energy, Moscow, Russia

5P3 **Review of 1-μs Plasma Opening Switch Research at NRL**

R.J. Commisso,[1] J.R. Boller,[1] G. Cooperstein,[1] P.J. Goodrich,[2] J.M. Grossman,[1] D.D. Hinshelwood,[2] J.C. Kellogg,[1] D. Mosher,[1] P.F. Ottinger[1] and B.V. Weber[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, D.C.
[2]JAYCOR, Vienna, VA

5P4 **Limitations on POS Operation due to Vacuum Flowing Electrons**

J.R. Goyer, D. Kortbawi, J.C. Riordan, I.S. Roth, F.K. Childers and P.S. Sincerny
Physics International Company, San Leandro, CA

5P5 **The Microsecond Plasma Opening Switch Investigation with Gas-Puff Plasma Guns**

A.A. Sinebrjukhov and V.A. Sinebrjukhov
Institute of Electrophysics, Ekaterinburg, Russia

5P6 **Operation of Sandia's Long Conduction Time Plasma Opening Switch into High Impedance Loads**

M.E. Savage,[1] W.W. Simpson[1] and M.A. Usher,[2]
[1]Sandia National Laboratories, Albuquerque, NM
[2]General Technology Corporation, Albuquerque, NM

5P7 **Inductive Storage Experiment with Plasma Guns or Flashboards**

L. Voisin and J. Ribolzi
Commissariat Energie Atomique, France

Poster Session 5P1-12/A: Fast Opening Switches (continued)

5P8 **Numerical Simulation of Plasma Dynamics in a Microsecond Plasma Opening Switch**

V.M. Bystritskii, I.V. Lisitsyn and A.A. Sinebrjukhov
Institute of Electrophysics, Ekaterinburg, Russia

5P9 **Mass Estimates for MARAUDER Compact Toroids**

M.E. Dearborn,[1] D.E. Bell,[1] J.H. Degnan,[1] T.W. Hussey,[1] F.M. Lehr,[1]
R.E. Peterkin,[1] E.L. Ruden,[1] M.C. Scott,[2] J.D. Graham,[2] and S.K. Coffey,[3]
[1]Phillips Laboratory, Kirtland, AFB, NM
[2]Maxwell Laboratories, Inc., Albuquerque, NM
[3]Physical Sciences, Inc., Alexandria, VA

5P10 **Two and Three Dimensional Imaging of Compact Toroid Plasmas using Fast Photography**

S.E. Englert,[1] D.E. Bell[1] and S.K. Coffey,[2]
[1]Phillips Laboratory, Kirtland, AFB, NM
[2]Physical Sciences, Inc., Alexandria, VA

5P11 **Spectral Analysis of Accelerated Compact Toroids Formed with Nitrogen or Argon Gas**

G.F. Kiuttu, M.E. Dearborn, T.J. Englert and D.W. Price
Phillips Laboratory, Kirtland, AFB, NM

5P12/A **Spectroscopic Investigations of a Plasma Opening Switch Using a Novel Gaseous Plasma Source**

M. Sarfaty, Ya. Krasik, R. Arad, A. Weingarten, Y. Maron[1] and A. Fisher[2]
[1]Physics Department, Weizmann Institute of Science, Rehovot, Israel
[2]Naval Research Laboratory, Washington, D.C.

Wednesday Morning, 3 June 1992
Poster Session 5P12/B-24: Plasma Processing

5P12/B **Decomposition of CCl_4 in an E-Beam Reactor**
L. Bromberg, D.R. Cohn, M. Koch, R.M. Patrick and P. Thomas
Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA

5P13 **Excimer Laser Ablation Processing of Materials in Gas and Plasma Environments**
C.H. Ching, P.L.G. Ventzek, R.M. Gilgenbach and R.A. Lindley
Intense Energy Beam Interaction Laboratory, Nuclear Engineering Department, University of Michigan, Ann Arbor, MI

5P14 **Optical Diagnostics of Copper Vapor Laser Machining of Polymers**
P.L.G. Ventzek, R.M. Gilgenbach, C.H. Ching, R.A. Lindley and W.B. McColl
Intense Energy Beam Interaction Laboratory, Nuclear Engineering Department, University of Michigan, Ann Arbor, MI

5P15 **The Electrode Sheath Width in RF Discharges: A Comparison of Analytic Models and Experimental Measurements**
R.B. Piejak, V.A. Godyak and B.M. Alexandrovich
GTE Laboratories Inc., Walthamm MA

5P16 **Plasmas for Superconducting Active Antennas**
T. Ohnuma, Y. Matsuura and Atsushi Marumoto
Department of Electrical Engineering, Tohoku University, Sendai, Japan

5P17 **X-ray Imaging for Electron Cyclotron Resonance Processing Plasmas**
K.H. Chew, J.L. Shohet and T.J. Castagna
Engineering Research Center for Plasma-Aided Manufacturing, University of Wisconsin, Madison, WI

5P18 **On the Silicon Nitride Film Formation from N_2-SiH_4 Electron Cyclotron Resonance Plasma**
S.K. Song and H.Y. Chang
KAIST, Department of Physics, Taejon, Korea

Poster Session 5P12/B-24: Plasma Processing (continued)

5P19 **Modeling Diamond Deposition in Microwave Assisted CVD Reactors**

E. Hyman,[1] K. Tsang,[1] A. Drobot[1] and B. Lane[2]
[1]Science Applications International Corporation, McLean, VA
[2]Plasma Dynamics, Belmont, MA

5P20 **Stabilization and Performance Enhancement of a Large Volume Unmagnetized Microwave Plasma Facility (MPF)**

S.G. Kamath and J.R. Roth
UTK Plasma Science Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN

5P21 **Experimental Generation of a Steady-State Glow Discharge at Atmospheric Pressure**

J.R. Roth, M. Laroussi and C. Liu
UTK Plasma Science Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN

5P22 **A Cold Non-Equilibrium RF-Discharge Plasma in Humid Air**

E.T. Protasevich
Tomsk Polytechnic Institute, Tomsk, Russia

5P23 **Electrode Material Transport and Discharge Transition in Plasma Manufacturing**

L. Pekker[1], R.B. Luban, I.V. Galinov[2], and R. Carrera[3]
[1]University of Minnesota, Minneapolis, MN
[2]Inst. Materials Sciences, Kiev
[3]Valley Research Corporation, Austin, TX

5P24 **Remote ECR Plasma Deposition of Diamond Thin Films from Water-Methanol Mixtures**

K.A. Buckle[1], R. Koba[2] and J. Rodgers[1]
[1]Electrical Engineering, University of South Florida, Tampa, FL
[2]Plasma-Therm I.P. Inc., St. Petersburg, FL

Wednesday, 3 June 1992

2:00 p.m. - Ballroom B/C

"Strongly Coupled Plasmas - Astrophysical and Laboratory Regimes"

presented by

Kenneth Golden
Dept. of Computer/Electrical Engineering
The University of Vermont

Chairperson: M. B. Silevitch

Wednesday, 3 June 1992
3:00 p.m. Ballroom D
Oral Session 6A: Fast Opening Switches
Session Chairperson: J. T. Crow

6A1 **Pulse Compression in a GaAs Photoconductive Semiconductor Opening Switch Controlled Pulsed Power System**

E.E. Funk and C.H. Lee
Department of Electrical Engineering, University of Maryland, College Park, MD

6A2 **Diode Voltage Measurement with a Bremsstrahlung Spectrometer in Plasma Opening Switch Systems**

J.C. Riordan, J.R. Goyer, D. Kortbawi, J.S. Meachum, R.S. Mendenhall and I.S. Roth
Physics International Company, San Leandro, CA

6A3-4 Invited Paper

Plasma Flow Switch Development at Los Alamos National Laboratory

J.V. Parker
Physics Division, Los Alamos National Laboratory, Los Alamos, NM

6A5 **Simulation of Initial Plasma Motion in the PBFA II Opening Switch**

M.A. Sweeney[1] and M.H. Frese[2]
[1]Sandia National Laboratories, Albuquerque, NM
[2]NumerEx, Albuquerque, NM

6A6 **Microsecond Generators with Plasma Opening Switches in I.V. Kurchatov Institute of Atomic Energy Frequency Operation of Generators**

V.M. Babykin, Yu.P. Golovanov, G.I. Dolgachev, L.P. Zakatov, Yu.I. Kovalev, A.G. Ushakov and R.V. Chikin
I.V. Kurchatov Institute of Atomic Energy, Moscow, Russia

6A7-8 Invited

Magnetic Field Evolution, Flux Penetration and Energy Dissipation due to the Hall Field in the Plasma Opening Switch Configuration

A. Fruchtman
Physics Department, Weizmann Institute of Science, Israel

6A9 **ASO-II, A Small Inductive Energy Storage Pulsed Power Generator**

C. Grabowski, T. Seki, H. Akiyama and S. Maeda
Department of Electrical Engineering, Kumamoto University, Kumamoto, Japan

Wednesday,
3 June 1992
3:00 p.m. - Ballroom E
Oral Session 6B: Plasma Focus and Gaseous Electronics
Session Chairperson: Peter Bletzinge

6B1 **Monte Carlo Simulation of Electron Kinetics at Very High E/N**

Z.Lj. Petrovic,[1,2] V. Stojanovic,[2] B. Jelenkovic[1,2] and A.V. Phelps[1]
[1]JILA, University of Colorado and NIST, Boulder, CO
[2]Institute of Physics, Beograd, Yugoslavia

6B2 **The Effect of Transverse Magnetic Fields on the Resistance of a Hollow Cathode Discharge**

T. Tessnow,[1] K.H. Schoenbach,[1] R. Germer[2] and H.J. Eichler[3]
[1]Physical Electronics Research Institute, Old Dominion University, Norfolk, VA
[2]FH Telekom and ITP, Berlin, Germany
[3]Technical University, Berlin, Germany

6B3 **Effect of Collisions on Ion Dynamics in the Downstream Region of an ECR Plasma Etching Experiment**

M. Hussein, G.A. Emmert, N. Hershkowitz and R.C. Woods
Engineering Research Center for Plasma-Aided Manufacturing, University of Wisconsin, Madison, WI

6B4 **Characterization of a Planar RF Induction Plasma Source for Polymer Film Deposition Processes**

L.J. Mahoney, J.L. Shohet and A.E. Wendt
Engineering Research Center for Plasma-Aided Manufacturing, University of Wisconsin, Madison, Wisconsin

6B5 **Modeling Inductively Coupled Discharges for Plasma Processing**

M.J. Kushner T.J. Sommerer and S.J. Choi
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

6B6 **Destruction Mechanisms for Carbon Tetrachloride and Formaldehyde in Atmospheric Pressure Discharges**

D.G. Storch and M.J. Kushner
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

Oral Session 6B: Plasma Focus and Gaseous Electronics (continued)

6B7 **A Study of Chlorine-Containing Plasma Etching Discharges Using a Monte Carlo-Fluid Hybrid Model**

T.J. Sommerer and M.J. Kushner
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

6B8 **Ion Energy Distributions in Multicomponent Gas Mixtures**

H.H. Hwang T.J. Sommerer and M.J. Kushner
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

6B9 **A Study of Microscopic Plasma-Particle Interactions in Glow Discharges**

S.J. Choi, H.W. Hwang and M.J. Kushner
Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL

Wednesday Afternoon, 3 June 1992
Poster Session 6P1-9: Ultrafast Z-Pinches

6P1 **Gas-Puff Z-Pinch Plasma**

H. Akiyama, C. Grabowski, S. Ueda, K. Imasaka, S. Katsuki and S. Maeda
Department of Electrical Engineering, Kumamoto University, Kumamoto, Japan

6P2 **High Current Operation of a Low Impedance Line Driven Vacuum Spark**

H. Chuaqui,[1] M. Favre,[1] L. Soto[2] and E. Wyndham[1]
[1]Facultad de Física, Pontificia Universidad Católica de Chile, Santiago, Chile
[2]Fundación Andes

6P3 **Radiation Hydrodynamics of an Argon Gas Puff Plasma**

J. Davis[1] and F.L. Cochran[2]
[1]Radiation Hydrodynamics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C.
[2]Berkeley Research Association, Springfield VA

6P4 **Interferometry of Single and Double Wire Plasma Radiation Source Loads**

R.C. Hazelton, E.J. Yadlowsky, J.J. Moschella and T.B. Settersten
HY-Tech Research Corporation, Radford, VA

6P5 **A Frozen Gas Fiber Array Extrusion System**

E.L. Ruden,[1] B.W. Mullins[1] and D.G. Gale[2]
[1]Phillips Laboratory, Kirtland AFB, NM
[2]Maxwell Laboratories, Inc., Albuquerque, NM

6P6 **Instability Studies on a Fiber Z Pinch**

D.W. Scudder,[1] J.S. Shlachter,[1] F.J. Wysocki,[1] R.A. Riley[2] and R.H. Lovberg[2]
[1]Los Alamos National Laboratory, Los Alamos, NM
[2]University of California at San Diego, CA

6P7 **Deuterium-Fiber-Initiated Z-Pinches: Simulation vs. Experiment**

P.T. Sheehey,[1] I.R. Lindemuth,[2] R.H. Lovberg[3] and R.A. Riley, Jr.[3]
[1]Department of Physics, UCLA, Los Angeles, CA
[2]Los Alamos National Laboratory, Los Alamos, NM
[3]Department of Physics, UC San Diego, La Jolla, CA

Poster Session 6P1-9: Ultra-Fast Z Pinches (continued)

6P8 **Influence of an Axial Magnetic Field and Current Risetime on Aluminum Vapor Z-Pinch**

B.Etlicher, L. Veron, S. Attelan, C. Rouille[1], and F.J. Wessel[2]
[1]Laboratoire de Physique des Milieux Ionises, CNRS-Ecole Polytechnique, France
[2]Department of Physics, Univerity of California, Irvine, CA

6P9 **MHD-Instability of Dense Dissipative Z-Pinches**

V.V. Neudachin and P.V. Sasorov
Institute of Theoretical and Experimental Physics, Moscow, Russia

Wednesday Afternoon, 3 June 1992
Poster session 6P10-12: X-Ray Lasers

6P10 **Charge Exchange Pumping in the Vacuum Ultraviolet**

C. Barrett,[1] W. Ogle,[2] Scott Robertson[1] and Bob Walch[3]
[1]Department of Astrophysical, Planetary, and Atmospheric Sciences, University of Colorado, Boulder, CO
[2]University New Mexico, NM
[3]University of Northern Colorado, CO

6P11 **X-ray Lasing in an Ultra Short Pulsed Produced Fluorine Plasma**

J. Davis, R. Clark and J. Giuliani
Radiation Hydrodynamics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C.

6P12 **Demonstration of Large GL X-ray Laser in NE-Like Germanium**

S.J. Wang, Y. Cun and Z.C. Tao
China Academy of Engineering Physics, Chendu, China

Wednesday Afternoon, 3 June 1992
Poster Session 6P13-19: Fast Wave Microwave Devices

6P13 **Theory of Phase-Locked Gyrotron Oscillators Operating at Second Cyclotron Harmonic**

P.E. Latham, G.S. Nusinovich and B. Levush
Laboratory for Plasma Research, University of Maryland, College Park, MD

6P14 **Design Studies of High-Power, Two-Cavity, Second Harmonic Gyroklystrons**

W. Lawson, P.E. Latham, H.W. Matthews, B. Hogan, V. Specht, M.K.E. Lee, C.D. Striffler and V.L. Granatstein
Laboratory for Plasma Research, University of Maryland, College Park, MD

6P15 **Observations of Frequency Upshifts in a Raman, Free-Electron Laser Amplifier**

C.J. Taylor, M. Conde, G. Bekefi, G. Shvets and J.S. Wurtele
Department of Physics and Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA

6P16 **Numerical Simulation of Free-Electron Laser Amplifier using Sheet Electron Beam and Short Period Planar Wiggler**

Z.X. Zhang,[1] S.W. Bidwell,[1] H.P. Freund,[2] V.L. Granatstein[1] and B. Levush[1]
[1]Laboratory for Plasma Research, University of Maryland, College Park, MD
[2]Science Applications International Corporation, McLean, VA

6P17 **Numerical Simulation of the Interaction Between Relativistic Electron Beam and Magnetized Plasma in a Waveguide**

S. V. Gerasimov and N.I. Karbushev
Moscow Radiotechnical Institute, Moscow, Russia

6P18 **Investigation of Plasma Producing by an Electron Beam in a Gas in a Thin Long Waveguide**

K.G. Gureyev,[1] N.I. Karbushev[1] and A.G. Shkvarunets[2]
[1]Moscow Radiotechnical Institute, Moscow, Russia
[2]Institute of General Physics, Moscow, Russia

6P19 **Multy-Wave Interaction of the Intense Relativistic Electron Beam with a Plasma Waveguide**

N.I. Karbushev
Moscow Radiotechnical Institute, Moscow, Russia

Wednesday Afternoon, 3 June 1992
Poster Session 6P20-22: Electromagnetic/Electrothermal Launchers

6P20 **Coated and Refractory Material Surfaces for Electrically-Driven Launchers and Fusion Devices Applications**

D. Black, W. Eddy, M. Bourham, J. Gilligan and O. Hankins
Department of Nuclear Engineering, North Carolina State University, Raleigh, NC

6P21 **Conductivity Measurements of Plasma Temperature in a Electrothermal Launcher**

W. Eddy, M. Bourham, O. Hankins and J. Gilligan
Department of Nuclear Engineering, North Carolina State University, Raleigh, NC

6P22 **Magnetic Vapor Shield Mechanism in Electrically-Driven Launchers**

W. Eddy, J. Gilligan, M. Bourham and O. Hankins
Department of Nuclear Engineering, North Carolina State University, Raleigh, NC