SESSION 1

ICOPS 2004

8:00 Monday, June 28, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Karl Schoenbach, Old Dominion University

Welcome to ICOPS 2004:

Robert J. Commisso
2004 ICOPS Chairperson
Naval Research Laboratory

Plenary Talk - PL1:

Non-Equilibrium Plasma-Based Sterilization: Overview, State-of-the-Art, and Challenges

Mounir Laroussi
Old Dominion University

9:30 Monday, June 28, 2004 **Constellation Ballroom C**

Chairperson: John Apruzese, Naval Research Laboratory

Oral Session 1A: Fast Z-Pinches - I

1A1-2: High-Resolution Spectrscopic X-Ray Diagnostics for Studying the Ion-Kinetic Energies at the Stagnation of a Z-Pinch Plasma
E. Kroupp[1], D. Carasso[1], D. Osin[1], G. Baruch[1], A. Starobinets[1], V. Fisher[1], V. Bernshtam[1], Yu. Ralchenko[1], Y. Maron[1] I. Uschmann[2], E. Förster[2] and A. Fisher[3]
[1]Faculty of Physics, Weizmann Institute of Science, Rehovot, Israel
[2]Friedrich-Schiller Universität, Germany
[3]Faculty of Physics, Technion, Israel

1A3: Nested Stainless Steel Wire Array Diameter Variations on the Z Accelerator
C.A. Coverdale[1], C. Deeney[1], P. D. LePell[2], B.M. Jones[1], J. Davis[3], R.W. Clark[3], J.P. Apruzese[3], J.W. Thornhill[3], and K.Whitney[4]
[1]Sandia National Laboratories
[2]Ktech Corporation
[3]Naval Research Laboratory
[4]Berkeley Research Associates

1A4: Nested Stainless Steel Wire Array Variations on the Z Accelerator
B. Jones[1], C. Coverdale[1], P.D. LePell[2], C. Deeney[1], D. Sinars[1], M. Cuneo[1], E. Waisman[1], D. Bliss[1], G. Sarkisov[2], S. Rogowski[1], J. Chittenden[3], R. Clark[4]
[1]Sandia National Laboratories, USA
[2]Ktech Corp., USA
[3]Imperial College, UK
[4]Naval Research Laboratory, USA

1A5-6: Factors Affecting Energy Deposition and Core Expansion in Low Current Single Wire Experiments
P.U. Duselis, J.A. Vaughan, Min Hu, B.R. Kusse
Laboratory of Plasma Studies, Cornell University, Ithaca, NY 14853

1A7: Tungsten Wire-Array Dynamics and Power Variations from 20 mm Arrays on the Sandia Z Facility
Daniel B. Sinars[1], Michael E. Cuneo[1], David F. Wenger[1], David E. Bliss[1], Michael G. Mazarakis[1], Sonrisa Rogowski[1], Gennady S. Sarkisov[2], and Eduardo Waisman[3]
[1]Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185-1193
[2]Ktech Corporation, 1300 Eubank Blvd. SE, Albuquerque, NM 87123
[3]Consultant, Sandia National Laboratories

1A8: Plasma Dynamics in Radial Wire Array Z-Pinches
S.V. Lebedev, D.J. Ampleford, S.N. Bland, S. Bott, J.P. Chittenden, A. Ciardi, C. Jennings, M.G. Haines, G. Hall, J.B.A. Palmer, and J. Rapley
Blackett Laboratory, Imperial College London SW7 2BW UK

1A9: First Fast Z-pinch Current Scaling Experiments Suggest Faster Radiated Power Dependence
Michael G. Mazarakis, Mike E. Cuneo, William A. Stygar, Daniel B. Sinars, Christopher Deeney, Kenneth W. Struve, Dillon H.McDaniel, John S. McGurn.
Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185-1194

1A10: Forming of Structures During Wire Array Compression
Igor V. Glazyrin, N.S.Eskov, O.G.Kotova, A.N.Shushlebin, A.N.Slesareva, and V.I.Volkov
Russian Federal Nuclear Center - VNIITF, P.O.Box 245, Snezhinsk, Chelyabinsk Region, Russia

9:30 Monday, June 28, 2004 **Constellation Ballroom D**

Chairperson: Mounir Laroussi, Old Dominion University

Oral Session 1B: Medical, Biological, and Environmental Applications - I

1B1: Control of Uniformity of Plasma-Surface Modification Inside of Small-Diameter Polyethylene Tubing Using Microplasma Diagnostics
J.L. Lauer[1], J.L. Shohet[1], R.M. Albrecht[2], C. Pratoomtong[1], R. Murugesan[1], R.D. Bathke[1], S. Esnault[3], J.S. Malter[3], S.B. Shohet[4], and U.H. von Andrian[5]
[1]Dept. of Electrical & Computer Engineering, University of Wisconsin-Madison
[2]Dept. of Animal Sciences, University of Wisconsin-Madison
[3]Dept. of Laboratory Medicine and Pathology, University of Wisconsin-Madison
[4]Dept. of Laboratory Medicine, University of California-San Francisco
[5]Center for Blood Research, Harvard Medical School

1B2: Inactivation of Biofilm-Forming Bacteria using Cold Atmospheric Plasmas and Potential Application for Decontamination of Fresh Foods
D. Molha[1], T. Brocklehurst[2], G. Shama[1], and M. G. Kong[3]
[1]Department of Chemical Engineering, Loughborough University, Loughborough, LE11 3TU, UK
[2]Institute of Food Research, Colney, Norwich NR4 7UA, UK
[3]Department of Electronic and Electrical Engineering, Loughborough University, Loughborough, LE11 3TU, UK

1B3-4: Operational Experience of Industrial Scale Electroporation Devices
C. Schultheiss[1], M. Sack[1], H. Bluhm[1], H.G. Mayer[1], and M. Kern[2]
[1]Forschungszentrum Karlsruhe GmbH, Institute for Pulsed Power and Microwave Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany
[2]KEATEC GmbH, D-68753 Waghäusel, Saarstr. 4

1B5: Plasma Interactions with Living Cells
E. Stoffels, I.E. Kieft, R.E.J. Sladek, E.P. van der Laan, D. Bronneberg, and J.L.V. Broers
Department of Biomedical Engineering, Eindhoven University of Technology,
PO Box 513, 5600 MB Eindhoven, The Netherlands

1B6: Non-Chemical Dielectric Barrier Discharge Treatment as a Method of Insect Control
Brian L. Bures[1], Kevin V. Donohue[2], Mohamed A. Bourham[1], and R. Michael Roe[2]
[1]Dept. of Nuclear Engineering, NCSU, Raleigh, NC
[2]Dept. of Entomology, NCSU, Raleigh, NC

1B7: The Pulsed Plasma Systems for Applications
Sergey A. Korenev and Ivan S. Korenev
STERIS CORPORATION, 2500 Commerce Drive, Libertyville, IL 60048, USA

1B8: Sterilization of Dental Bacteria in a Flowing N_2-O_2 Post Discharge Reactor: Roles of Plasma Species and of Temperature
F. Gaboriau, J.P Sarrette, S. Villéger, S.Cousty , M.Sixou and A. Ricard
CPAT, CNRS-Université Paul Sabatier, 118 rte de Narbonne, 31062 Toulouse, France

1B9: Bacterial Deactivation in Open-Air by the Afterglow Plume Emitted from a Grounded Hollow Slot Electrode
Ashish Sharma, Amy Pruden, Nejat Neisan, Zengqi Yu, and George J. Collins
Colorado State University, Fort Collins, CO 80523

9:30 Monday, June 28, 2004 **Constellation Ballroom E**

Chairperson: Wayne Scales, Virginia Polytechnic Institute and State University

Oral Session 1C: Dusty Plasmas - I

1C1-2: Dust Molecules, Strings, and Crystals
Martin Lampe, Glenn Joyce, and Gurudas Ganguli
Naval Research Laboratory, Washington, DC 20375-5346

1C3: A Model for the Condensation of a Dusty Plasma
P.M. Bellan
Caltech, Pasadena CA 91125

1C4: Observation of Microparticle Gyromotion in a Magnetized DC glow discharge dusty plasma
W.E. Amatucci, D.N. Walker, G. Gatling, and E.E. Scime
Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

1C5: Boundary Phenomena and Thermal Properties of Dusty Plasmas Measured Using Stereoscopic Particle Image Velocimetry
Edward Thomas, Jr. and Jeremiah Williams
Physics Department, Auburn University

1C6: Wave Electric Field Measurements in a Dusty Plasma In The Polar Summer Mesosphere Gathered On A Nasa Sounding Rocket
Robert Pfaff[1], Robert Holzworth[2], Richard Goldberg[1], and Charles Croskey[3]
[1]NASA/Goddard Space Flight Center, Laboratory for Extraterrestrial Physics Code 696 Greenbelt, MD, 20771, USA
[2]University of Washington Seattle, WA, 98195
[3]Penn State University, University Park, PA, 16802

1C7-8: Rotation Waves and Strong Turbulence in a Multi-Component Plasma
L, Rudakov,1 G. Ganguli, and W. E. Amatucci
Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

1C9: Vertical Oscillations of Magnetized Particles in Complex Plasmas
V.V. Yaroshenko[1,2], G.E. Morfill[1], and D. Samsonov[1]
[1]Center for Interdisciplinary Plasma Science Max-Planck-Institut fuer Extraterrestrische Physik, D-85740, Garching, Germany
[2]Institute of Radio Astronomy of National Academy of Sciences of Ukraine, Chervonopraporna 4, Kharkov, Ukraine 61002

1C10: Self-Consistent Calculation of Ion-Drag Force in a Gas Discharge Plasma.
I.V.Schweigert[1] and F.M. Peeters[2]
[1]Institute of Theoretical and Applied Mechanics, 630090 Novosibirsk, Russia
[2]Departement Natuurkunde, Universiteit Antwerpen (UIA), Universiteitsplein 1, B-2610 Antwerpen, Belgium

9:30 Monday, June 28, 2004 **Constellation Ballroom F**

Chairperson: Mark Kushner, University of Illinois

Oral Session 1D: Diagnostics of Processing Plasmas; Non-Equilibrium Plasma Processing - I

1D1: Molecular Absorption Spectroscopy of the Atmospheric Pressure Air DBD
Olga Minayeva and Mounir Laroussi
Center for Bioelectrics, Old Dominion University, Norfolk, VA

1D2: Characterization of Oxygen Plasma with a Fiber Optic Catalytic Probe and Determination of Recombination Coefficients
U. Cvelbar[1], M. Mozetic[1], and A. Ricard[2]
[1]Plasma Laboratory, Jozef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia
[2]CAPAT, University Paul Sabatier, 118 route de Narbonne, 31062 Toulouse, France

1D3: Electric Fields in a Sheath Near Discontinuous Surfaces
E.V. Barnat and G.A. Hebner
Sandia National Laboratories, Albuquerque, NM

1D4: Diagnostics of Processing Plasmas, Using Optical Emission from Trace Rare Gases
Vincent M. Donnelly
Dept. of Chem. Eng., University of Houston, Houston, TX 77204

1D5: Thin-Film Deposition on Suspended Particles In Dusty Plasma
Themis Matsoukas[1] and Jin Cao[2]
[1]Department of Chemical Engineering, Pennsylvania State University
[2]Air Products Inc.

1D6-7: Surface Dependent Effects at the Plasma-Surface Interface
G. A. Hebner
Sandia National Laboratories, Albuquerque NM 87185-1423

1D8: Synthesis of Nanocomposite Powders in Capacitively Coupled Plasma
A. Kouprine[1], F, Gitzhofer[1], M. Boulos[1], and T. Veres[2]
[1]Plasma Technology Research Center (CRTP), Université de Sherbrooke, Sherbrooke (Québec), J1K 2R1, Canada
[2]Industrial Materials Institute (IMI), National Research Council Canada, Boucherville (Québec), J4B 6Y4, Canada

1D9: Study of the Anodic Arc Discharge for Carbon Nanotube Synthesis
Michael Keidar[1], Yevgeny Raitses[2], Anthony M. Waas[1], and Daniel Tan[1]
[1]Department of Aerospace Engineering, University of Michigan, Ann Arbor MI 48109
[2]Princeton Plasma Physics Laboratory, Princeton NJ

9:30 Monday, June 28, 2004 **Constellation Ballroom A**

Poster Session 1P1-19: Vacuum Microelectronics; Microwave Systems; Microwave Plasmas

1P1: Self-Consistent Simulation of Multipactor Discharge HPM Dielectric Windows
C. Fichtl[1], K. Cartwright[1], P. Mardahl[1], and J. Verboncoeur[2]
[1]Air Force Research Lab
[2]U. California-Berkeley

1P2: Reflex Klystron using High Order Mode of Photonic Crystal Cavity
S.G. Jeon, Y.M. Shin, J.I. Kim, S.T. Han, K.H. Jang, J.K. So, and G.S. Park
School of Physics, Seoul National University, 151-742 Seoul, Korea

1P3: Theory of the Microelectronic Traveling Wave Klystron Amplifier with Field Emission Cathode Array
N.M. Ryskin[1], N.N. Surkov[1], D.I. Trubetskov[1], K. H. Jang[2], S. T. Han[2], J. K. So[2], and G. S. Park[2]
[1]School of Physics, Seoul National University, Korea
[2]Saratov State University, Saratov, Russia

1P4: Development of a W-band Dielectric Traveling-Wave Tube
Jose E. Velazco[1] and Peter H. Ceperley[2]
[1]Microwave Technologies Incorporated, Burke, VA 22015
[2]George Mason University, Fairfax, VA 22030-4444

1P5: Electron Beam Driven Modulation in THz range
S. Zhilkov[1] and G. Friedman[2]
[1]AccelBeam Photonics LLC, 201 Ironwood Circle, Elkins Park, PA 19027
[2]Drexel University, 3141 Chestnut Street, Philadelphia, PA 19104

1P6: Microwave Absorption on Thin Films and Contaminants
Herman L. Bosman, Y. Y. Lau, Wilken Tang, and R. M. Gilgenbach
University of Michigan, Ann Arbor, MI, 48109-2104, USA

1P7: High-Powered 83-GHz Millimeter-Wave Beam Sintering and Heat Treating of Engineered Ceramics in Controlled Atmospheres
J.S. Choi[1], R.W. Bruce[2], D. Lewis, III[3], R.L. Bruce[2], A.K. Kinkead[4], A.W. Fliflet[3], and M.A. Imam[5]
[1]Agency for Defence Development, Daejeon, 305-600, Korea
[2]RWBruce Associates Inc., Arnold, MD
[3]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[4]Leading Edge Technologies, Washington, DC
[5]Material Science and Technology Division, Naval Research Laboratory, Washington, DC 20375

1P8: Modeling the Millimeter-Wave Beam Joining of Ceramic Tubes
A.W. Fliflet[1], R.W. Bruce[2], D. Lewis, III[1], R.L. Bruce[2], and S.H. Gold[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]RW Bruce Associates Inc, Arnold, MD

1P9: Conversion of Submillimeter Wave Gyrotron Output into Gaussian Beam and its Application to Plasma Scattering Measurement
I. Ogawa[1], T. Idehara[1], Y. Itakura[1], T. Hori[2], H. Park[3], E. Mazzucato[3], and T. Munsat[3]
[1]Research Center for Development of Far-Infrared Region, Universityof Fukui, Fukui 910-8507, Japan
[2]Basic Research Center, Communications Research Laboratory, 4-2-1, Nukui-Kita, Koganei, 184-8795, Japan
[3]Princeton Plasma Physics Laboratory, Princeton, New Jersey 08543

1P10: Dynamics of Electron Beam Instability Development In Short-Pulse System for Microwave Generation
E.V.Rostomyan
Institute of Radiophysics and Electronics, National Ac. Sci., Armenia

1P11: Decrystallization Effects of $BaCO_3$ + $4Fe_3O_4$ Mixture Processed in a 2.45 GHz, H-Field and 83 GHz Gyrotron Cavities
Ramesh Peelamedu[1], Rustum Roy[1], Dinesh Agrawal[1], Larry Hurtt[1], Arne W. Fliflet[2], David Lewis III[2], and Ralph W. Bruce[3]
[1]Materials Research Institute, The Pennsylvania State University, University Park, PA 16802
[2]Radiation and Particle Beam Generation Section, Plasma Physics Division, Naval Research Laboratory, 4555 Overlook Avenue, SW, Washington, DC 20375
[3]ICARUS Research Inc. Bethesda, MD 20824

1P12: Microwave Generation by a Superluminal Source at Ultimate Current Densities
Yu. N. Lazarev, P. V. Petrov, and Yu. G. Syrtsova
Russian Federal Nuclear Center - Institute of Technical Physics, Snezhinsk, Chelyabinsk region, 456770, Russia

1P13: Measuring of Electric Fields in the Discharge of the Microwave Plasmatron
A.Ya. Kirichenko, and O.A. Suvorova
Institute of Radiophysics and Electronics of the NAS of Ukraine

1P14: Instability of the Drift Waves at Two-Component Solid-State Plasma
A.A. Bulgakov, and O.V. Shramkova
Institute of Radiophysics and Electronics of the NAS of Ukraine

1P15: XPS Studies on Microwave Plasma Modifications of Wood Surfaces
X. K. Yang[1], G. B. Du[2], T. C. Quan[1], X. Y.Yang[1], T. D. Wang[1], and J. Zhang[3]
[1]Analysis & Test Institute of Yunnan Province, Kunming, P.R. China
[2]Southwest Forestry College, Kunming, P.R. China
[3]Department of Physics, Yunnan University, Kunming, P.R. China

1P16: Plasma Toroid Formation by Polyphase Microwave Rotation
G. B. Kirby Meacham
Meacham Company

1P17: Charge Conserving Current Weights for PIC: Application to Cylindrical Coordinates
Andrew D. Greenwood and Keith L. Cartwright
Air Force Research Laboratory, Directed Energy Directorate

1P18: Absolute UV and VUV Emission in the 100-400 nm Region from 13.56 MHz Driven Hollow Slot Microplasmas Operating in Open Air
A. Rahman[1], A.P. Yalin[2], V.Surla[2], K. Hoshmiya[1], O. Stan[1], Z. Yu[1], and G.J. Collins[1]
[1]Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO – 80523
[2]Department of Mechanical Engineering, Colorado State University, Fort Collins, CO – 80523

1P19: Wave Driven Ar-N_2-O_2 Discharges as Sources of Active Species
J. Henriques[1,2], E. Tatarova[1], A. Ricard[2] and C.M. Ferreira[1]
[1]Centro de Física dos Plasmas, Instituto Superior Técnico, 1049-001 Lisboa, Portugal
[2]CPAT, Université Paul Sabatier, 118 rte de Narbonne, 31062 Toulouse, France

Poster Session 1P20-29: Ion, and Electron Sources

1P20: The Forming of Pulsed Electron and Ion Beams from Plasma Emitters
Sergey A. Korenev and Ivan S. Korenev
STERIS CORPORATION, 2500 Commerce Drive, Libertyville, IL 60048, USA

1P21: Generation of Subrelativistic Electrons at a Nanosecond Discharge in Dense Gas
Anatoly N. Maltsev
Institute of Atmospheric Optics Siberian Branch Russian Academy of Sciences

1P22: Experience of Design and Application of Plasma Electron Gun for Bad Vacuum Conditions
V. Burdovitsin, Y. Burachevsky, E. Oks, and M. Fedorov
Tomsk State University of Control Systems and Radioelectronics

1P23: Development and Testing of a Prototype Long Pulse Ion Source for the KSTAR NBI System
D.H. Chang[1], C.S. Seo[1], S.H. Jeong[1], B.H. Oh[1], K.W. Lee[1], J. Kim[2], and NBI group
[1]Korea Atomic Energy Research Institute, 150 Deokjin-dong, Yuseong-gu, Daejeon 305-353, Korea
[2]ProScience, Escondido, CA, USA

1P24: A Negative Ion Source for Spectrometer Calibration
R. Trainham[1], R.R. Bartsch[2], C. Ekdahl[2], A.P. Tipton[3], and H.A. Bender[3]
[1]Bechtel Nevada, Special Technologies Laboratory, 5520 Ekwill St., Suite B, Santa Barbara, CA 93111
[2]Los Alamos National Lababoratory, DX-6, P.O. Box 1663, Los Alamos, NM 87545
[3]Bechtel Nevada, Los Alamos Operations, 182 East Gate Drive, Los Alamos, NM 87544

1P25: Fundamental Study of Proton Source Based on Inertial Electrostatic Confinement Fusion for Medical Positron Emission Tomography
K. Yamauchi[1], A. Tashiro[1], M. Watanabe[1], A. Okino[1], T. Kohno[1], E. Hotta[1], and M. Yuura[2]
[1]Dept. of Energy Sciences, Tokyo Institute of Technology, Yokohama, Kanagawa 226-8502, Japan
[2]Pulse Electronic Engineering Co.,Ltd., Noda, Chiba 278-0016, Japan

1P26: Development and Testing of Improved High Power Thermionic Emitters for Magnatron Injection Gun Applications
B.Hogan, A. P. Williams, W. Lawson, E. S. Gouveia, and V. L. Granatstein
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD 20742

1P27: Electrical Breakdown and I-V Characteristics of a Hollow Electrode Radio Frequency Atmospheric Pressure glow Discharge of Linear Shape
Katsumi Hoshimiya[1,2], Ravi Rahul[1], Stan Ovidiu[1], and George. J. Collins[1]
[1]Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO 80523
[2]Ushio Inc, Japan

1P28: Temperature and Density Measurements of Miniature Microwave Plasma Discharges
J.J. Narendra, T.A. Grotjohn, and J. Asmussen
Department of Electrical and Computer Engineering, Michigan State University East Lansing, MI 48824

1P29: Beam Instability in Longitudinally Inhomogeneous Systems
I. Litovko[1] and A. Goncharov[2]
[1]Institute for Nuclear Research, NAN, Ukraine
[2]Institute of Physics, NAN, Ukraine

Poster Session 1P30-41: Laser Produced Plasmas

1P30: Measurements of Buried Layer Heating with the VULCAN Petawatt Laser
E.L.Clark[1], R.T.Eagleton[1], R.D.Edwards[1], R.G.Evans[1], T.J.Goldsack[1], S.F.James[1], C.C.Smith[1], R.J.Clarke[2], and D.Neely[2]
[1]AWE Aldermaston, Reading, RG7 4PR, UK
[2]Central Laser Facility, CCLRC Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, OX11 0QX, UK

1P31: Femtosecond Time-Resolved Measurements of Interband Transition in Ultrathin Gold Foils Under Ultrafast Excitation
Y. Ping[1], T. Ao[2], K. Widmann[1], D.F. Price[1], and A. Ng[1,2]
[1]Dept. of Physics & Advanced Technologies, Lawrence Livermore National Laboratory, 7000 East Avenue, Livermore, CA, 94550, USA
[2]Dept. of Physics & Astronomy, University of British Columbia, 6224 Agricultural Road, Vancouver, B.C. V6T 1Z1, Canada

1P32: Nonlinear Laser Synchrotron Source Experiment for Tunable, Monochromatic X-rays
R.P. Fischer[1], A. Ting[1], D. Gordon[1], I. Alexeev[2], E. Briscoe[3], and P. Sprangle[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]National Research Council Research Associate at the Naval Research Laboratory
[3]RSI, Inc., Lanham, MD

1P33: Generation of Ultrashort Relativistic Electron Bunches (Electron Mirrors) with Super-Intense Laser Pulses
V.A. Cherepenin[1], V.N. Kornienko[1], V.V. Kulagin[2,3], and V.V. Valuev[4]
[1]Institute of Radio Engineering and Electronics RAS, Mohovaya 11, Moscow,125009, Russia
[2]Center for Advanced Accelerators, KERI, Changwon, 641-120, Republic of Korea
[3]Sternberg Astronomical Institute, Moscow State University, Universitetsky prospect 13, Moscow, 119899, Russia
[4]Federal Company "Astrophysica", Volokolamskoye road.,95, Moscow,125424, Russia

1P34: Dynamics of Small Clusters Irradiated by Intense Laser Fields
G. M. Petrov, R. Clark, P. Kepple, A. Velikovich, and J. Davis
Naval Research Laboratory

1P35: Larmor Radiation from Magnetized Cluster Plasmas
Robert E. Terry, Robert W. Clark, and Jack Davis
Plasma Physics Division, Naval Research Library

1P36: Anomalous Skin Effect for Anisotropic Electron Velocity Distribution Function
Igor D. Kaganovich[1], Edward A. Startsev[1], and Gennady Shvets[2]
[1]Plasma Physics Laboratory, Princeton University, Princeton, New Jersey 08543, USA
[2]University of Texas at Austin, Institute for Fusion Studies, 1 University Place C1500, RLM 11.216, Austin, Texas 78712

1P37: Remote Atmospheric Breakdown Using Intense Femtosecond Laser Pulses
A. Ting[1], I. Alexeev[2], D. Gordon[1], E. Briscoe[3], J. Penano[1], R. Hubbard[1], and P. Sprangle[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington DC 20375
[2]National Research Council Research Associate at the Naval Research Laboratory
[3]RSI Inc., Lanhma, MD

1P38: Features of Nanosecond Laser-Induced Optical Breakdown at Air-Water Interface
A.O. Bukin, I.G. Nagorniy, F.P. Yarovenko, S.S. Golik, V.I. Tsarev, and A.N. Pavlov
Laboratory of Laser Spectroscopy, Far Eastern National University, Vladivostok, Russia

1P39: Study of Laser Plasmas in Straight Magnetic Fields for Thin Film Deposition
H. Sang[1], R. Rankin[2], and Y.Y. Tsui[1]
[1]Department of Electrical and Computer Engineering, University of Alberta
Edmonton, Alberta, Canada T6G 2V4
[2]Department of Physics, University of Alberta Edmonton, Alberta, Canada T6G 2G7

1P40: Physics of Laser Ablation Plasma Plumes for Deposition of Diamond-Like Carbon Films Under Magnetized and Field-Free Conditions
J.D. Haverkamp[1], M.A. Bourham[1], and J. Narayan[2]
[1]Department of Nuclear Engineering, North Carolina State University, Raleigh, NC
[2]Deartment of Material Science and Engineering, North Carolina State University, Raleigh, NC

1P41: Plume Expansion of Pulsed Laser Ablated Zinc Oxide
Travis K. Gray[1], Jagdish Narayan[1], and Mohamed A. Bourham[2]
[1]Department of Materials Science and Engineering, North Carolina State University,
Raleigh, NC 27695-7916
[2]Department of Nuclear Engineering, North Carolina State University, Raleigh, NC 27695-7909

Poster Session 1P42-51: Pulsed-Power Applications of Plasmas - I

1P42: Arc Switch Modeling with Complex-Impedance Loads
C.J. Buchenauer
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque,
New Mexico

1P43: Modeling of Experiments for Measuring Dynamic Arc Impedance
C.J. Buchenauer
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque,
New Mexico

1P44: A Conduction Model for Subnanosecond Breakdown Gas Switch
J.H. Chen, C.J. Buchenauer, and J.S. Tyo
Electrical and Computer Engineering Department, University of New Mexico, Albuquerque, NM 87131

1P45: Modelling the Pulsed Power, Inductive Voltage Adder, Machine: PIM, Using a Transmission Line Code
Aled Jones, Ken Thomas, Mark Williamson, and Stephen Clough,
Atomic Weapons Establishment, Aldermaston, UK

1P46: 3-D LSP Simulations of the PIM Induction Cell
K.J. Thomas[1], M.C. Williamson[1], M.J. Phillips[1], S.G. Clough[1], A. Jones[1],B.V. Oliver[2] J.E. Maenchen[3]
[1]AWE, Aldermaston, Berkshire, UK
[2]MRC, Albuquerque NM, USA
[3]Sandia National Laboratory, Albuquerque NM, USA

1P47: Particle-In-Cell-Simulation Rescaling of Magnetically Insulated Flow Theory
P.F. Ottinger and J.W. Schumer
Plasma Physics Division, Naval Research Laboratory Washington, DC 20375

1P48: Status on the Sphinx Generator Developed at 'Centre d'Etudes de Gramat' for Production of Soft X-Ray Radiation

C. Mangeant, B. Roques, R. Cadiergues, F. Bayol, F. Lassalle, J.P. Bedoch, J.L. Boyer, J.F. Cambonie, Y. Cazal, T. Chanconie, P. Combes, J.M. Delchie, R. Lample, S. Laspalles, A. Morell, S. Ritter, G. Rodriguez, L. Saule, and J.C. Thomas
Centre d'Etudes de Gramat, 46500 Gramat, France

1P49: Tabletop Multi-Mode Z-Pinch X-Ray Source "Sparky"

V. Kantsyrev[1], D. Fedin[1], M.E. Savage[2], R.A. Sharpe[3], W. Cline[1], D. Meredith[1], W. Weaver[1], V. Nalajala[1], S. Pokala[1], I. Shrestha[1], and D. Brown[1]
[1]The Physics Department of the University of Nevada, Reno
[2]SandiaNational Laboratories, Albuquerque, New Mexico 87185
[3]Ktech Corporation, Albuquerque, NM

1P50: Research of Capillary Z Pinch Extreme-Ultraviolet Light Source

Inho Song, Mitsuo Okamoto, Keita Kitade, Majid Masnavi, Yasushi Hayashi, Masato Watanabe, Akitoshi Okino, Koichi Yasuoka, Kazuhiko Horioka, Eiki Hotta
Department of Energy Science, Tokyo Institute of Technology, Nagatsuta, Midori-ku, Yokohama 226-8502, Japan

1P51: Investigation of High-Voltage Water-Switch Breakdown Using Laser Probing Diagnostics

G.S. Sarkisov[1], J.R. Woodworth[2], S.E. Rosenthal[2], J. Elizondo-Decanini[2]
[1]Ktech Corporation, Albuquerque, NM 87123
[2]Sandia National Laboratories, Albuquerque, NM 87185

1:30 Monday, June 28, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Antonio Ting, Naval Research Laboratory

Plenary Talk - PL2:

Laser Wakefield Accelerators: Status and Future

Wim Leemans
Lawrence Berkeley National Laboratory

3:00 Monday, June 28, 2004 **Constellation Ballroom C**

Chairperson: Antonio Ting, Naval Research Laboratory

Oral Session 2A: Laser-Driven and Plasma-Based Accelerators

2A1: Optical Injection in a Laser Wake Field Accelerator
D. Kaganovich[1], A. Ting[2], D. Gordon[2], T. G. Jones[2], E. Eldridge[3], R.Hubbard[2], and P. Sprangle[2]
[1]LET Corporation, Washington, DC
[2]Plasma Physics Division Naval Research Laboratory, Washington DC 20375
[3]RSI Inc., Lanham, MD

2A2: Radiation Generation from Plasma-Based Accelerators
E. Esarey[1], C.B. Schroeder[1], B.A. Shadwick[1], J. van Tilborg[2], C.G.R. Geddes[1], C. Toth[1], and W.P. Leemans[1]
[1]L'OASIS Group, Lawrence Berkeley National Laboratory
[2]Univiersity of California, Berkeley, CA 94720

2A3-4: Plasma Accelerators in the 1000 GHz Regime; Electromagnetic-Beat- and Beam-Driven Structures
C.E. Clayton[1,2], C.V. Filip[1], C. Joshi[1,2], K.A. Marsh[1,2], P. Musumeci[3], R. Narang[1], C. Pellegrini[3], J.B. Rosenzweig[3], S.Ya Tochitsky[1], R.B. Yoder[3], C.D. Barnes[4], B.E. Blue[2], F.-J. Decker[4], S. Deng[5], P. Emma[4], M.J. Hogan[4], C. Huang[2], R. Iverson[4], D.K. Johnson[2], T. Katsouleas[5], P. Krejcik[4], S. Lee[5], W.B. Mori[2,3], P. Muggli[5], C.L. O'Connell[4], E. Oz[5], R.H. Siemann[4], D. Walz[4], and S. Wang[2]
[1]Department of Electrical Engineering, University of California at Los Angeles, Los Angeles, CA 90095
[2]Department of Electrical Engineering, UCLA
[3]Department of Physics, University of California at Los Angeles, Los Angeles, CA 90095
[4]Stanford Linear Accelerator Center, Stanford, CA 94309, USA
[5]University of Southern California. Los Angeles, CA 90089, USA

2A5: Plasma Beatwave Accelerator Based on a Nonlinear Bistability of Relativistic Plasma Waves.
Gennady Shvets, Mikhail Tushentsov, and Sergey Kalmykov
The University of Texas at Austin

2A6-7: Guiding of Intense Pulses in Fully Ionized Hydrogen Plasma Waveguides from a Cluster Jet
H.M. Milchberg, V. Kumarappan, and K.Y. Kim
Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742

2A8: Trapping and Acceleration of Nonideal Injected Electron Bunches in Laser Wakefield Accelerators
R.F. Hubbard[1], D.F. Gordon[1], J.H. Cooley[2], B. Hafizi[1], T.G. Jones[1], D. Kaganovich[4], P. Sprangle[1], A. Ting[1], T.M. Antonsen, Jr.[2], and A. Zigler[3]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC
[2]IREAP, University of Maryland, College Park, MD
[3]Icarus Research, Inc., Bethesda, MD
[4]LET Corp., Washington, DC

2A9-10: Staged Electron Laser Acceleration (STELLA) and Application to Laser Wakefield Acceleration
W. D. Kimura
STI Optronics, Inc.

3:00 Monday, June 28, 2004 **Constellation Ballroom D**

Chairperson: Thomas Jarboe, University of Washington

Oral Session 2B: Magnetic Fusion Energy, Alternate Concepts

2B1-2: Spheromak Energy Confinement in Sustained and Transient Conditions
Carl R. Sovinec[1], Giovanni A. Cone[1], and Bruce I. Cohen[2]
[1]University of Wisconsin-Madison
[2]Lawrence Livermore National Laboratory

2B3: Recent Results from the HIT-SI Spheromak
P.E. Sieck, W.T. Hamp, V.A. Izzo, T.R. Jarboe, B.A. Nelson, R.G. O'Neill, A.J. Redd, and R.J. Smith
University of Washington

2B4: Diagnostic Upgrades on the Maryland Centrifugal Experiment (MCX)
A. Case, A. DeSilva, R. Ellis, R. Elton, J. Ghosh, H. Griem, A. Hassam, Y. Huang, R. Lunsford, R. McLaren, S. Messer, J. Rodgers, C. Teodorescu,
IREAP, University of Maryland, College Park, MD

2B5: Development of a Plasma Gun for Application in MTF: The LICA (Linearly Injected Coaxial Accelerator)
J. Harrison, I. Shinton, M.A. Thelen, and G. Dingley
Institute of Fundamental Sciences, Massey University Albany, New Zealand

2B6: Deformable Contact Liner Implosion Performed with 8 cm Diameter Electrode Apertures
J.H. Degnan[1], D. Amdahl[1], A. Brown[2], T. Cavazos[3], S.K. Coffey[2], G.G. Craddock[2], M.H. Frese[2], S.D. Frese[2], D. Gale[3], T.C. Grabowski[3], G.F. Kiuttu[1], F.M. Lehr[1], J.D. Letterio[1], R.E. Peterkin[1], Jr., N.F. Roderick[4], E.L. Ruden[1], R.E. Siemon[5], W. Sommars[3], and P.J. Turchi[1]
[1]Directed Energy Directorate, Air Force Research Laboratory, Kirkland AFB, NM, USA
[2]NumerEx, Albuquerque, NM, USA
[3]SAIC, Albuquerque, NM, USA
[4]Department of Chemical and Nuclear Engineering, University of New Mexico, Albuquerque, NM, USA
[5]University of Nevada Reno, Nevada, USA

2B7: MEIEC (Microwave Enhancement of Inertial Electrostatic Confinement) of Plasma for Fusion: Theory and Experiment
J.E. Brandenburg[1], Marin Racic[1], Lee Caraway[2], and Brian Wright[2]
[1]Florida Space Institute
[2]Florida Institute of Technology

2B8: Anomalous Electron Thermal Diffusivity due to the Electron Temperature Gradient Mode in Tokamaks
A. Hirose
Plasma Physics Laboratory, Univ. of Saskatchewan Saskatoon, Canada

3:00 Monday, June 28, 2004 **Constellation Ballroom E**

Chairperson: Costel Biloiu, West Virginia University

Oral Session 2C: Space Plasmas

2C1: Ion Temperature Imaging of the Earth's Magnetosphere
Earl Scime
Department of Physics, University of West Virginia

2C2: Amplification of Whistler Waves by Trapped Relativistic Electrons in the Magnetosphere
S.P. Kuo[1], Paul Kossey[2], Steven S. Kuo[3], and James T. Huynh[4]
[1]Department of Electrical & Computer Engineering, Polytechnic University, Six MetroTech Center, NY 11201
[2]Air Force Research Laboratory, AFRL/VSBX, Hanscom AFB, MA 01731
[3]Northrop Grumman Space Technology, One Space Park, Redondo Beach, CA 90278
[4]Raytheon Space & Airborne Systems, El Segundo CA 90245

2C3: Laboratory Investigation of the Propagation and Ducting of Whistler-Waves
W. E. Amatucci, G. Ganguli, D. N. Walker, and G. Gatling
Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

2C4: Experiment to Demonstrate the Auroral Kilometric Radiation Cyclotron Maser Instability
D.C. Speirs[1], K. Ronald[1], A.D.R. Phelps[1], R. Bingham[1,2], B.J. Kellett[2], and R.A. Cairns[3]
[1]Department of Physics, University of Strathclyde, Glasgow, Scotland, G4 0NG, U.K.
[2]Rutherford Appleton Laboratory, Chilton, Didcot, Oxon, England, OX11 0QX, U.K.
[3]University of St. Andrews, Fife, Scotland, KY16 9SS, U.K

2C5-6: Energetic Neutral Atom Imaging at Jupiter and Saturn; Results from the Cassini/MIMI Instrument
Donald G. Mitchell
Affiliation/Institution/Company: The Johns Hopkins University Applied Physics Laboratory

2C7: Comparison of Natural Narrow-Banded Emissions and Sounder Stimulated Resonances in the Magnetosphere of Jupiter Observed with the Ulysses Spacecraft
J. Fainberg[1], V.A. Osherovich[2], R.F. Benson[1], and R.J. Macdowall[1]
[1]NASA/Goddard Space Flight Center, Greenbelt, MD
[2]L3 Comm/Goddard Space Flight Center, Greenbelt, MD

2C8: A Laboratory Model of the Harris Magnetic Field
D.N. Walker[1], J.H. Bowles[2], W.E. Amatucci[1], D.L Holland[3], and J. Chen[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
Remote Sensing Division, Naval Research Laboratory, Washington, DC 20375
Department of Physics, Illinois State University, Normal, IL

3:00 Monday, June 28, 2004 **Constellation Ballroom F**

Chairperson: Trevor Moeller, InnovaTek

Oral Session 2D: Non-Equilibrium Plasma Processing - I

2D1-2: Plasma-Surface Interactions of Nanoporous Silica During Plasma-Based Pattern Transfer Using C_4F_8 and C_4F_8/Ar Gas Mixtures
Xuefeng Hua[1], Christian Stolz[1], G. S. Oehrlein[1], P. Lazzeri[2], N. Coghe[2], M. Anderle[2], C. K. Inoki[3], T. S. Kuan[3], and P. Jiang[4]
[1]Department of Physics, Department of Materials Science and Engineering, and Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, Maryland 20742
[2]ITC-irst, Center for Scientific and Technological Research, 38050 Povo, Trento, Italy
[3]Department of Physics, University at Albany, SUNY, Albany, N.Y. 12222
[4]Texas Instruments, Inc., Dallas, TX, USA

2D3: Investigation of Surface Modifications of 193 nm and 248 nm Photoresist Materials During Low-Pressure Plasma Etching
L. Ling[1], X. Hua[1], X. Li[1], G.S. Oehrlein[1], E.A. Hudson[2], P. Lazzeri[3], and M. Anderle[3]
[1]Department of Material Science and Engineering and Institute for Research in Electronics and Applied Physics University of Maryland, College Park, Maryland, 20742
[2]Lam Research Corp., 4650 Cushing Pkwy., Fremont CA 94538
[3]ITC-irst, Center for Scientific and Technological Research, Via Sommarive 18, Povo, Trento, Italy

2D4: Atmospheric Plasma Deposition of Abrasion Resistant Coatings on Plastic
Gregory Nowling[1], Steve Babayan[2], Xiawan Yang[1], Maryam Moravej[1], Melanie Yajima[1], Robert Hicks[1], and William Hoffman[3]
[1]Chemical Engineering Department, University of California, Los Angeles, CA 90095
[2]Surfx Technologies LLC, 3617 Hayden Avenue, Culver City, CA 90232
[3]Motorola Advanced Technology Center, 1301 E. Algonquin Road, Schaumburg, IL 60196

2D5: H_α Emission as a Plasma Vapor Deposition Control Sensor for Tribological, Diamond-Like Carbon Coatings
C.C. Klepper[1], E.P. Carlson[1], R.C. Hazelton[1] and E.J. Yadlowsky[1], M. A. Taher[2], and B. Feng[2]
[1]HY-Tech Research Corp.
[2]Caterpillar Inc.

2D6: Simultaneous, Multilayer Plasma Etching and Deposition of Fluorocarbon Layers on Silicon
Barbara Abraham-Shrauner
Washington University

2D7: Processing with LAPPS
D. Leonhardt[1], C. Muratore[2], and S.G. Walton[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]NRL/ASEE Postdoctoral Research Fellow

2D8: Non-Thermal Plasma BioPrinter with Nano-Scale Precision
Gregory Fridman, Mengyan Li, Gary Friedman, Alexander Gutsol, Peter I. Lelkes, and Alexander Fridman
Drexel Plasma Institute, Drexel University, Philadelphia, USA

2D9: Synthesis of Platinum-Loaded Zirconia on Fecralloy .Using Composite Plasma-Polymerized Films
P. D. Pedrow[1], R. Dhar[1], T.M. Moeller[2], Q. Ming[2], K.C. Liddell[3]and M.A. Osman[1]
[1]School of EECS, Washington State University Pullman, WA 99164
[2]InnovaTek, Inc. 350 Hills Street, Suite 104 Richland, WA 99352
[3]Department of Chemical Engineering, Washington State University Pullman, WA 99164

3:00 Monday, June 28, 2004 **Constellation Ballroom A**

Poster Session 2P1-11: Slow-Wave Devices - I

2P1: Sensitivity of Harmonic Injection and its Spatial Evolution for Nonlinear Distortion Suppression in a TWT
A. Singh, J.E. Scharer, J.G. Wöhlbier, and J.H. Booske
Electrical and Computer Engineering Dept., University of Wisconsin, Madison, 53706

2P2: Field Theory of a Smith-Purcell Traveling Wave Tube
H.P. Freund[1] and T.M. Abu-Elfadl[2]
[1]Science Applications International Corp., McLean, Va.
[2]Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD 20742

2P3: New 2.5D Code for Simulation of Nonliear Multisignal Amplification in a Wideband Helix TWT
A.S. Pobedonostsev[1], A.G. Rozhnev[2], S.A. Rumyantsev[1], N.M. Ryskin[2], D.V. Sokolov[2], D.I. Trubetskov[2], and V.B. Khomitch[1]
[1]SPRC Istok, Fryazino, Moscow reg. 141120, Russia
[2]Saratov State University, Saratov 410012 Russia

2P4: Development of Simple Nonlinear Analysis Code for Helix Traveling Wave Tube (SINCOHET)
Y.D. Joo[1], A.K. Sinha[2], and G.S. Park[1]
[1]School of Physics, Seoul National University, Seoul 151-742, Korea
[2]Central Electronics Engineering Research Institute, Pilani 333-031, India

2P5: Phase Velocity Measurements on a Broadband TWT
K.G. McLaughlin, J.H. Booske, and J.E. Scharer
Department of Electrical and Computer Engineering, University of Wisconsin, Madison, 53706

2P6: Plasma Focused Electron Beam for the Pasotron
J.P. Verboncoeur[1], Y. Carmel[2], G.S. Nusinovich[2], A.G. Shkvarunets[2], and Y. Bliokh[3]
[1]Dept. NE, Univ. of California, Berkeley, CA 94720-1730
[2]Univ. of Maryland, College Park, MD 20852-3511
[3]Technion, Israel Institute of Technology, Haifa, Israel

2P7: 3D PIC Simulation of Loaded Q Effects on CW Magnetron Performances
Sun-Shin Jung, Yun-Sik Jin, and Hong-Sik Lee
Korea Electrotechnology Research Institute, Seongju dong 28-1, Changwon, Korea 641-120

2P8: Three-Dimensional Particle-In-Cell (PIC) Simulations of a Conventional, Strapped, Oven Magnetron, Including the Effect of Periodic Variations in the Insulating Magnetic Field
J.W. Luginsland[1], M.H. Frese[1], J.J. Watrous[1], Y.Y. Lau[2], R.M. Gilgenbach[2], V.B. Neculaes[2], and M.C. Jones[2]
[1]NumerEx, 2309 Renard Place SE, Suite 220, Albuquerque, NM 87106
[2]University of Michigan, Department of Nuclear Engineering and Radiological Sciences

2P9: Simulation of 2.45 GHz Magnetron Oscillator†
Thomas E. Ruden[1], George E. Dombrowski[2], and David Hobbs[3]
[1]24 Mountfort Road, Newton Highlands, MA 02461
[2]69 Birchwood Heights Road, Storrs, CT 06268
[3]145 Washington Street, Belmont, MA 02478

2P10: Highly Tunable High Average Power Magnetron
Richard S. Smith III[1], Lars D. Ludeking[1], David Hobbs[1], and Tyler Gray[1], Tony Wynn[2], and Ron Lentz[2]
[1]Mission Research Corporation
[2]California Tube Laboratory

2P11: Investigtion of an X Band Experiemntal Magnetron Through MAGIC Modelling
L. Ma[1], X. Chen[1], M. Esterson[2], P.A. Lindsay[1], P. Burleigh[2], K. Saleem[2], and D.Wilson[2]
[1]Dept. of Electronic Eng., Queen Mary College, University of London, Mile End Road, London, E1 4NS, UK
[2]E2V Technologies, Chelmsford, Essex CM1 2QU, UK

Poster Session 2P12-25: Intense Electron and Ion Beams - I

2P12: The Physics and Validation of the Cygnus Radiographic Source for Armando
M. Berninger[1], T. Kwan[2], L. Yin[2], S. Lutz[1], B. DeVolder[2], and K. Bowers[2]
[1]Bechtel Nevada, Los Alamos Operations
[2]Los Alamos National Laboratory

2P13: Analysis of Rod-Pinch-Like Radiography Sources on a Compact Pulsed Power Generator
F.C.Young[1], G. Cooperstein[2], R.J. Allen[2], D.D. Hinshelwood[2], and J.W. Schumer[2]
[1]Titan/Jaycor, Reston, VA 20191
[2]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

2P14: Characterization of the 20-T Immersed Diode on RITS-3
Dean Rovang[1], Steve Cordova[1], Kelly Hahn[1], John Maenchen[1], Isidro Molina[1], Salvador Portillo[1], Bryan Oliver[2], Dave Rose[2], Dale Welch[2], Graham Cooper[3] and John McLean[3]
[1]Sandia National Laboratories, PO Box 5800, Albuquerque, NM 87185-1193 USA
[2]Mission Research Corporation, Albuquerque, NM 87110-3946 USA
[3]AWE, Aldermaston, RG7 4PR, UK

2P15: Effect of Plasma Dynamics on Impedance Behavior in Magnetically Immersed Diodes
D.R. Welch[1], D.V. Rose[1], B.V. Oliver[1], and D. Rovang
[1]Mission Research Corp., Albuquerque, NM
[2]Sandia National Laboratories, Albuquerque, NM

2P16: Simulations of the Pinch Dynamics in a Planar Self-Magnetically Pinched Diode
S.B. Swanekamp[1], G. Cooperstein[2], J.W. Schumer[2], D. Mosher[1], and P.F Ottinger[2]
[1]Titan/Jaycor, Reston, VA 20191
[2]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

2P17: Plasma Evolution In Self-Magnetic-Pinch Diodes
D.V. Rose[1], D.R. Welch[1], J. Threadgold[2], S. Portillo[3], S.B. Swanekamp[4], S. Strasburg[5], and D.D. Hinshelwood[6]
[1]Mission Research Corp., Albuquerque, NM
[2]AWE, Aldermaston, UK
[3]Sandia National Laboratories, Albuquerque, NM
[4]Titan/Jaycor, Reston VA
[5]National Research Council Research Associate at the Naval Research Laboratory
[6]Naval Research Laboratory, Washington, DC

2P18: The Potential of the Paraxial Diode as a Focussing Element for X-Radiography
D. Short[1], J. O'Malley[1], G. Cooper[1], J. Mclean[1], and B.V. Oliver[2]
[1]Atomic Weapons Establishment, Aldermaston. UK
[2]Mission Research Corp., Albuquerque, NM USA

2P19: Initial Findings For Paraxial Diode Shielding Studies On RITS-3
Graham Cooper[1], John McLean[1], and Stephen Clough[1], Dean Rovang[2], Kelly Hahn[2], John Maenchen[2], Isidro Molina[2], and Salvador Portillo[2]
[1]Atomic Weapons Establishment, Aldermaston, RG7 4PR, UK
[2]Sandia National Laboratories, PO Box 5800, Albuquerque, NM 87185-1193 USA

2P20: Experiments and Modeling of Intense Charged-Particle Beam Transport Cells
S. Strasburg, D. D. Hinshelwood, J. W. Schumer, D. Mosher, P. F. Ottinger
Plasma Physics Division, Naval Research Laboratory

2P21: Plasma-Filled Focusing Cells for Paraxial Diodes on RITS-3
K. Hahn[1], J. E. Maenchen[1], S. Cordova[1], I. Molina[1], E. Schamiloglu[2], D.R. Welch[3], B.V. Oliver[3], and D.V. Rose[3]
[1]Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185-1193 USA
[2]Department of Electrical and Computer Engineering, MSC01 11001 University of New Mexico, Albuquerque, NM 87131-0001 USA
[3]Mission Research Corporation, 5001 Indian School Road NE, Albuquerque, NM 87110-3946 USA

2P22: Radiographers Equations for Megavolt Electron Beams
Ian Crotch
AWE Aldermaston, Reading, Berks, England, RG7 4PR

2P23: Kinetic Simulations of an Electron Beam Penetrating a Denisty Gradient
A.G. Sgro
Los Alamos National Laboratory

2P24: Pre-Pulse Reduction on the Eros Accelerator at AWE
Mark Sinclair, Jim Threadgold, Ian Crotch, Martin Phillips, Andy Hamlett, Garry Jeffries, and Kevin Webb
Pulsed Power Group, AWE Aldermaston, Reading, RG7 4PR, UK

2P25: Spot Size Reduction on Radiographic Devices
A. Compant La Fontaine
Département de Physique Théorique et Appliquée, CEA/DAM Ile-de France, BP12–F 91680, Bruyères-le-Châtel, France

Poster Session 2P26-41: Fast Z-Pinches, X-Ray Lasers, and Dense Plasma Focus - I

2P26: Preliminary Results on X-Ray Lithography Using a Compact Plasma Focus
G.. X. Zhang[1], L. Liu[1], C.M. Luo[1], S. Lee[2], P. Lee[2], and M.H. Liu[2]
[1]Tsinghua University
[2]Nanyang Technological University

2P27: Bifurcation of Current Within Gas Puff Z-Pinches
Andrew Wilson[1] and Paul Steen
[1]Avonia Inc., 13631 Old El Camino Real, San Diego, CA 92130
[2]Titan Corporation, Pulse Sciences Division, 3033 Science Park Road, San Diego, CA 92121

2P28: Survey of Design Points for Low Wire Count PRS Loads
Robert E. Terry and John P. Apruzese
Plasma Physics Division, Naval Research Laboratory

2P29: Structure in Mixed Element Plasmas on the Z-Accelerator at Sandia National Laboratories
P.D. LePell[1], C.A. Coverdale[2], C. Deeney[2], and Y. Maron[3]
[1]Ktech Corporation
[2]Sandia National Laboratories
[3]The Weizmann Institute

2P30: Modeling Shell-on-Cylinder Implosions on the Z and ZR Pulsed-Power Generators
K.G. Whitney[1], J.W. Thornhill[1], A.L. Velikovich[1], J. Davis[1], C.A. Coverdale[2], and C. Deeney[2]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC
[2]Sandia National Laboratories, Albuquerque, NM

2P31: Three-Dimensional ALEGRA-HEDP Simulations of Modulated Wire Arrays on MAGPIE
Christopher J. Garasi[1], Christopher Deeney[1], Brent Jones[1], Thomas A. Mehlhorn[1], Allen C. Robinson[1], Scott E. Wunsch[1], Bryan V. Oliver[2], David Ampleford[3], Simon N. Bland[3], Simon Bott[3], and Sergey V. Lebedev[3]
[1]Sandia National Laboratories; [2]Mission Research Corporation, Albuquerque, NM;
[3]Blackett Laboratory, Imperial College

2P32: High Opacity Effects in Multi-Milligram Aluminum Wire Array Implosions
C. Deeney[1], T.J. Nash[1], P.D. LePell[1], C.A. Coverdale[1], B.M. Jones[1], Y. Maron[2], J.W. Thornhill[3], K.G. Whitney[3], J.P. Apruzese[3], J. Davis[3], and J. Chittenden[4]
[1]Sandia National Laboratories, PO Box 5800, Albuquerque, NM 87185, USA
[2]Weizmann Institue, Rehevot, Israel
[3]Naval Research Laboratory, Washington, DC 20375, USA
[4]Imperial College, London, UK

2P33: Spectroscopic Measurements of X-Ray Line Emission from Brass X Pinches
K.M. Chandler[1], M.D. Mitchell[1], T.A. Shelkovenko[2], S.A. Pikuz[2] and D.A. Hammer[1]
[1]Laboratory of Plasma Studies, Cornell University, Ithaca, NY 14853 USA
[2]P. N. Lebedev Institute, Moscow, Russia

2P34: Ablation Dynamics of a Single Wire with Closely Coupled Return Current
M.D. Mitchell[1], S. V. Lebedev[2], S.A. Pikuz[3], T.A. Shelkovenko[3], and D.A. Hammer[1]
[1]Laboratory of Plasma Studies, Cornell University, Ithaca, NY 14853USA
[2]Physics Department, Imperial College, London, UK
[3]P.N. Lebedev Physical Institute, Moscow, Russia

2P35: Numerical Simulation of Electric Explosions of Metal Wires
V.I. Oreshkin[1], R.B. Baksht[1], A.Yu. Labetsky[1], N.A. Ratakhin[1], A.G. Rousskikh[1], A.V. Shishlov[1], P.R. Levashov[2], K.V. Khishchenko[2], I.V. Glazyrin[3], and I. Beilis[4]
[1]High Current Electronics Institute, SB RAS, Tomsk, Russia
[2]Institute for High Energy Densities, RAS, Moscow, Russia
[3]RFNC-Zababakhin Institute of Technical Physics, Snezhinsk, Russia
[4]Tel Aviv University, Tel Aviv, Israel

2P36: X pinches in Special Configurations
S.A. Pikuz[1], D.A. Hammer[2], T.A. Shelkovenko[1], K.M. Chandler[2] and M.D. Mitchell[2]
[1]P. N. Lebedev Institute, Moscow, Russia
[2]Laboratory of Plasma Studies, Cornell University, Ithaca, NY 14853 USA

2P37: Classification of the Nickel-like Silver Spectrum from a Fast Capillary Discharge Plasma
A. Rahman[1], J.J. Rocca[1,2], and J.-F. Wyart[3]
[1]Department of Electrical and Computer Engineering, Colorado State University. Fort Collins, CO 80523
[2]Department of Physics, Colorado State University. Fort Collins, CO 80523
[3]Laboratoire Aimé Cotton, CNRS (UPR 3321), Centre Universitaire, 91405-Orsay, France

2P38: Controlling Uniformity of Gas-Puff and Wire Array Implosions with Wire Current-Carrying Structures
A. L. Velikovich[1] and L.I. Rudakov[2]
[1]Plasma Physics Division, Naval Research Laboratory
[2]Berkeley Scholars, Inc., Springfiled, VA

2P39: Single and Multi-Wire Z-pinch Experiments to Study Wire Initiation and Coronal Plasma Structure
T.S. Strickler[1], M.D. Johnston[1], R.M. Gilgenbach[1], Y.Y. Lau[1], M.C. Jones[1], M.E. Cuneo[2] and T.A. Mehlhorn[2]
[1]University of Michigan
[2]Sandia National Laboratories

2P40: Linear Analysis of Magnetic and Flow Shear Stabilizition of Z-Pinch Instabilities
L.F. Wanex[1], V.I. Sotnikov[1], and J.N. Leboeuf[2]
[1]University of Nevada, Reno, NV 89557
[2]University of California, Los Angeles, CA 90095

2P41: Influence of External Media on the Resistance Stage of Heating of Thin Wires by High-Power Current Pulse
S.A.Pikuz[1], T.A.Shelkovenko[1], A.V.Agafonov[1], S.Yu. Guskov[1], G.V.Ivanenkov[1], A.R.Mingaleev[1], V.M.Romanova[1], A.E.Ter-Oganesyan[1], C.I. Tkachenko[2]
[1]P.N. Lebedev Physical Institute, 53 Leninskii prospect, 119991 Moscow, Russia
[2]Institute of High Energy Densities, 13/19 Izhorskaya, 125212 Moscow, Russia

Poster Session 2P42-60: Medical, Biological, and Environmental Applications - I

2P42: Sterilization in Plexy Glass Tube by Microwave
Selcuk Helhel[1], Lutfi Oksuz[1], Osman Cerezci[2], Abbas Yousefi Rad[3]
[1]S.Demirel University, Department of Physics, Isparta Turkey
[2]Sakarya University, Department of Electronics, Adapazari, Turkey
[3]S.Demirel University, Department of Biology, Isparta Turkey

2P43: Frequency Dependence of Electroporation of Mammalian Cells by Pulsed High Power Radiofrequency and Ultrawideband Radiation
D.W. Jordan[1], A.L. Garner[1], R.M. Gilgenbach[1], M.D. Uhler[2], L. Gates[2], and Y.Y. Lau[1]
[1]Bioelectromagnetism Laboratory, Nuclear Engineering and Radiological Sciences Dept., University of Michigan, Ann Arbor, Michigan, 48109
[2]Mental Health Research Institute, Medical School, University of Michigan, Ann Arbor, Michigan, 48109

2P44: Altering Dielectric Properties of Human Cancer Cells by Varying Electrical Pulse Durations
A.L. Garner[1,2], J. Yang[1], N. Chen[1], J. Kolb[1], K.C. Loftin[1], R.J. Swanson[1], S. Beebe, R.P. Joshi[1], and K.H. Schoenbach[1]
[1]Center for Bioelectrics, Old Dominion University, Norfolk, Virginia 23510
[2]Department of Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, Michigan 48109

2P45: Evidences For Membrane Electroporation During Application Of Nanoseconds Electrical Pulses
C. Gusbeth, W. Frey, and H. Bluhm
Forschungszentrum Karlsruhe GmbH, Institute for Pulsed Power and Microwave Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany

2P46: Parameter Studies on the Electroporation Efficiency of Sugar Beets
M. Sack, Chr. Schultheiss, and H. Bluhm
Forschungszentrum Karlsruhe GmbH, Institute for Pulsed Power and Microwave Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany

2P47: Temporal Observation of Apoptosis in Tumor Tissues via Electrochemical Treatment (EchT)
Hong Bae Kim[1], Sungbo Sim[2], and Saeyoung Ahn[1,3]
[1]Solco BioMedical Institute
[2]Dept of Cardiac Surgery of Korea, Catholic Medical School
[3]College of Natural Sciences of Seoul National University, Seoul, Korea

2P48: Ambient Pressure Resistive Barrier Cold Plasma Discharge for Biological and Environmental Applications
Magesh Thiyagarajan[1], Igor Alexeff[1], Sriram Parameswaran[1] and Stephen Beebe[2]
[1]University of Tennessee, Knoxville, TN 37996-2100, USA; [2]Eastern Virginia Medical School, VA, USA

2P49: Specialized Non-Heating Chamber with Spatially Homogeneous Microwave Energy Distribution to Support DBD-Produced Remote Exposure Atmospheric Plasma Processing for Anti-Microbial Air Decontamination
S. V. Zhilkov, and V.S. Zhilkov
AccelBeam Photonics LLC, 201 Ironwood Circle, Elkins Park, PA 19027

2P50: Non-Thermal Plasma Applications in Air Sterilization
Michael J Gallagher, Alexander Gutsol, Alexander Fridman, Gary Friedman, and Alexander Dolgopolsky
Drexel Plasma Institute

2P51: Room Temperature Sterilization of Medical Devices with OAUGDP
S. South, D. Sherman, and K. Kelly-Wintenberg
Atmospheric Glow Technologies, Knoxville, TN

2P52: Analysis about Sterilization by Patterned Surface Discharge in Air
Jai Hyuk Choi and Hong Koo Baik
Department of Metallurgical Engineering, Yonsei University Seoul 120-749, Korea

2P53: Radical Kinetics Simulation for Transient Plasma Ignition for Fuel – Air Mixtures
C. Jiang[1], L.C. Lee[2], F. Wang[1], and M.A. Gundersen[1]
[1]University of Southern California, Los Angeles, CA 90089
[2]San Diego State University, San Diego, CA 92182

2P54: The Kill of Invasive Marine Species Using Advance Oxidation Technology
Xiyao Bai, Mindong Bai, Zhitao Zhang, and Bo Yang
Environmental Engineering Institute, Dalian Maritime University, Dalian 116026, Liaoning, P.R. China

2P55: Atmospheric Pressure Plasma Treated PLGA for Tissue Engineering
Inho Han, Joohyon Noh, In-seop Lee, and Hong Koo Baik
Department of Metallurgical Engineering, Yonsei University Seoul 120-749, Korea

2P56: Some Applications of Dense Gas Discharge with Runaway Electrons
Anatoly N. Maltsev, Dmitry A. Sankevich, Oxana G. Shaparev, and Sergey A. Chernyshov
Institute of Atmospheric Optics, Siberian Branch Russian Academy of Sciences

2P57: Effect of ns Pulsed X-Ray Irradiation on Biological Media
A. Khacef, R. Viladrosa, and J. M. Pouvesle
GREMI-Polytech'Orléans, 14 rue d'Issoudun, B.P. 6744, 45067 Orléans Cedex 2, France

2P58: Anti-Thrombotic Effect of Amorphous Hydrogenated Carbon (a-C:H) Films: Influence of Electron Structure
P. Yang[1,2], G.J. Wan[1], H. Sun[1], Y.X. Leng[1], N. Huang[1], Y. Leng[3], and P.K. Chu[2]
[1]Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Material Processing of Chinese Education Ministry. Southwest Jiaotong University, Chengdu, 610031, China
[2]Department of Physics and Materials Science, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon, Hong Kong
[3]Department of Mechanical Engineering, Hong Kong University of Science & Technology, Clear Water Bay, Kowloon, Hong Kong

2P59: Development of a Medical Implant Coating with Bioactive Glass for Temperature Sensitive Materials using a Pulsed Electron Beam Device
P. Brenner, L. Buth, Chr. Schultheiss, and H. Bluhm
Forschungszentrum Karlsruhe GmbH, Institute for Pulsed Power and Microwave Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany

2P60: New Missions for Z Pinches
J. S. De Groot[1,2] and T. Mehlhorn[2]
[1]Plasma Research Group, UC Davis
[2]Sandia National Laboratories

8:00 Tuesday, June 29, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Robert Reinovsky, Los Alamos National Laboratory

Plenary Talk - PL3:

The "Baikal" Project – Generating 10-MJ of X-Rays
for Inertial Confinement Fusion

Eugene Grabovski
Troitsk Institute for Innovation and Fusion Research

9:30 Tuesday, June 29, 2004 **Constellation Ballroom C**

Chairperson: Dale Welch, Mission Research Corporation

Oral Session 3A: Intense Electron and Ion Beams - I

3A1: Magnetically Immersed Diode Evaluation on the ASTERIX Generator Up to 7 MV
C. Vermare[1], Y. Horde[1], L. Magnin[1], E. Merle[1], R. Nicolas[1], M. Prat[1], R. Rosol[1], Y. Tailleur[1], M. Toury[1], F. Bayol[2], C. Delbos[2], A. Guarrigues[2], G. Nicot[2], G. Cooper[3], J. McLean[3], A. Critchley[3], and M. Sinclair[3]
[1]CEA-DAM, Polygone d'Experimentation de Moronvilliers, 51 490 Pontfaverger-Moronvilliers, France;
[2]DGA-CEG, 46 500 Gramat, France
[3]AWE Aldermaston, Berkshire, RG7 4RP, UK

3A2-3: Evaluation of Self-Magnetically-Pinched Diodes as High-Resolution, High-Voltage Radiography Sources
S.B. Swanekamp[1], G. Cooperstein[2], J.W. Schumer[2], D. Mosher[1], F.C. Young[1], P.F Ottinger[2], and R.J. Commisso[2]
[1]Titan/Jaycor, Reston, VA 20191
[2]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375

3A4: Self Magnetic Pinch Diode Experiments at 4 – 6 MV
Jim Threadgold[1], Ian Crotch[1], Mark Sinclair[1], Martin Philips[1], Salvador Portillo[2], John Maenchen[2], Christophe Vermare[3], and Frederic Bayol[4]
[1]AWE Aldermaston, Berkshire, RG7 4RP, UK
[2]Sandia National Labs, Albuquerque, NM, USA
[3]CEA / DAM, Moronvilliers, France; [4]CEG Gramat, France

3A5: Self-Magnetic-Pinched Diode Studies for Radiographic Applications
David Hinshelwood[1], G. Cooperstein[1], D. Mosher[2], D. M. Ponce[3], S. Strasburg[3], S.B. Swanekamp[2], S.J. Stephanakis[2], B. V. Weber[1], F.C. Young[2], A. Critchley[4], I. Crotch[4], and J. Threadgold[4]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC USA
[2]Titan/Jaycor, Reston ,VA
[3]National Research Council Research Associate at the Naval Research Laboratory
[4]AWE, Aldermaston, UK

3A6: Paraxial Gas-Cell Focusing of Relativistic Electron Beams for Radiography
B.V. Oliver[1] D. Short[2], G. Cooper[2], J. McClean[2] and J. O'Malley[2]
[1]Mission Research Corp., Albuquerque, NM USA
[2]Atomic Weapons Establishment, Aldermaston, Berks. U.K

3A7: Negative Polarity Plasma Filled Rod Pinch: Initial Experiments on GAMBLE II
D. M. Ponce[1], S.J. Stephanakis[2], F.C. Young[2], D.D. Hinshelwood[3], and B.V. Weber[3]
[1]National research Council Research Associate at the Naval Research Laboratory
[2]Titan/Jaycor, Reston, VA
[3]Plasma Physics Division, Naval Research Laboratory, Washington, DC

3A8: Design of the 10.5 MV, 123 kA RITS-6 Accelerator
V.L. Bailey[1], D.L. Johnson[1], P. Corcoran, I. Smith[1], J.E. Maenchen[2], D. Rovang[2], S. Portillo[2], I. Molina[2], K. Hahn[2], E. Puetz[2] B. Oliver[3], D. Rose[3], D. Welsh[3] D. Droemer[4], and T. Guy[4]
[1]Titan Pulse Sciences Division, San Leandro, CA 94577 USA
[2]Sandia National Laboratories, Albuquerque, NM 87185-1193 USA
[3]Mission Research Corporation, Albuquerque, NM 87110 USA
[4]Bechtel Nevada, Las Vegas, NV 89193-8521 USA

3A9: Directed Current Shedding Experiments from a Magnetically Insulated Transmission Line
Mark Sinclair, Paul Beech, Tim Bryant, Stephen Croxon, and Andrew Stevens
Pulsed Power Group, AWE Aldermaston, Reading, RG7 4PR, UK

3A10: Elimination of Artifacts in Megavolt X-Ray Focal-Spot Diagnosis
Gideon Barnea
Rafael, P.O. Box 2250, Haifa, 31021, Israel

9:30 Tuesday, June 29, 2004 **Constellation Ballroom D**

Chairperson: Juergen Kolb, Old Dominion University

Oral Session 3B: Medical, Biological, and Environmental Applications - II

3B1-2: Destruction of Environmental Air Contaminants in Non-Thermal, Atmospheric-Pressure Plasmas
A. Koutsospyros, S.-M. Yin, C. Christodoulatos, and K. Becker
Center for Environmental Systems (CES), Stevens Institute of Technology, Hoboken, USA

3B3: Reduction of Nitrogen Oxide Using Ammonia Radicals Prepared by Intermittent Dielectric Barrier Discharge
Kensuke Kawamura[1], Ken Yukimura[1], Shinji Kambara[2], Hiroshi Moritomi[2], and Toru Yamashita[3]
[1]Department of Electrical Engineering, Faculty of Engineering, Doshisha University, 1-3,Tatara-Miyakodani, Kyotanabe, Kyoto, 610-0321, JAPAN
[2]Department of Environmental Energy System, Gifu University, Gifu, Gifu 501-1193, Japan
[3]Coal Reseaarch Lab., Industrial Energy Department, Idemitsu Kosan Co.,LTD., 3-1 Nakasode, Sodegaura, Chiba 299-0267, Japan

3B4: Ozone Generation in an Atmospheric Pressure Micro- Plasma Jet in Air
A-A.H.Mohamed, S.Suddala, M.A.Malik, and K.H.Schoenbach
Center for Bioelectrics, Old Dominion University, 830 Southampton Ave., Suite 5100, Norfolk, VA 23510

3B5-6: Comparison of Catalytic Activity of Alumina and Silica Gel for Decomposition of Volatile Organic Compounds in a Plasmacatalytic Reactor
Muhammad Arif Malik, Yasushi Minamitani, and Karl H. Schoenbach
Center for Bioelectrics, Old Dominion University, 830 Southampton Ave., Suite 5100, Norfolk, VA 23510

3B7: Degradation of Aqueous Organic Pollutants in Hybrid Gas-Liquid Electrical Discharge Reactors
P. Lukes[1,2], W.C. Finney[1], and B.R. Locke[1]
[1]FAMU-FSU College of Engineering, Florida State University, 2525 Pottsdamer St., Tallahassee, FL 32310 USA
[2]Institute of Plasma Physics, Academy of Sciences of the Czech Republic, Za Slovankou 3, Prague 182 21, Czech Republic

3B8: Characteristics of Plasmas Produced in Water
H. Akiyama, K. Tanaka, S. Hongo, and S. Katsuki
Kumamoto University, Kumamoto, Japan

3B9: Survey on the Channel Spark Coating Method and Applications in Technique and Medicine
C. Schultheiss, P. Brenner, L. Buth, and H. Bluhm
Forschungszentrum Karlsruhe GmbH, Institute for Pulsed Power and Microwave Technology, P.O. Box 3640, D-76021 Karlsruhe, Germany

9:30 Tuesday, June 29, 2004 **Constellation Ballroom E**

Chairperson: John Booske, University of Wisconsin

Oral Session 3C: Slow-Wave Devices - I

3C1-2: Noise Reduction and Magnetic Priming for kW Magnetrons by Azimuthally Varying Axial Magnetic Fields
V.B. Neculaes, R.M. Gilgenbach, Y.Y Lau, M.C. Jones, W. White, N.M. Jordan, P. Pengvanich, Y. Hidaka and H. Bosman
Intense Energy Beam Interaction Lab, Nuclear Eng. and Radiological Sciences Dept., University of Michigan, Ann Arbor, MI 48109-2104

3C3: Multiple Beam Klystron Operation
A. Balkcum[1], E. Wright[1], H. Bohlen[1], M. Cattelino[1], L. Cox[1], M. Cusick[1], K Eppley[2], S. Forrest[1], F. Friedlander[1], A. Staprans[1], and L. Zitelli[1]
[1]Communications and Power Industries Inc., 811 Hansen Way, Palo Alto, CA USA 94303-0750
[2]Science Applications International Corporation, Boston, MA

3C4: Progress on a Multi-Beam Klystron for Accelerator Applications
C.B. Wilsen, M.F. Kirshner, R.J. Bartkowski, R.J. Hansen, L. Turek, T.A. Hargreaves, and R.B. True
L-3 Communications Electron Devices 960 Industrial Road, San Carlos, CA 94070

3C5: High-Power S-band Fundamental-Mode Eight-Beam Klystron and Gun Design
K.T. Nguyen[1], D.K. Abe[2], D.E. Pershing[3], B.Levush[2], E.L. Wright[4], M. Cusick[4], and M. Cattelino[4]
[1]Beam-Wave Research, Inc., Silver Spring, MD 20905
[2]Naval Research Laboratory
[3]Mission Research Corporation
[4]Communication and Power Industries

3C6: Progress on a Gridded Electron Gun for a Sheet Beam Klystron
M.E. Read, G. Miram, and R.L. Ives
Calabazas Creek Research, Inc., Saratoga, CA, 95070-3753

3C7: Design Analysis of Broadband Output Circuits For Klystron Amplifiers
Hemant A. Soman and Girish P. Saraph
Department of Electrical Engineering, Indian Institute of Technology, Bombay, Powai, Mumbai – 400076, India

3C8-9: High Efficiency Operation of a Plasma-Assisted Slow-Wave Microwave Oscillator at a MW Power Level
A. G. Shkvarunets[1], Y. Carmel[1], G. S. Nusinovich[1], T. M. Abuelfadl[1], J. Rodgers[1], T. M. Antonsen[1], Jr., V. Granatstein[1], Yuriy Bliokh[2], Dan M. Goebel[3], and John P. Verboncoeur[4]
[1]Univ. of Maryland, College Park, MD 20852-3511
[2]Technion, Israel Institute of Technology, Haifa, Israel
[3]Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109
[4]Univ. of California, Berkeley, CA 94720-1770

9:30 Tuesday, June 29, 2004 **Constellation Ballroom F**

Chairperson: Joachim Heberlein, University of Minnesota

Oral Session 3D: Thermal Plasma Chemistry and Processing - I

3D1-2: Understanding Suspension D.C. Plasma Spraying of Nanostructured Coatings.
Pierre Fauchais[1], Cedric Delbos[1], Jérôme Fazilleau[1], Jean-François Coudert[1], Vincent Rat[1], ,Luc Bianchi[2]
[1]Laboratoire Sciences des Procédés Céramiques et de Traitements de Surface (SPCTS), UMR-CNRS 6638, 123 Avenue Albert Thomas, 87060 limoges cedex, France
[2]Commisariat à l'Energie, le Ripault, DMAT/SDI/LPTH, BP 16, 37260 Monts, France

3D3: RF-Induction Plasma Synthesis of CeO_2-Based Fine Powders for SOFC Electrolytes
Ian Castillo and Richard J. Munz
Plasma Technology Research Centre (CRTP), McGill University

3D4: Production of Hydrogen and Carbon Black by Methane Decomposition Using DC-RF Hybrid Thermal Plasmas
K.S. Kim[1], J.H. Seo[1], J.S. Nam[1], W.T. Ju[2], K.H. Paek[2], and S.H. Hong[1]
[1]Seoul National University, Seoul 151-742, Korea; [2]PLASNIX Co., Ltd., Seoul 151-742, Korea

3D5: Two Modes of Cathode Spot Operation at High-Current High Pressure Arc
Valerian Nemchinsky
ESAB Welding and Cutting Products

3D6: Spectroscopic Measurements on an Oxygen Cutting Plasma
J. Peters[1], J. Heberlein[1], and J. Lindsay[2]
[1]University of Minnesota, Mechanical Engineering Minneapolis, MN 55455
[2]Hypertherm Inc. Hanover, NH 03755

3D7: Anode Attachment Stability and Anode Heat Fluxes for High Intensity Arcs With, Argon Nitrogen and Helium Gas Flow Parallel to the Anode.
T. Iwao[1], P. Cronin[2], D. Bendix[3], and J. Heberlein[2]
[1]Department of Electrical and Electronic Engineering, Musashi Institute of Technology, Tokyo, Japan
[2]Department of Mechanical Engineering, University of Minnesota, Minneapolis, USA
[3]Department of Engineering Sciences, Martin-Luther-University Halle-Wittenberg, Germany

3D8: Hybrid Stabilized Electric Arc: Numerical Study of the Performance Under Different Radiation Models
Jiri Jenista[1], Milada Bartlova[2], and Vladimír Aubrecht[2]
[1]Institute of Plasma Physics ASCR, Za Slovankou 3, 18221 Prague, Czech Republic
[2]Brno University of Technology, Technická 8, 616 00 Brno, Czech Republic

3D9: Temperature Measurements and Numerical Analysis of the Heat Transfer in Samples Submitted to Electron Discharge Machining (EDM)
B. Revaz[1], R. Flükiger[1], J. Carron[2], and M. Rappaz[2]
[1]Dept of Condensed Matter Physics, University of Geneva, CH-1204 Geneva
[2]Laboratoire de simulation des matériaux, EPFL, CH-1015 Lausanne

3D10: 3D Modeling of an Electrical Arc in Low Voltage Breaking Devices: Study of the Magnetic Forces
F. Baudoin, Y. Cressault, P. Checchin, C. Brdys, and A. Laurent
Laboratoire d'Electrotechnique de Montluçon, avenue Aristide, Briand, BP 2235, 03101 Montluçon Cedex, France

Constellation Ballroom A
9:30 Tuesday, June 29, 2004

Poster Session 3P1-8: Basic Phenomena - I

3P1: Langmuir Probe Interpretation for Plasmas with Secondary Electrons from the Wall
S. Robertson and Z. Sternovsky
Department of Physics, University of Colorado, Boulder, CO 80309-0390

3P2: The Study of Presheath Instabilities in Two Ion Species Plasmas
Xu Wang, Eunsuk Ko, and Noah Hershkowitz
Dept. of Engineering Physics, University of Wisconsin-Madison, Madison, WI 53706

3P3: Ion Flows in the Vicinity of a Plasma Limiting Aperture
Xuan Sun[1], E.E. Scime[1], M. Miah[2], and S.A. Cohen[2]
[1]West Virginia University
[2]Princeton Plasma Physics Laboratory

3P4: Comparison of Particle-in-Cell and Eletron-Boltzmann Hybrid Simulations for the Collisional Sheath of an Argon DC Discharge
Hae June Lee and Young Wook Choi
Korea Electrotechnology Research Institute (KERI), 28-1 Seongju-Dong, Changwon, 641-120, Republic of Korea

3P5: A Study of Interaction of Opposite As Well As of Same Polarity Solitons Via Computer Simulation
V.K. Sayal[1] and M.P. Srivastava[2]
[1]Sikkim Manipal Institute of Technology, Majitar, Rangpo, Sikkim, India0
[2]Department of Physics & Astrophysics, Delhi University, Delhi, India

3P6: Regular Method of Finding of Integrals of Collisions in Kinetic Equations
V.F. Tuganov
State Research Center, Troitsk Innovation and Fusion Research Institute, Russia

3P7: Electron Plasma In A Toroidal Penning Trap
S.Pahari[1], H.Ramachandran[2], and P.I.John[1]
[1]Institute For Plasma Research, Gandhinagar, India
[2]Indian Institute of Technology, Madras, India

3P8: Anomalous Paschen Effect
Predrag Osmokrovic[1], Boris Loncar[2], and Aleksandra Vasic[3]
[1]Faculty of Electrical Engineering, University of Belgrade, Serbia and Montenegro
[2]Faculty of Technology and Metallurgy, University of Belgrade, Serbia and Montenegro
[3]Faculty of Mechanical Engineering, University of Belgrade, Serbia and Montenegro

Poster Session 3P9-20: Partially Ionized Gases

3P9: Pulsed DBD at Atmospheric Pressure
M. Laroussi[1], X. Lu[1], V. Kolobov[2], and R. Arslanbekov[2]
[1]Old Dominion University, Norfolk, VA 23529
[2]CFD Research Corporation, Huntsville, AL 35805

3P10: Numerical Solutions to a Kinetic Model for Sheath and Presheath with Charge Exchange Collisions of Ions
K. Downum, Z. Sternovsky, and S. Robertson
Department of Physics, University of Colorado, Boulder, CO 80309-0390

3P11: Plasma and Electrical Characteristics of Inductive Discharge in Magnetic Field
V. A. Godyak and B. M. Alexandrovich
OSRAM SYLVANIA 71 Cherry Hill Drive, Beverly, MA 01915

3P12: Optical Diagnostic of Shock Wave Induced Double-Layers in the Afterglow of Non-Equilibrium Nitrogen Plasma
N. Siefert[1], D. Trump[2], P. Bletzinger[2], and B. Ganguly[1]
[1]Air Force Research Laboratory, Wright Patterson Air Force Base, Ohio 45433
ISSI, Dayton, Ohio 45440

3P13: Self-Consistent Kinetic Simulations of Inductively Coupled Low- Pressure Discharges
Oleg V. Polomarov[1], Constantine E. Theodosiou[1], and Igor D. Kaganovich[2]
[1]Department of Physics and Astronomy, University of Toledo, Toledo, Ohio 43606-3390
[2]Plasma Physics Laboratory, Princeton University, Princeton, New Jersey 08543, USA

3P14: Energy Generation and Transport in an Atmospheric Pressure, Audio Frequency Discharge
Travis K. Gray, Brian L. Bures, and Mohamed A. Bourham
Department of Nuclear Engineering, North Carolina State University, Raleigh, NC 27695-7909

3P15: Self-Consistent Modeling of in Dielectric-Barrier Atmospheric Plasmas
X.M. Zhu and M.G. Kong
Department of Electronic and Electrical Engineering, Loughborough University, Loughborough, LE11 3TU, UK

3P16: Scaling of Plasma Sources for $O_2(^1\Delta)$ Generation for Chemical Oxygen-Iodine Lasers
D. Shane Stafford[1] and Mark J. Kushner[2]
[1]Dept. Chemical and Biomolecular Engr., University of Illinois, 1406 W. Green St., Urbana, IL 61801 USA
[2]Dept. of Electrical and Computer Engr., University of Illinois, 1406 W. Green St., Urbana, IL 61801 USA

3P17: Kinetic Effects on the Radio-Frequency Sheath Dynamics
Nong Xiang and Frank Waelbroeck
Institute for Fusion Studies, University of Texas at Austin, Austin, TX 78712

3P18: Novel Technique for the Production of High-Pressure Air Constituent Plasmas
Kamran Akhtar, John E. Scharer, Mark Denning, and Siqi Luo
Electrical and Computer Engineering Department, University of Wisconsin-Madison 53706

3P19: Properties of a Non-Equilibrium Atmospheric Pressure Plasma
Xiawan Yang[1], Maryam Moravej[1], Gregory Nowling[1], Steve Babayan[2], Joel Penelon[2], and Robert Hicks[1]
[1]Chemical Engineering Department, University of California, Los Angeles, CA 90095
[2]Surfx Technologies LLC, 3617 Hayden Avenue, Culver City, CA 90232

3P20: Electron-Impact Excitation of Xenon
Arati Dasgupta[1], Klaus Bartschat[2], and Don Madison[3]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]Department of Physics and Astronomy, Drake University, Des Moines, IA 50311
[3]Physics Department, University of Missouri-Rolla, Rolla, MO 65401

Poster Session 3P21-34: Non-Equilibrium Plasma Processing - I

3P21: Ultra-Low-Energy BF3 Plasma Doping Characterization by Ion Mass and Energy Spectrometry
L. Godet[1], B.-W. Koo[1], Z. Fang[1], S. Radovanov[1], J. Scheuer[1], G. Cartry[2], C. Cardinaud[2], A.Grouillet[3], and D. Lenoble[3]
[1]Varian Semiconductor Equipment Associates, 35 Dory Road, GL-17, Gloucester, MA 01930 USA
[2]Institut des Materiaux de Nantes, FRANCE
[3]Central R&D STMicroelectronics Crolles, FRANCE

3P22: Ar/O_2 Gas Pressure and Arc Current Dependences of Atomic Components of Zirconia Prepared by Intermittent Zirconium Arc PBII&D
Ken Yukimura[1], Hiroaki Yoshinaga[1], Yasunori Ohtsu[1], Hiroharu Fujita[2], and Keiji Nakamura[3]
[1]Department of Electrical Engineering, Doshisha University, 1-3
Tatara-Miyakodani, Kyotanabe, Kyoto 610-0321, Japan
[2]Department of Electrical & Electronic Engineering, Saga University, Honjo-machi1, Saga 840-8502, Japan
[3]Department of Electrical Engineering, College of Engineering, Chubu University, 1200 Matsumoto, Kasugai, Aichi 487-8501, Japan

3P23: Generation of Magnetically Driven Shunting Arc Discharge and Amorphous Carbon Film Preparation
Ken Yukimura[1], Motoya Kumagai[1], Koichi Takaki[2], Seiji Mukaigawa[2], and Tamiya Fujiwara[2]
[1]Department of Electrical Engineering, Faculty of Engineering, Doshisha University, 1-3 Tatara-Miyakodani, Kyotanabe 610-0321, Japan
[2]Department of Electrical and Electronic Engineering, Iwate University, 4-3-5 Ueda, Morioka, Iwate 020-8551, Japan

3P24: Ion Irradiation Effects on the Structural Deformation of Multi-Walled Carbon Nanotubes
Jung-Hyun Cho[1], Ok-Kyoung Kim[1], and Gon-Ho Kim[2]
[1]Department of Physics, Hanyang University, Ansan, Kyunggi-Do, 425-791, South Korea
[2]Department of Nuclear Engineering, Seoul National University, Seoul, 151-741, South Korea

3P25: Ta-based barrier layer improved by Plasma Immersion Ion Implantation
Jiang Suhua[1], Ricky Fu[2] , Paul Chu[2], and Zong Xiangfu[1]
[1]Materials Science Dept. of Fudan University, Shanghai, 200433, China
[2]Department of Physics and Materials Science, City University of Hong Kong

3P26: Improvement of Surface Properties of Magnesium Alloy by Plasma Immersion Ion Implantation - Deposition
S.Q. Yang[1], X.B. Tian[1], C.B. Wei[1], R.K.Y. Fu[2], and P.K. Chu[2]
[1]State Key Laboratory of Welding Production Technology, Harbin Institute of Technology, Harbin, China
[2]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong

3P27: Implantation Dynamics of Plasma Immersion Ion Implantation into Non-Conductive Materials and Applications
Ricky K.Y. Fu[1], X. B. Tian[2], and Paul K. Chu[1]
[1]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]State Key Laboratory of Welding Production Technology, Harbin Institute of Technology, Harbin, China

3P28: Modification of Surface Composition of Teflon by Metal Plasma Ion Implantation
Ricky K. Y. Fu[1], Y. F. Mei[1], C. B. Wei[1,2], X. B. Tian[2], G. G. Siu[1], and Paul K. Chu[1]
[1]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]State Key Laboratory of Welding Production Technology, Harbin Institute of Technology, Harbin, China

3P29: Control of Nitrogen Reactive Species in Helicon Plasmas for III-N Semiconductor Growth
C. Biloiu, E. Scime, F. Doss, and I. A. Biloiu
Physics Department, West Virginia University, Morgantown, WV 26506-6315

3P30: Plasma Assisted Chemical Vapor Deposition of Diamond and Applications: From Large-Grain Polycrystalline Diamond to Nanocrystalline Diamond
Yonhua Tzeng
Plasma Processing Laboratory, Alabama Microelectronics Science and Technology Center, Department of Electrical and Computer Engineering, Auburn University, Auburn, Alabama, USA

3P31: Plasma Enhanced Chemical Vapor Deposited SiN layers For Large Area MC-Si solar Cell Processing
B. Karunagaran, J.S. Yoo, D.Y. Kim, Kyunghae Kim, S.K. Dhulgel, D. Mangalaraj, and Junsin Yi
School of Information and Communication Engineering, Sungkyunkwan University, Suwon - 440-746, Korea

3P32: The Study on Black Silicon Solar Cells Using the High Density Multi-Hollow Cathode Plasma System
J.S. Yoo, K.H. Kim, S.K. Dhungel, B. Karunagaran, D. Mangalaraj, Junsin Yi
School of Information and Communication Engineering, Sungkyunkwan University, 300 Chunking-dong, Jangan-gu, Suwon, Kyunggi-do 440-746, Korea

3P33: Surface Textured ZnO:Al Films by RF Magnetron Sputtering Deposition for Thin Film Solar Cells
J.S. Yoo[1], J.C. Lee[2], S.K. Kim[2], K.H. Yoon[2], I.J. Park[2], D.Y. Kim[1], and Junsin Yi[1]
[1]School of Information and Communication Engineering, Sungkyunkwan University, 300 Chunking-dong, Jangan-gu, Suwon, Kyunggi-do 440-746, Korea
[2]New & Renewable Energy Dept., Korea Institute of Energy Research, P.O. Box 103, Yusung, Taejon, Korea

3P34: Nanosize Powder Synthesis by Pulsed Wire Discharge with Assistance of High-Speed Gas Puff
W. Jiang, Y. Tokoi, H. Suematsu, and K. Yatsui
Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Niigata 940-2188, Japan

Poster Session 3P35-42: Plasma Thrusters

3P35: Steady-State Ion Beam Modeling With Michelle
John J. Petillo, Kenneth Eppley, and Dimitrios Panagos
SAIC

3P36: Ferroelectric Plasma Thruster for Micro-Propulsion
Scott Kovaleski
Electrical and Computer Engineering, University of Missouri – Columbia

3P37: Flow Acceleration in an Electrohydrodynamic (EHD) Dust Using Paraelectric and Peristaltic Effects of a One Atmosphere Uniform Glow Discharge Plasma
Xin Dai and J. Reece Roth
Plasma Sciences Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville TN 37996-2100

3P38: Flow Field Measurements of Peristaltic and Combined Paraelectric and Peristaltic Actuators Using an Impedance Matched Polyphase Power Supply
Manish Yadav, Xin Dai, and J. Reece Roth
Plasma Sciences Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN 37996-2100

3P39: Aerodynamic Flow Control Using Paraelectric and Peristaltic Acceleration of a One Atmosphere Uniform Glow Discharge Plasma
Raja Chandra Mohan Madhan, Josef Rahel, and J. Reece Roth
Plasma Sciences Laboratory, Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN 37996-2100

3P40: Electron Cyclotron Resonance Microwave Plasma Neutralizer for Ion Thruster Systems
Y. Hidaka, R.M. Gilgenbach, M.C. Jones, Y.Y Lau and W.D. Getty
Intense Energy Beam Interaction Laboratory, Nuclear Engineering & Radiological Sciences Dept., University of Michigan, Ann Arbor, MI 48109-2104

3P41: Validation of the Geometric Optics Approximation for Microwave Antenna Analysis with an Inhomogeneous Plasma Plume
A. Garcia, G.A. Hallock, and J.C. Wiley
The University of Texas at Austin, Austin, TX 78712

3P42: Mathematical Modeling of Low Frequency Oscillations of Stationary Plasma Thruster
Stéphane Chable and François Rogier
ONERA- Centre De Toulouse 2, avenue Edouard Belin, BP 4025 - 31055 TOULOUSE CEDEX 4 – France

Poster Session 3P43-48: Plasmas for Lighting

3P43: XeCl Excimer Emission Linear Plasma Arrays
Ronald W. Bentley, and Karl H. Schoenbach
Center for Bioelectrics, Old Dominion University, Norfolk, VA 23529, USA

3P44: Calculation of Current Density and Temperature Distributions at the Cathode Surface Using a Collisional Sheath Model
K.C. Paul[1], T. Takemura[1], T. Hiramoto[1], M. Benilov[2], F. Dawson[3], A. Erraki[3], J.J. Gonzalez[4], G. Zissis[4], D. Lavers[3], and A. Gleizes[4]
[1]R & D Center, Ushio Inc., 1-90 Komakado, Shizuoka 412-0038, Japan.
[2]Department of Physics, University of Madeira, Portugal.
[3]ECE Department, University of Toronto, Canada.
[4]C.P.A.T., University of Paul Sabatier, Toulouse, France

3P45: Noninvasive Observations of Primary (Beam) Electrons Near the Electrode of a Low Pressure Discharge
Richard C. Garner
OSRAM Sylvania, 71 Cherry Hill Dr, Beverly, MA 01915 USA

3P46: Simulations of Plasmas of Positive Column in Rare Gases
E. Bogdanov[1], A.A. Kudryavtsev[1] R.R. Arslanbekov[2], and V.I. Kolobov[2]
[1]St. Petersburg University, St. Petersburg, Russia
[2]CFD Research Corporation, Huntsville, AL, USA

3P47: Computation of Net Emission in High Pressure Metal Halide Lamps for Different Gases.
J.B. Rouffet and G. Zissis
Centre de Physique des Plasmas et Applications Toulouse Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse

3P48: Systematic Observations of 150 W Metal-Halide Arc Lamps Containing a Progression of Additive Chemistries
J.J. Curry and C.J. Sansonetti
National Institute of Standards and Technology, Gaithersburg, Maryland 20899-8422 USA

Poster Session 3P49-52: Flat Panel Displays

3P49: The Characteristics of Current and Voltage in an External Electrode Fluorescent Lamp
Guangsup Cho[1], Joo-Young Lee[1], Dae-Heung Lee[1], Sang-Beom[1], Kim Je-Huan Koo[1], Bong-Soo Kim[1], June-Gill Kang[1], Eun-Ha Choi[1], Soon C. Yang[2], and Ung W. Lee[2]
[1]Department of Electrophysics, Kwangwoon University, 447-1 Wallgye-Dong, Nowon-Gu, Seoul 139-701, Korea
[2]Department of Physics, Mokpo National Univesity, Muan-Gun, Chungye-Myun, Cho-Nam, 534-729, Korea

3P50: Effect of Electric Charge Deposition on the Plasma Radiation of Micro-Gap DBD
Zhitao Zhang, Mindi Bai, Jiagang Zhou, Mindong Bai, and Xiyao Bai
Key laboratory of strong electric-field ionization discharge of Liaoning Province, Dalian Maritime University, Dalian 116026, Liaoning, P.R. China

3P51: Coplanar Long-Gap Discharge Characteristics in AC Plasma Display Panel with High Xe Content
K.C.Choi, S.D.Park, N.H.Shin, and B.J.Shin
Department of Electronics Engineering, Sejong University, 98 Kunja-dong, Kwangjin-gu, Seoul 143-747, Korea

3P52: Deposition of SiO_x Films from HMDSO/O_2 Plasma Under Continuous Wave and Pulsed Modes
Sung-Ryong Kim
Dept. of Polymer Sci. & Eng., Chungju National University Chungju, Chungbuk 308-702 Korea

1:30 Tuesday, June 29, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Paul Bellan, California Institute of Technology

Plenary Talk - PL4:

Mechanisms of Electric Propulsion

Nathaniel Fisch
Princeton University

3:00 Tuesday, June 29, 2004 **Constellation Ballroom C**

Chairperson: Frederick Skiff, University of Iowa

Oral Session 4A: Basic Phenomena - I

4A1-2: Nonlinear Landau Damping and Collisionless Heating in Bounded Plasmas
Igor D. Kaganovich
Plasma Physics Laboratory, Princeton University, Princeton, New Jersey 08543, USA

4A3: Plasma Physics Challenge: Confirm New Plasma Wave Mode Predicted by Space Physics
R. F. Benson[1], V. A. Osherovich[2], J. Fainberg[1], and B. W. Reinisch[3]
[1]NASA/Goddard Space Flight Center, Greenbelt, Maryland
[2]L3 Comm/Goddard Space Flight Center, Greenbelt, Maryland
[3]University of Massachusetts Lowell, Lowell, Massachusetts

4A4: D Resonances as Eigenmodes of Magnetized Plasma
V.A. Osherovich[1], R.F. Benson[2], and J. Fainberg[2]
[1]L3 Comm/ Goddard Space Flight Center, Greenbelt, MD
[2]NASA/Goddard Space Flight Center, Greenbelt, MD

4A5-6: Undulator-Induced Transparency of Magnetized Plasma at the Cyclotron Frequency: ***New Approach to Electromagnetic Energy Compression.***
Gennady Shvets and Mikhail Tushentsov
The University of Texas at Austin.

4A7: Observations of Spatially Constant Peak ArII Emission Phase Threshold at Higher Helicon Densities
J. Scharer[1] , A. Degeling[2], M. Denning[1], S. Tysk[1], K. Akhtar[1], R. Boswell[3] and G. Borg[3]
[1]University of Wisconsin, Madison, USA
[2]Ecole Polytechnique, Lausanne, Switzerland
[3]Australian National University, Canberra

4A8: Effect of Temperature and Pressure on DC Pre-Breakdown Current in Transformer Oil
M. Butcher[1], A. Neuber[1], H. Krompholz[1], J. Dickens[1] and T. Namihira[2]
[1]Center for Pulsed Power and Power Electronics Departments of Electrical and Computer Engineering Texas Tech University Lubbock. TX 79409-3102
[2]Departments of Electrical and Computer Engineering Kumamoto University Kumamoto City, Kumamoto 860-8555, Japan

4A9: Voltage-Current Characteristics of Transformer Oil Under High Electrical Stress
M. Butcher[1], A. Neuber[1], H. Krompholz[1], J. Dickens[1], J. Qian[2], R.P. Joshi[2], K.H. Schoenbach[2]
[1]Center for Pulsed Power and Power Electronics, Departments of Electrical and Computer Engineering, Texas Tech University, Lubbock. TX 79409-3102
[2]Dept. of Electrical & Computer Engineering, Old Dominion University, Norfolk, VA 23529-0246

3:00 Tuesday, June 29, 2004 **Constellation Ballroom D**

Chairperson: Robert Fedosejevs, University of Alberta

Oral Session 4B: Laser Produced Plasmas

4B1: Single-State Measurement of the Electrical Conductivity of Warm Dense Gold
A. Ng[1,2], T. Ao[2], K. Widmann[1], M.E. Foord[1], D.F. Price[1], A.D. Ellis[1], and P.T. Springer[1]
[1]Dept. of Physics & Advanced Technologies, Lawrence Livermore National Laboratory, 7000 East Avenue, Livermore, CA, 94550, USA
[2]Dept. of Physics & Astronomy, University of British Columbia, 6224 Agricultural Road, Vancouver, B.C. V6T 1Z1, Canada

4B2: Probing the Disassembly of Ultrafast Laser Heated Solid Using Frequency Domain Interferometry
T. Ao[1], A. Ng[1,2], Y. Ping[2], K. Widmann[2], D.F. Price[2], and E. Lee[1]
[1]Dept. of Physics & Astronomy, University of British Columbia, 6224 Agricultural Road, Vancouver, B.C. V6T 1Z1, Canada
[2]Dept. of Physics & Advanced Technologies, Lawrence Livermore National Laboratory, 7000 East Avenue, Livermore, CA, 94550, USA

4B3-4: X-ray Thomson Scattering in Dense Plasmas
Arne Höll, Ronald Redmer, Gerd Röpke, and Heidi Reinholz
University of Rostock, Department of Physics, D-18051 Rostock, Germany

4B5: Near THz Radiation from Optically-Induced Plasma Sources
F.J Zutavern, J.V. Rudd, L.A. McPherson, T.R. Nelson, T.S. Luk, and S.M. Cameron
Sandia National Laboratories, Albuquerque, NM 87185-1153

4B6: Hot Electrons, keV X-rays and Fast Ions from Femtosecond Laser Produced Micro Plasma
Cristina Serbanescu[1], Rahim Janmohamed[1], Babak Shokri[1], Ying Tsui[1], Dmitri Romanov[2], Clarence Capjack[1], Wojciech Rozmus[2] and R. Fedosejevs[1]
[1]Department of Electrical and Computer Engineering, University Of Alberta Edmonton, Alberta, Canada T6G2V4
[2]Department of Physics, University Of Alberta Edmonton, Alberta, Canada T6G2V4

4B7: Guided Electric Discharges Induced by Femtosecond Laser Filaments
A. Ting[1], D.F. Gordon[1], R.F. Hubbard[1], E. Briscoe[2], T. Jones[1], C. Manka[2], S.P. Slinker[1], A.P. Baronavski[3], H.D. Ladouceur[3], P.W. Grounds[4], P.G. Girardi[5], and P. Sprangle[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington DC 20375
[2]Reserach Support Instruments, Lanham, MD 20706
[3]Chemistry Division, Naval Research Laboratory, Washington DC 20375
[4]Tactical Electronic Warfare Division, Naval Research Laboratory, Washington, DC 20375
[5]Envisioneering, Inc., King George, VA 22485

4B8: Relativistic Second-Harmonic Generation of a Laser from Underdense Plasmas
K.P. Singh[1], Sushila Yadav[1], V.L. Gupta[1], and V.K. Tripathi[2]
[1]Department of Electronic Science, University of Delhi, New Delhi-110021, India
[2]Department of Physics, Indian Institute of Technology, New Delhi-110016, India

4B9: Characterization of Laser Ablated Al-Plasma in Ambient Atmosphere of Nitrogen
Raj K Thareja and A. K. Sharma
Department of Physics and Centre for Laser Technology, Indian Institute of Technology Kanpur, Kanpur-208 016 (U. P.) India

3:00 Tuesday, June 29, 2004 **Constellation Ballroom E**

Chairperson: Bruce Danly, Naval Research Laboratory

Oral Session 4C: Fast-Wave Devices

4C1: Pushing Past a Megawatt: Development of Long-Pulse High-Power Gyrotrons
S. Cauffman, M. Blank, P. Borchard, P. Cahalan, S. Chu, K. Felch, and H. Jory
Communications & Power Industries, Microwave Power Products Division

4C2: Development of MAGY Code for Modeling of Coaxial Gyrotrons
Alexander N. Vlasov[1], Thomas M. Antonsen Jr.[2], David P. Chernin[1], Igor A. Chernyavskiy[1], Baruch Levush[3], Simon J. Cooke[3], and Khanh T. Nguyen[4]
[1]Science Applications International Corporation; [2]University of Maryland, IREAP;
[3]Naval Research Laboratory; [4]Beam Wave Research, Inc.

4C3-4: Advanced High Power Gyrotrons for EC H&CD Applications in Fusion Plasmas
M. Thumm[1,2], A. Arnold[2], E. Borie[1], G. Dammertz[1], R. Heidinger[3], S. Illy[1], J. Jin[1], K. Koppenburg[1], G. Michel[4], B. Piosczyk[1], T. Rzesnicki[1], D. Wagner[5], and X. Yang[1]
[1]Forschungszentrum Karlsruhe, Association EURATOM-FZK, Institut fuer Hochleistungsimpuls- und Mikrowellentechnik, Postfach 3640, D-76021 Karlsruhe, Germany

4C5: Development of a Terahertz Gyrotron Using a High Field Pulse Magnet
T. Idehara, I. Ogawa, S. Mitsudo, O. Watanabe, M. Kamada, S. Watanabe, J. Kimura, H. Tsuchiya and T. Kanemaki
Research Center for Development of Far-Infrared Region, Fukui University, Fukui 910-8507, Japan

4C6: Gyro-BWO Experiments Using a Helical Interaction Waveguide Based on a Thermionic Cathode
A.W. Cross[1], S.V. Samsonov[2], W. He[1], V.L. Bratman[2], A.D.R. Phelps[1], G.G. Denisov[2], C.G. Whyte[1], A.R. Young[1], K. Ronald[1], C.W. Robertson[1], D.C. Speirs[1], E.G. Rafferty[1], and J. Thomson[1]
[1]Department of Physics, University of Strathclyde, Glasgow, G4 0NG, U.K
[2]Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, 603950, Russia

4C7: Study of Absolute Instabilities in the Gyrotron Traveling-Wave Amplifier
W. C. Tsai[1], T. H. Chang[1], N. C. Chen[1], and K. R. Chu[1], H. H. Song[2] and N. C. Luhmann, Jr.[2]
[1]Department of Physics, National Tsing Hua University, Hsinchu, Taiwan
[2]Department of Applied Science, University of California, Davis, CA 95616

4C8: Frequency-Multiplying Gyrotron Traveling-Wave Tube Amplifier
C.W. Baik[1], S.G. Jeon[1], D.H. Kim[1], N. Sato[2], K. Yokoo[2], and G.S. Park[1]
[1]School of Physics, Seoul National Univ., Seoul 151-747, Korea
[2]Research Institute of Electrical Communication, Tohoku Univ., Sendai 980-8577, Japan

4C9: Prebunching of Electrons in Harmonicmultiplying Cluster-Cavity Gyroamplifiers
Yingyu Miao[1], Thomas M. Antonsen, Jr.[1], Gregory S. Nusinovich[1], Alexander N. Vlasov[2], Hezhong Guo[1], Victor L. Granatstein[1]
[1]Institute for Research in Electronics and Applied Physics,
University of Maryland, College Park, MD 20742
[2]Science Applications International Corporation, McLean, VA 22102

4C10: TE_{21} Second-Harmonic Gyro-TWT Amplifier with an Axis-Encircling Beam
S.B. Harriet[1,2], D.B. McDermott[1], D. A. Gallagher[3], and N.C. Luhmann, Jr.[1]
[1]Department of Applied Science, University of California at Davis, Davis, CA 95616
[2]Crane Division, Naval Surface Warfare Center, (NSWC Crane), Crane, IN
[3]Northrop Grumman Corporation, Rolling Meadows, IL

3:00 Tuesday, June 29, 2004 **Constellation Ballroom F**

Chairperson: Kevin Baker, Lawrence Livermore National Laboratory

Oral Session 4D: Pulsed-Power Applications of Plasmas - I

4D1: Status of Electra: A Repetitively Pulsed, Electron Beam Pumped KrF Laser Facility
F. Hegeler[1], M. Friedman[1], M.C. Myers[2], J.D. Sethian[2], J.L. Giuliani[2], D.D. Hinshelwood[2], M.F. Wolford[3], T.C. Jones[4], D.V. Rose[5], D. Welch[5], D. Weidenheimer[6], and D. Morton[6]
[1]Commonwealth Technologies, Inc.
[2]Naval Research Laboratory, Plasma Physics Division
[3]Science Applications International Corp.
[4]Research Support Instruments
[5]Mission Research Corporation; [6]Titan PSD, Inc.

4D2: Vacuum Arc Plasma Jets and Their Applications
Michael Keidar[1] and Isak I. Beilis[2]
[1]Department of Aerospace Engineering, University of Michigan, Ann Arbor MI 48109
[2]Electrical Discharge and Plasma Laboratory, Tel Aviv University, P. O. B. 39040, Tel Aviv 69978, Israel

4D3: Correlated Electrical and Optical Diagnostics of Water Switches Operating at 4 MV
J.M. Lehr[1], J.R. Woodworth[1], J.E. Maenchen[1], D.L. Johnson[2], J.P. Corley[3], and G.S. Sarkisov[3]
[1]Sandia National Laboratories, Albuquerque, New Mexico
[2]Titan Pulse Sciences Division, San Leandro, California
[3]Ktech Corporation, 1300 Eubank Blvd SE, Albuquerque, New Mexico

4D4: Laser-Triggered Water Switching
J. R. Woodworth[1], D. A. Chalenski[1], D. L. Johnson[2], G. S. Sarkisov[3], and J. R. Blickem[3]
[1]Sandia National Laboratories, Albuquerque, NM, 87185-1193, USA
[2]Titan Pulse Sciences, 2700 Merced St. San Leandro CA 94577, USA
[3]Ktech Corporation, 1300 Eubank SE, Albuquerque, NM 87123, USA

4D5: Modeling of High Current Water Discharges for High Energy Transfer Pulsed Power Systems to Determine Steady State Conduction Resistance
Juan M. Elizondo[1], Kenneth R. Prestwich[2], John Corley[3], David L Johnson[4], Pat Corcoran[4], Joseph Woodworth[1], Jane Lehr[1], and Kenneth Struve[1]
[1]Sandia National Laboratories; [2]K-Tech Corp; [3]Titan/PSD; [4]Prestwich Consulting

4D6: Electrical Breakdown in Polar Liquids
J.F. Kolb[1], Y. Minamitani[1], S. Xiao[1], S. Kono[1], B. Goan[1], X.P. Lu[1], J. Qian[1], M. Laroussi[1], R.P. Joshi[1], K.H. Schoenbach[1], and Edl Schamiloglu[2]
[1]Center for Bioelectrics, Old Dominion University, Norfolk, Virginia 23510
[2]Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM 87131

4D7: Particle-in-Cell Simulations of the ZR Magnetically Insulated Transmission Lines
T.D. Pointon[1], M.E. Savage[1], and T.P. Hughes[2]
[1]Sandia National Laboratories, Albuquerque, NM 87185-1152, USA
[2]Mission Research Corporation, Albuquerque, NM 87106-4245, USA

4D8: Cathode Plasma Expansion in Magnetically Insulated Transmission Lines
T.P. Hughes[1], B.V. Oliver[1], T.C. Genoni[1], T.D. Pointon[2] and M.E. Savage[2]
[1]Mission Research Corporation Albuquerque, New Mexico
[2]Sandia National Laboratories, Albuquerque, New Mexico

4D9: Pulsed Gas Breakdown With High Overvoltages in Argon and Air

E. Crull, H. Krompholz, A. Neuber, and L. Hatfield
Center for Pulsed Power and Power Electronics Departments of Electrical & Computer Engineering and Physics Texas Tech University, Lubbock, TX 79409

4D10: Small Pseudospark Switches

C. Jiang, A. Kuthi, and M.A. Gundersen
University of Southern California, Los Angeles, CA 90089

3:00 Tuesday, June 29, 2004 **Constellation Ballroom A**

Poster Session 4P1-12: Intense Beam Microwave Generation

4P1: Comparison of Time and Frequency Domain Antenna Measurement
K.J. Hendricks, J. Heggemeier, and A Greenwood
Air Force Research Laboratory, Directed Energy Directorate, Kirkland AFB, NM

4P2: Simulation of a Relativistic Magnetron with a Varying Axial Magnetic Field
K.L. Cartwright[1], P.J. Mardahl[1], M.D. Haworth[1], V.B. Neculaes[2], M.C Jones[2], M.R. Lopez[3], Y.Y. Lau[2], and R.M. Gilgenbach[2]
[1]Air Force Research Laboratory
[2]University of Michigan
[3]Sandia National Laboratory

4P3: Effects of a Finite Axial Magnetic Field on the Beam Loading on a Cavity
Richard Kowalczyk, Y. Y. Lau, and R. M. Gilgenbach
University of Michigan, Ann Arbor, MI, 48109-2104, USA

4P4: Projection Ablation Lithography Cathodes for a High Current Relativistic Magnetron
M.C Jones[1], R.M. Gilgenbach[1], W.M. White[1], M.R. Lopez[1], V.B. Neculaes[1], Y.Y. Lau[1], T.A. Spencer[2], and D. Price[3]
[1]Intense Energy Beam Interaction Lab, Nuclear Engineering and Radiological Sciences Department, University of Michigan, Ann Arbor, MI 48109-2104
[2]Air Force Research Laboratory, Phillips Research Site, Kirtland AFB, NM
[3]Lockheed Martin Corporation

4P5: RF and Magnetic Priming of Relativistic Magnetrons
W.M. White[1], R.M. Gilgenbach[1], M.C. Jones[1], V.B. Neculaes[1], Y.Y. Lau[1], M.R. Lopez[1], P. Pengvanich[1], Y. Hidaka[1], N. Jordan[1], T.A. Spencer[2] and D. Price[3]
[1]Intense Energy Beam Interaction Lab, Nuclear Engineering and Radiological Sciences Dept., University of Michigan, Ann Arbor, MI 48109-2104
[2]Air Force Research Lab, Kirtland AFB, NM
[3]Lockheed Martin, San Leandro, CA

4P6: Operation of a Relativistic Magnetron with a "Cut Cathode"
Mikhail Fuks and Edl Schamiloglu
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque NM, 87131 USA

4P7: An Alternative Method for Calculating the Space-Charge-Limited Current for a Cylindrical Diode
S. Prasad, R.L. Wright, and E. Schamiloglu
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque NM, 87131 USA

4P8: Confinement Criterion for a Finite Sized Bunched Beam
Chiping Chen and Mark Hess
MIT - Plasma Science and Fusion Center

4P9: Self-Magnetic Cusp Limit of a Finite Sized Bunched Relativistic Annular Electron Beam
Mark Hess and Chiping Chen
MIT - Plasma Science and Fusion Center

4P10: Production of High Power Microwaves with a Compact Marx Generator
J. Gardelle[1], Bruno Cassany[1], Thierry Desanlis[1], Patrick Modin[1] and J.T. Donohue[2]
[1]CEA-CESTA BP N° 2, 33114 Le Barp France
[2]CENBG, BP 120, 33175 Gradignan, France

4P11: Comparison of Recent High Efficiency Vircator
Max Chung
Department of Electronics Engineering, Southern Taiwan University of Technology

4P12: Vircator Efficiency Enhancement at Plasma Assistance
I.N. Onishchenko Yu.V. Prokopenko, S.S. Pushkarev, and P.T. Chupikov
NSC "Kharkov Institute of Physics and Technology", Ukraine

Poster Session: 4P13-26: Intense Electron and Ion Beams - II

4P13: Interaction of e-Beams with Tantalum Foils and Ta2O5 Foam
Darwin Ho, George Zimmerman, and Rollin Harding
Lawrence Livermore National Laboratory

4P14: Inverse Compton Scattering Electron Spectroscopy of Intense Electron Beam Diodes
A.D.J. Critchley
Pulsed Power Group, AWE Aldermaston, Berkshire, RG7 4RP, UK

4P15: A Low Cost Time Resolved Spot Diagnostic For Flash X-Ray Machines
C. Aedy, S.Quillin, and A.D.J.Critchley
Advanced Radiography Group, AWE Aldermaston, Berkshire, RG7 4RP, UK

4P16: Self-Field Compensation In High-Current Reb Transported By Grad-B Drift In Azimuthal Magnetic Field
V. Chornyi, G. Tsepilov, A. Frolov, V. Dubina, V. Solovyov, A. Chornyi
The V.N. Karazin Kharkov National University, Ukraine

4P17: 3D Model of Child-Langmuir Law
L.K. Ang and W.S. Koh
School of Electrical and Electronic Engineering, Nanyang Technolgical University, Singapore 639798

4P18: Influence of Upstream Ion Current on Relativistic Field-Emission-Limited Diodes
Ming-Chieh Lin[1,2]
[1]Department of Physics, Fu Jen University, Taipei, Taiwan 24205, R.O.C.
[2]Institute of Nanotechnology, National Chiao Tung University, Hsinchu, Taiwan 30050, R.O.C.

4P19: Reconsidering Thermionic Emission Mechanism Quantum Mechanically
Ming-Chieh Lin[1,2] and Der San Chuu[3]
[1]Department of Physics, Fu Jen University, Taipei, Taiwan 24205, R.O.C.
[2]Institute of Nanotechnology, National Chiao Tung University, Hsinchu, Taiwan 30050, R.O.C.
[3]Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan 30050, R.O.C.

4P20: Ions Acceleration by Virtual Cathode at Plasma Injection
P.T. Chupikov[1], D.V. Medvedev[1], I.N. Onishchenko[1], N.I. Onishchenko[1], B.D. Panasenko[1], Yu.V. Prokopenko[1], S.S. Pushkarev[1], R.J. Faehl[2], and A.M. Yegorov[1]
[1]NSC "Kharkov Institute of Physics and Technology", Ukraine
[2]Los Alamos National Laboratory, USA

4P21: Low Frequency Behavior of IREB Virtual Cathode at Plasma Injection
V.A. Balakirev, I.N. Onishchenko, and N.I. Onishchenko
NSC "Kharkov Institute of Physics and Technology", Ukraine

4P22: High-Frequency Electron Beam Generation by Ferroelectric Cathode with Anomalous Plasma Resistance Caused by Ion-Acoustic Instability
K. Chirko[1], V.Ts. Gurovich[1], Ya. E. Krasik[1], O. Peleg[1], J. Felsteiner[1], and V. Bernshtam[2]
[1]Physics Department, Technion, 32000 Haifa, Israel
[2]Weizmann Institute of Science, 76100 Rehovot, Israel

4P23: Recent Development and Applications of Electron, Ion and Plasma Sources Based on Vacuum Arc and Low Pressure Glow
A. Vizir[1], V. Gushenets[1], A. Nikolaev[1], E. Oks[1,2], G. Yushkov[1], V. Burdovitsin[2], and N. Rempe[2,3]
[1]High Current Electronics Institute, Tomsk,634055, Russia,
[2]State University of Control Systems and Radioelectronics, Tomsk,634050, Russia,
[3]Small business company “ELION LTD”, Tomsk, 634050, Russia

4P24: High-Kinetic Energy Charged Particle Beam
Clint Seward
Electron Power Systems, Inc. 978 263-3871

4P25: Experimental Status of The 2 MeV 17 GHz RF Gun at MIT
A. Kesar[1], J. Haimson[2] , S. Korbly[1], I. Mastovsky[1], B. Mecklenburg[2], and R. J. Temkin[1]
[1]MIT Plasma Science and Fusion Center, 167 Albany, Cambridge, MA 02139, USA
[2]Haimson Research Corporation, 3350 Scott Blvd., Building 60, Santa Clara, CA 95054-3104, USA

4P26: Effects of Neutron Irradiation at the Interface of TiO_2 film on Si Substrate
L. Zeng, X. Zhang, F. Q. Kong, and J. Zhang
Dept. of Physics, Yunnan University, Kunming, P.R. China

Poster Session 4P27-45: Fast Z-Pinches, X-Ray Lasers, and Dense Plasma Focus - II

4P27: Measurement and Analysis on Soft X-Ray Spectrum Produced by Z-Pinch Plasma
Xiaobin Zou, Guixin Zhang, Min Han, Xinxin Wang, Peng Li
Department of Electrical Engineering, Tsinghua University Beijing, China

4P28: A Supersonic Nozzle for Gas-Puff Z-Pinch
Wei Li, Xinxin Wang, Xiaobing Zou, Ruili Ma, Min Han and Guixin Zhang
Tsinghua University, Beijing, China

4P29: Dynamics of a Radiating Large Diameter Argon Gas Puff Plasma on the DQ Simulator
Y. K. Chong[1], J. W. Thornhill[1], R. Terry[1], R. W. Clark[1], J. Davis[1], M. H. Frese[2], S. D. Frese[2]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC
[2]NumerEx, Albuquerque, NM

4P30: Numerical Simulation of Cold Flow for Initialization of Gas-Puff Z-Pinches
W. Michael Scott, Kenneth E. Tatum, and E. Stan Powell
Arnold Engineering Development Center, Arnold Air Force Base, Tennessee 37389-6700

4P31: Two-dimensional MHD Simulation of Argon Gas Puff Nozzle Flows and Z-Pinches
Michael H. Frese[1], Sherry D. Frese[1], Gerald C. Craddock, Jr.[1], Robert Terry[2], Ward Thornhill[2], and Young Chong[21]NumerEx
[2]Naval Research Laboratory, Radiation Hydrodynamics Branch

4P32; Recent Activities On Plasma Focus Experiment at IPR
V. Chaudhari , A. Shyam, S. Chaturvedi, Rajesh Kumar, D., Lathi, Partha Sarkar, R. Verma, R. Shukla, K. Debnath, J. Sonara, K. Shah, B. Adhikary and J. Trivedi
Institute for Plasma Research, Bhat Gandhinagar – 382428, Gujarat, India

4P33: Use of Discrete B-Dot Loops for Load Curent Measurements Very Close to an Argon Z-Pinch on Double Eagle
J. Thompson[1], R. Allen[2], P. Coleman[1], R. Commisso[2], N. Qi[3], M. Scott[4] and B. Weber[2]
[1]Alameda Applied Sciences Corp.,, 2235 Polvorosa Ave., Suite 230, San Leandro, CA 94577 USA
[2]Pulsed Power Physics Branch, Naval Research Laboratory, Washington, D.C. 20375, USA
[3]Titan Pulsed Sciences Division, 2700 Merced Street, San Leandro, CA 94577 USA
[4]Decade Radiation Test Facility, Arnold Engineering Development Center, Arnold AFB, TN 37389 USA

4P34: Measurement of Mass Density and Charge State of Precursor Plasma in Linear Wire Array Experiments
Min Hu and Bruce R. Kusse
Lab of Plasma Studies, Cornell University, Ithaca, NY, 14853

4P35: Modeling of the K-Shell Radiation Production in Stainless Steel Nested Wire Arrays on Z
V.I. Oreshkin[1], A.L. Velikovich[2], J. Davis[2], C.A. Coverdale[3], and C. Deeney[3]
[1]High Current Electronics Institute, SB RAS, Tomsk, Russia
[2]Plasma Physics Division, Naval Research Laboratory
[3]Sandia National Laboratories

4P36: Creation of a Single-Shot Micrometer-Size X-Ray Source in X-Pinch Discharge Energized by Very Fast Capacitor Bank
L.E. Aranchuk, J. Larour, and A.S. Chuvatin
LPTP, UMR 7648 CNRS, Ecole Polytechnique, 91128 Palaiseau, France

4P37: Effect of the Thermal Instability on the Conductor Electrical Explosion
R.B. Baksht[1], V.I. Oreshkin[1], N.A. Ratakhin[1], A.G. Rousskich[1], A. Yu. Labetsky[1], A.V. Shishlov[1], P.R. Levashov[2], K.V. Khitschenko[2], and I.I.Beilis[3]
[1]Institute of High Current Electronics, SB, RAS, Tomsk
[2]Institute for High Energy Densities, RAS, Moscow
[3]Tel Aviv University, Tel Aviv, Israel

4P38: Explosion of Thin Al Foils in Air
R.Baksht, A.Pokryvailo, E. Yankelevich, and I. Ziev
Propulsion Physics Laboratory, Soreq NRC Yavne 81800, Israel

4P39: Influence of Initial and Boundary Discharge Conditions on Soft X-Ray Amplification in the Fast Gas-Filled-Capillary Discharge
K. Kolacek, J. Schmidt, V. Prukner, V. Bohacek, M. Ripa, J. Straus, P. Vrba, and O. Frolov
Inst. of Plasma Physics, Academy of Sciences of the Czech Rep. Za Slovankou 3, P.O.Box 17, 182 21 Prague 8, Czech Republic

4P40: Experimental Investigation of Debris Mitigation in Discharge Produced EUV Light Source
Masato Watanabe[1], Inho Song[1], Yasushi Hayashi[1], Akitoshi Okino[1], Koichi Yasuoka[2], Kazuhiko Horioka[1], and Eiki Hotta[1]
[1]Department of Energy Sciences, Interdisciplinary Graduate, School of Science and Engineering, Tokyo Institute of Technology, Nagatsuta 4259, Midori-ku, Yokohama 226-8502, Japan
[2]Department of Electrical and Electronic Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology, O-Okayama 2-12-1, Meguro-ku, Tokyo 152-8552, Japan

4P41: Influence of External Magnetic Field on Development of Z- Pinch Instabilities
V.I. Sotnikov[1], J. N. Leboeuf[2], C. Deeney[3], P. Hellinger[4], P. Travnicek[4], and V. Fiala[4]
[1]University of Nevada, Reno, NV 89557
[2]University of California, Los Angeles, CA 90095
[3]Sandia National Laboratory, NM 87185
[4]Institute of Atmospheric Physics, Prague 4, Czech Republic

4P42: $L\alpha_2$ Satellites in X-Ray Emission Spectra of Higher Z Elements
Surendra Poonia
Division of Natural Resources and Environment, Central Arid Zone Research Institute, Jodhpur - 42 003, Rajasthan, India

4P43: Preliminary Observations of Cusp Cross-Section Pinch
Mehrdad A.M.Kashani and Tetsu Miyamoto,
Atomic Science Research Institute, 2-13-19, Higashi Kokubun, Ichikawa272-0833, Chiba, Japan

4P44: Study of Time-Resolved Neutron Spectra by MCNP Code and Monte-Carlo Method in a Filippov Type Plasma Focus
A.R. Babazadeh[1] and M. Abdollahzadeh[2]
[1]Dept. of Physics, Qom University, P.O.Box 37165, Qom, Iran
[2]Dept. of Physics, Imam Hossein University,Tehran, Iran

4P45: Investigation on the Application of the Capillary-Discharge Based Metal-Vapor Generator and the 46.9 nm Ar Capillary-Discharge Soft X-Ray Laser
J. Kaiser[1], M. Liška[1], A. Ritucci[2], S.V. Kukhlevsky[3], A. Reale G. Tomassetti[2], O. Samek[1], F. Flora[4], and L. Mezi[4]
[1]Institute of Phys. Engineering, Brno Univ. of Technology, Technicka 2, 616 69 Brno, Czech Republic
[2]Phys. Dept. Univ of L'Aquila, gc Lngs of Infn, Infm via Vetoio, 67010 Coppito, L'Aquila, Italy
[3]Dept. of Experimental Physics, University of Pecs, Ifjusag u. 6, 7624 Pecs, Hungary
[4]ENEA Dip. Innovazione, Divisione Fisica Applicata, Centro Ricerche Frascati C.P. 65, 00044 Italy

Poster Session 4P46-54: Non-Equilibrium Plasma Processing - II

4P46: The Effect of Amorphous Carbon Films Deposited on Polyethylene Terephthalate on Blood Compatibility
J. Wang[1,2], S.C.H. Kwok[1], N. Huang[2], P. Yang[2], Y. X. Leng[2], J.Y. Chen[2], H. Sun[2], and P.K. Chu[1]
[1]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]Dept. of Materials Engineering, Southwest Jiaotong University, Chengdu, China

4P47: Enhanced Mechanical Properties of Biomedical Poly(ethylene terephthalate) Surface Modified by Acetylene Plasma Immersion Ion Implantation-Deposition
J. Wang[1] , Y.X.Leng[1] , J.Y. Chen[1], G.J. Wan[1,2], P. Yang[1], H. Sun[1], N. Huang[1] and P.K. Chu[2]
[1]School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, China
[2]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong

4P48: Characterization of TiO_2 Films Prepared by Reactive Magnetron Sputtering at Different Oxygen Partial Pressures
L.X. Xu, Y.X. Leng , P. Yang, Q. Zhang, F.M. Gong, N. Huang
School of Materials Science & Engineering, South West Jiaotong University, Chengdu 610031, Sichuan, China

4P49: TiN Synthesized by Filtered Arc Deposition Combined with Electron Cyclotron Resonance
G.J. Wan[1, 2], Y.X. Leng[2], H. Sun[2], N. Huang[2], and P.K. Chu[1]
[1]Dept of Physics and Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]College of Materials Science and Engineering, Southwest Jiaotong University, Chengdu 610031, China

4P50: Structure and Properties of Fluorine Doped Diamond-like Carbon Films Synthesized by Pulsed Vacuum Arc Plasma Deposition
Zh.Q. Yao, P. Yang, N. Huang, H. Sun, J. Wang
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Material Processing of Chinese Education Ministry, Southwest Jiaotong University,
Chengdu, 610031, China

4P51: A Comparative Study of Fluorinated Amorphous Carbon Films Synthesized by Pulsed Vacuum Arc Plasma Deposition and by PECVD
Zh.Q. Yao, P. Yang, N. Huang, H. Sun, J. Wang
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Material Processing of Chinese Education Ministry, Southwest Jiaotong University,
Chengdu, 610031, China

4P52: Experimental Pulsed Plasma Thruster for Code Evaluation
T. Moeller, D. Keefer, and R. Rhodes
University of Tennessee Space Institute

4P53: Study of Optimize Deposition of Thin Film in DC Magnetron: Sputtering and Measuring the Surface Conductivity by Four Point Probe and Hall Effect
M. Mahmoudzadeh, F. Bahadori, and M. Ghoranneviss
Plasma Physics Research Lab., P.O. Box 14155-7574, Tehran, Iran

4P54: Studies of a Few Monolayers of Cu/Brass on Glass Surfaces Using AFM and TEM
F. Bahadori, M. Ghoranneviss, and M. Mahmoudzadeh
Plasma Physics Research Lab., P.O. Box 14155-7574, Tehran, Iran

Poster Session 4P55-62: Thermal Plasma Chemistry and Processing - I

4P55: Development of Twin Torch Plasma Arc for Hazardous Waste Treatment
T. Iwao[1], H. Takizawa[2] and T. Inaba[3]
[1]Department of Electrical and Electronic Engineering, Musashi Institute of Technology 1-28-1 Tamazutsumi, Setagaya, Tokyo 158-8557, Japan
[2]Graduate School of Science and Engineering, Chuo University 1-13-27 Kasuga, Bunkyo, Tokyo 112-8551, Japan
[3]Fuculty of Science and Engineering, Chuo University 1-13-27 Kasuga, Bunkyo, Tokyo 112-8551

4P56: Langmuir Probe Measurements in the Anode Boundary Layer of a High Intensity Arc
P. Cronin[1], G. Yang[1], T. Iwao[2], and J. Heberlein[1]
[1]Department of Mechanical Engineering, University of Minnesota, Minneapolis, USA
[2]Department of Electrical and Electronic Engineering, Musashi Institute of Technology, Tokyo, Japan

4P57: Thermal Plasma Processing of B_4C and Al-B_4C Nanopowders
N.R. Thakkar and R.G. Reddy
Department of Metallurgical and Materials Engineering, The University of Alabama, Box 870202, Tuscaloosa, AL 35487

4P58: High Pressure Radio Frequency Induction Thermal Plasma Generation Using T-LCL Immittance Circuit
M. A. Razzak[1], Y. Suzuki[1], S. Takamura[1] and Y. Uesugi[2]
[1]Department of Energy Engineering and Science, Graduate School of Engineering, Nagoya University, Nagoya 464-8603, Japan
[2]Department of Electrical and Electronic Engineering, Kanazawa University, Ishikawa 920-8667, Japan

4P59: Development of A New Multi-Plasma Gas Inductively Coupled Plasma Torch
Akitoshi Okino, Hidekazu Miyahara, Hironobu Yabuta, Yoichi Mizusawa, Takayuki Doi, Masato Watanabe and Eiki Hotta
Department of Energy Sciences, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama 224-0032, Japan

4P60: Investigation on a Low Pressure Plasma Jet in an Inductively Coupled Plasma
Zhen-dong Yu, Zhi-gang Guo, Jie Ma, and Yi-kang Pu
Department of Engineering Physics, Tsinghua University, Beijing, 100084, China

4P61: Application of a Microwave-Driven Plasma Torch to Thermal Chemistry
Michael Read, Willi Schwarz and David Oakes
Physical Sciences Inc., Sterling, Va 20166

4P62: Discussion of Electrical Discharge Machining in Gas
Li.Q. Li, W.Sh. Zhao, Zh.L. Wang, B.Q. Kou, and Li.Y. Li
School of Mechanical and Electrical Engineering, Harbin Institute of Technology, Harbin, China

8:00 Wednesday, June 30, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Frederick Skiff, University of Iowa

Plenary Talk - PL5:

Not Your Father's Collisional Transport: a New Paradigm for Plasmas with Small Cyclotron Radius

Daniel Dubin
University of California, San Diego

9:30 Wednesday, June 30, 2004 **Constellation Ballroom C**

Chairperson: Timothy Grotjohn, Michigan State University

Oral Session 5A: Plasma, Ion, and Electron Sources; Intense Electron and Ion Beams - II

5A1: The Vacuum Arc Plasma Source and its Applications
T. Schuelke, M. Becker, T. A. Grotjohn, and Jes Asmussen
Fraunhofer Center for Coatings and Laser Applications, Michigan State University, East Lansing, MI 48824

5A2: Two Methods to Control Ion Energy and Influx to Substrate in an ICP with Superimposed Magnetic Field
V. Vartolomei[1], M. Hannemann[2], and R. Hippler[1]
[1]University of Greifswald Institute of Physics, Domstrasse 10A, Greifswald, Germany
[2]INP-Greifswald Friedrich-Ludwig-Jahn-Str. 19,D-17489, Greifswald, Germany

5A3: Miniature Microwave Plasma Torch Applicator and its Characteristics
Stanley Zuo, K. Hemawan, J.J. Narendra, T.A. Grotjohn, and J. Asmussen
ECE Department, Michigan State University & Fraunhofer Center for Coatings and Laser Applications, East Lansing, MI 48824

5A4: Grid-Controlled Electron Emission from a Hollow-Anode Electron Source
A. Krokhmal, J. Z. Gleizer, Ya. E. Krasik, V. Ts. Gurovich, and J. Felsteiner
Physics Department, Technion, 32000 Haifa, Israel

5A5: "Zero-Current" to Extreme Space-Charge Beam Transport Experiments on the University of Maryland Electron Ring (UMER)
S. Bernal, H. Li, T. Godlove, I. Haber, J. Harris, R. A. Kishek, B. Quinn, M. Reiser, M. Walter, M. Wilson, Y. Zou, and P.G. O'Shea
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD 20742

5A6-7: Challenges for Ionized Physical Vapor Deposition
J. A. Hopwood and D. Mao
Northeastern University, Boston, Massachusetts 02115

5A8: Analytical and Numerical Studies of the Complex Interaction of a Fast Ion Beam Pulse with a Background Plasma
Igor D. Kaganovich, Edward A. Startsev, and Ronald C. Davidson
Plasma Physics Laboratory, Princeton University, Princeton, New Jersey 08543, USA

5A9: Propagation Across B-Field of Intense Plasma and Ion Beams in Vacuum and Magnetized Plasma
M. Anderson, Vit. Bystritskii, E. Garate, N. Rostoker, Y. Song, A. VanDrie, and M. Binderbauer
Department of Physics and Astronomy, University of California at Irvine, CA, 92697, USA
Tri Alpha Energy Inc., Foothill Ranch, CA, 92610, USA

9:30 Wednesday, June 30, 2004 **Constellation Ballroom D**

Chairperson: Raymon Leeper, Sandia National Laboratories

Oral Session 5B: High-Density/Pulsed Plasma Diagnostics

5B1: **Dynamic Hohlraum Temperature Diagnosis from Absorption Line Spectroscopy**
J.P. Apruzese[1], R.W. Clark[1], P.C. Kepple[1], J. Davis[1], T.W.L. Sanford[2], T.J. Nash[2], R.C. Mock[2], and D.L. Peterson[3]
[1]Plasma Physics Division, Naval Research Laboratory, Washington DC
[2]Sandia National Laboratories, Albuquerque NM
[3]Los Alamos National Laboratory, Los Alamos NM

5B2-3: **Diagnostic Technology Development for NIF by LLNL Experimental Programs**
P.M. Bell
LLNL, Livermore, CA USA 94551-0808

5B4-5: **NIF neutron bang-time detector prototype test on OMEGA**
V.Yu. Glebov[1], C. Stoeckl[1], T.C. Sangster[1], S. Roberts[1], G.J. Schmid
Laboratory for Laser Energetics, University of Rochester
Lawrence Livermore National Laboratory, Livermore, CA

5B6: **Diagnostics in a High-Density Plasma Generated by a Pulsed Electron Beam**
D. Leonhardt[1], S.G. Walton[1], C. Muratore[2], and R.F. Fernsler[1]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]NRL/ASEE Postdoctoral Research Fellow

5B7: **Experimental Investigation of Non-Thermal Electric Fields and Plasma Waves in Pulsed-Power Plasmas**
K. Tsigutkin, E. Stambulchik, V. Bernshtam, and Y. Maron
Faculty of Physics, Weizmann Institute of Science, Rehovot, Israel

5B8: **Step-Wedge Spectrometer for Pulsed X-ray Sources**
Fletcher J. Goldin[1] and Maurice Aufderheide[2]
[1]Bechtel Nevada, Livermore, CA 94550

5B9: **Energy Characterization of a High-Density Plume Using a Directional Micro-Retarding Potential Analyzer**
James Partridge and Nikolaos A. Gatsonis
Mechanical Engineering Department, Worcester Polytechnic Institute, Worcester, MA 01609

9:30 Wednesday, June 30, 2004 **Constellation Ballroom E**

Chairperson: Thomas Antonsen, University of Maryland

Oral Session 5C: Intense Beam Microwave Generation/Modeling of Microwave Devices

5C1 : High Power Free Electron Maser Based on a Two-Dimensional Bragg Cavity
I.V. Konoplev[1], P. McGrane[1], A. W. Cross[1], A. D. R. Phelps[1], W. He[1], C.G. Whyte[1], K. Ronald[1], N.S. Ginzburg[2], N. Yu. Peskov[2], A. S. Sergeev[12], and M. Thumm[3]
[1]Department of Physics, University of Strathclyde, Glasgow, G4 0NG, UK
[2]Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia, 603950
[3]Forschungszentrum Karlsruhe (FZK), Institut fur Hochleisttungsimpuls- und Mikrowellentechnik Karlsruhe, Germany, D-76021

5C2: Microwave Pulse Compression Using a Helically Corrugated Waveguide
G. Burt[1], S.V. Samsonov[2], A.D.R. Phelps[1], V.L. Bratman[2], A.W. Cross[1], G.G. Denisov[2], K. Ronald [1], W. He[1], I. V. Konoplev[1],A. R. Young[1], and H. Yin[1]
[1]Department of Physics, University of Strathclyde, Glasgow, G4 0NG, Scotland, U.K.
[2]Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, 603950, Russia

5C3: High-Power Microwave Generation by Virtual Cathode Oscillator
W. Jiang, M. Shimada, K. Kanbara, and K. Yatsui
Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Niigata 940-2188, Japan

5C4: Chaos in Crossed-Field Devices
D. Li, P.A. Lindsay, and X. Chen
Dept. of Electronic Engineering Queen Mary, University of London, London E1 4NS, UK

5C5: BWO Power Holes and Unstable Interaction with the Fast Space Charge Wave
D. Chernin[1], T.M. Antonsen, Jr.[1], and B. Levush[2]
[1]Science Applications International Corporation, McLean, VA 22102
[2]Naval Research Laboratory, Washington, DC 20875

5C6: Accurate 3-D Simulation of Coupled-Cavity TWT Structures
S.J.Cooke and B.Levush
Vacuum Electronics Branch, Code 6840, NRL, 4555 Overlook Ave S.W., Washington DC 20375

5C7: Recent Advances in the Michelle 2D/3D Electron Gun and Collector Modeling Code
John Petillo[1], Kenneth Eppley[1], Dimitrios Panagos[1], Eric Nelson[2], Norman Dionne[3], John DeFord[4],Ben Held[4], Liya Chernyakova[4], James Burdette[5], Xiaoling Zhai[5], Mark Cattelino[6], Richard True[7], Khanh Nguyen[8], and Baruch Levush[9]
[1]SAIC; [2]LANL; [3]Raytheon; [4]STAR; [5]Boeing; [6]CPI; [7]L-3; [8]BW Research; [9]NRL

5C8: Modeling of High Power Klystrons Using TESLA
Alexander N. Vlasov[1], Thomas M. Antonsen Jr.[2] David P. Chernin[1], Baruch Levush[3], Simon J. Cooke[3], and Khanh T. Nguyen[4]
[1]Science Applications International Corporation
[2]University of Maryland, IREAP
[3]Naval Research Laboratory
[4]Beam Wave Research, Inc.

9:30 Wednesday, June 30, 2004 **Constellation Ballroom F**

Chairperson: Scott Kovaleski, University of Missouri, Columbia

Oral Session 5D: Plasma Thrusters; Plasmas for Lighting; Flat Panel Displays

5D1: A Study of Wall Effects on Hall Thruster Operation
Y. Raitses, D. Staack, and N. J. Fisch
Princeton Plasma Physics Laboratory, Princeton, NJ 08543

5D2: Plasma Flow in High-Power Thruster with Anode Layer
Michael Keidar[1], Iain D. Boyd[1], and Isak I. Beilis[2]
[1]Department of Aerospace Engineering, University of Michigan, Ann Arbor MI 48109
[2]Tel Aviv University, Tel Aviv, Israel

5D3: Characterization of Simulated Ion Beam Neutralization Stability in Two and Three Dimensions
Adrian Wheelock[1], David L. Cooke[1], and Nikolaos A. Gatsonis[2]
[1]Air Force Research Laboratory, Space Vehicles Directorate, Hanscom AFB, MA
[2]Mechanical Engineering Department, Worcester Polytechnic Institute, Worcester, MA 01609

5D4: Plasma Sources for Micro-Thrusters
Ramesh A. Arakoni[1] and Mark J. Kushner[2]
[1]Dept. of Aerospace Engr., University of Illinois, 1406 W. Green St., Urbana, IL 61801 USA
[2]Dept. of Electrical and Computer Engr., University of Illinois, 1406 W. Green St., Urbana, IL 61801 USA

5D5: The MET (Microwave Electro-Thermal) Thruster Using Water Vapor Propellant
John E. Brandenburg[1], Kyle Platt[1], John Kline[2], and Dan Sullivan[2]
[1]Florida Space Institute and University of Central Florida, Kennedy Space Center
[2]Research Support Instruments, Princeton NJ

5D6: Self Organization in Cathode Boundary Layer Discharges
K.H. Schoenbach, M. Moselhy, N. Takano, A. Mohamed, and R. Bentley
Center for Bioelectrics, Old Dominion University, Norfolk, VA 23510

5D7: Rotating Plasma Discharges of Molecular Radiators Using Circularly Polarized Microwaves
Jin Joong Kim, Jung Tae Ko, and Dong Ho Won
Department of Optical Engineering, Sejong University

5D8: The Non-Locality of Striation Phenomenon in Plasma Display Panel
Yen-Cheng Ho and Keh-Chyang Leou
Department of Engineering and System Science, National Tsing Hua University, Hsinchu 300, Taiwan, Republic of China

5D9: Fabrication of Lateral DC Plasma Display Panels on Flexible Substrates
R. Tarighat, B. Arvan, M. Monavary, S. Mohajerzadeh, A. Goodarzi, and M. Yousefi
Thin Film Lab., Dept. Elect. & Comp. Eng., University of Tehran, Tehran, Iran

9:30 Wednesday, June 30, 2004 **Constellation Ballroom A**

Poster Session 5P1-9: Basic Phenomena - II

5P1: Optical, Wave Measurements, and Modeling of Helicon Plasmas Over a Wide Range of Magnetic Fields
C. Mark Denning, Shane M. Tysk, John E. Scharer, Siqi Luo, and Kamran Akhtar
Electrical and Computer Engineering Department, University of Wisconsin-Madison 53706

5P2: Theory of Plasma Antenna Windowing
Ted Anderson and Igor Alexeff
University of Tennessee, Knoxville, Tennessee

5P3: Wave Energies and Nonthermal Power Dissipation in a Plasma Penetrated by a Scattered Relativistic Beam
J. Guillory[1], D.V. Rose[2], J. H. Beall[3,4,5]
[1]School of Computational Sciences, George Mason University, Fairfax, VA
[2]Mission Research Corp., Albuquerque, NM
[3]St. John's College, Annapolis MD; Code 7650
[4]E.O. Hulburt Center for Space Research, Naval Research Laboratory, Washington, DC
[5]School of Computational Sciences, George Mason University, Fairfax, VA

5P4: Plasma Turbulence and Percolation Effects
O.G. Bakunin
Russian Research Center, Kurchatov Institute, Nuclear Fusion Institute.

5P5: Anomalous Structure in Drift-Wave Turbulence
F. Skiff and A. Diallo
Department of Physics and Astronomy, University of Iowa

5P6: The Hall Instability in Inhomogeneous Low-Density Warm Plasmas
Michael Mond and Edward Liverts
Department of Mechanical Engineering, Ben-Gurion University of the Negev, P.O.Box 653, Beer-Sheva 84105, Israel

5P7: Microwave Measurement of Decaying Plasma in Liquid Helium
K. Minami[1], C. Kojima[1], S. Komatsu[1] and Osamu Ishihara[2]
[1]Graduate School of Science and Technology, Niigata Univ., Niigata 950-2181 Japan
[2]Faculty of Engineering, Yokohama National University, Yokohama 240-8501 Japan

5P8: Polarized Bremsstrahlung Generated by Interaction Ion Beam and Some Crystals
I.B. Khakbediev[1], A.P. Potylistyn[2]
[1]Samarkand State University, University Blvd. 15, Samarskand, Uzbekistan
[2]Nuclear Physics Institute of Tomsk Polytechnic University, Tomsk, Russia

5P9: STM and STS Studies of Terraces on Si(5 5 12) Surface with Ag Atom Adsorption
J.Zhang[1,2], S.H.Cho[2], W.X.Quan[2], Y.Z.Zhu[2], and J.M.Seo[2]
[1]Dept. of Physics, Yunnan University, Kunming, P.R. China
[2]Dept. of Physics, Chonbuk National University, Chonju, Korea

Poster Session 5P10-19: Computational Plasma Physics

5P10: Two Dimensional PIC-MCC Calculation of a CCRF Discharge in Methane: Transition Between Different Modes
I.V.Schweigert and A.L. Alexandrov
Institute of Theoretical and Applied Mechanics, 630090 Novosibirsk, Russia

5P11: Rydberg Plasma State Diagram from Cryogenic Temperatures to 1000K.
V.S. Filiniov, V.E. Fortov, E.A. Manykin, B.B. Zelener, and B.V. Zelener
United Institute of High Temperature, Russian Academy of Science, Ijorskaia str. 13/19, Moscow, Russia 125412

5P12: Numerical Model of Microwave-Induced Gas Breakdown
N. Bruner[1], T. Genoni[1], T. Hughes[1], D. Welch[1], A. Schulz[2], and K. Cartwright[2]
[1]Mission Research Corporation
[2]Air Force Research Laboratory

5P13: An Analysis of the Basic Space Charge Limited Emission Algorithm in a Finite Element Electrostatic Gun Code
Eric M. Nelson[1] and John J. Petillo[2]
[1]Los Alamos National Laboratory
[2]Science Applications International Corp.

5P14: Development of a 3D Finite Element Particle-In-Cell Code with Adaptive Meshing
Thuc Bui[1], Lawrence Ives[1], John Verboncoeur[2], and Charles Birdsall[2]
[1]Calabazas Creek Research, Inc. 20937 Comer Drive, Saratoga, USA
[2]Department of Electrical Engineering and Computer Sciences University of California

5P15: Space-Charge-Limited Emission Models for Particle Simulation
J.P. Verboncoeur[1], K.L. Cartwright[2], and T.Murphy[2]
[1]Dept. NE, Univ. of California, Berkeley, CA 94720-1730
[2]Air Force Research Laboratory, Kirtland AFB, NM

5P16: Simulation of Turbulence and Transport for Tokamak Plasmas in General Geometry
Yang Chen and Scott E. Parker
Center for Integrated Plasma Studies, University of Colorado at Boulder

5P17: Hybrid Particle-Fluid Modeling of Plasmas
A.E. Schulz, A.D. Greenwood, K.L. Cartwright, and P.J. Mardahl
Air Force Research Laboratory, Directed Energy Directorate, Kirtland AFB, NM 87117

5P18: Analysis of Adaptive Mesh Refinement Methods for FDTD Particle-in-Cell Techniques for EM Simulations
Matthew Bettencourt, Chris Lenyk, and Tim Fleming
Air Force Research Laboratory, 3550 Aberdeen Ave SE Kirtland AFB NM 87117

5P19: New Complex Basis Functions for Variational Calculation Coulomb Systems.
O.N. Yusupov
Samarkand State University

Poster Session 5P20-31: Fast-Wave Devices

5P20: Stability and Tunibility of Gyrotron Backward-Wave Oscillator
C.T. Fan[1], K.F. Pao[1], T.H. Chang[1], K.R. Chu[1], and S.H. Chen[2]
[1]Department of Physics, National Tsing Hua University, Hsinchu, Taiwan
[2]National Center for High Performance Computing, Hsinchu, Taiwan

5P21: Effects of External Reflections on Gyrotron Backward Wave Oscillators
S.H. Chen[1], C.C. Chiu[2], and T.H. Chang[2]
[1]National Center for High Performance Computing, Hsinchu, Taiwan
[2]Department of Physics, National Tsing Hua University, Hsinchu, Taiwan

5P22: High-Efficiency Operation of the Relativistic X-Band Gyrotron with Strong Output Reflections
R.M. Rozental, E.V. Ilyakov, I.S. Kulagin, N.I. Zaitsev, and N.S. Ginzburg
Institute of Applied Physics, Russian Academy of Sciences, Russia, Nizhny Novgorod, 603950, GSP-120, Ulyanova str., 46

5P23: Three-Dimensional Particle-in-Cell Calculations of an Over-Moded W-Band Gyrotron
John J. Watrous and Michael F. Frese
NumerEx, 2309 Renard Place SE, STE 220, Albuquerque, NM 87106 USA

5P24: Simulations of a 95GHz, 100kW CW CW Gyrotron Interaction Cavity Using 3D PIC
Peter Mardahl[1], Keith Cartwright[1], and Jack Watrous[2]
[1]Air Force Research Laboratory 3550 Aberdeen Ave. SE Kirtland AFB, NM 87117
[2]NumerEx 2309 Renard Place SE, Suite 220 Albuquerque, NM 87106

5P25: 34 GHz Cusp Gun Driven Peniotron
L.J. Dressman[1,2], D.B. McDermott[1], Y. Hirata[1], D.A. Gallagher[3], T.A. Spencer[4], and N.C. Luhmann, Jr.[1]
[1]Department of Applied Science, University of California at Davis, Davis, CA 95616
[2]Crane Division, Naval Surface Warfare Center, (NSWC Crane), Crane IN
[3]Northrop Grumman Corp., Rolling Meadows, IL
[4]Air Force Research Lab, Directed Energy Directorate, NM

5P26: Effect of Operation of a Buncher Cavity at the Second Cyclotron Harmonic on the Gyroklystron Efficiency
O.V. Sinitsyn, J. Rodgers, G.S. Nusinovich and V.L. Granatstein
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, Maryland 20742

5P27: Initial Design Data for the Second Harmonic, 1MW, 15GHz Gyrotron for Plasma Heating at the NSTX Tokamak
M. Yeddulla, G.S. Nusinovich and T.M. Antonsen, Jr.
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD 20742-3511

5P28: Progress in The Development of a High Power Gyroklystron for Accelerator Applications
E.S. Gouveia, W. Lawson, B. Hogan, K. Bharathan, and V.L. Granatstein
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD 20742

5P29: The Design of Space-Charge Limited MIGs with Control Grids for Gyroklystron Applications
W. Lawson and H. Raghunathan
Department of Electrical and Computer Engineering and Institute for Research in Electronics and Applied Physics University of Maryland, College Park, MD 20742

5P30: Stochasticity of Electron Trajectories in Relativistic Gyro-Devices
R. Ngogang, G.S. Nusinovich, T.M. Antonsen, Jr. and V.L. Granatstein
Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, 20742-3511

5P31: Nonlinear Dynamics in a Free Electron Laser Amplifier with Electromagnetic Pumping
T.V. Dmitrieva, and N.M. Ryskin
Saratov State University, 155, Moskovskaya str., Saratov, 410012, Russia

Poster Session 5P32-41: Inertial Confinement Fusion; High Energy Density Hydrodynamics and Equation of State

5P32: Cumulation and Acceleration of Ions by TW Femtosecond Laser Impulse
V.A. Balakirev, A.N. Dovbnya, M.A. Krasnogolovets, I.N. Onishchenko, and N.I. Onishchenko, A.I. Povrozin, and V.I. Pristupa
NSC "Kharkov Institute of Physics and Technology", Ukraine

5P33: The "BAIKAL" Project – 10 MJ X-Ray Generator for ICF
E. V. Grabovski
State Research Center of Russian Federation, Troitsk Institute for Innovation and Fusion Research (SRC RF TRINITI), Troitsk, Moscow reg., Russia

5P34: Spectroscopic Analysis of Non-LTE Gold Plasmas
S.B. Hansen, R.F. Heeter, M.E. Foord, K.B. Fournier, D.H. Froula, A.J. MacKinnon, M.J. May, M.B. Schneider, and B.K.F. Young
Lawrence Livermore National Laboratory, P.O. Box 808, L-472; Livermore, CA 94550

5P35: Simulation of Beam Compression for Heavy-Ion Fusion
W.M. Sharp[1], J.J. Barnard[1], D.P. Grote[1], C.M. Celata[2], S.S. Yu[2], D.V. Rose[3], and D.R. Welch[3]
[1]LLNL; [2]LBNL; [3]MRC

5P36: Combined Electro-Discharge Accelerator
A.V. Budin, Ph.G. Rutberg, and A.F. Savvateev
IPE RAS, Dvortsovaya nab. 18, St. Petersburg, Russia

5P37: Thermodynamic Properties and Plasma Phase Transition in Dense Hydrogen Mixtures
V.S. Filinov[1], M. Bonitz[2], V.E.Fortov[1], and P.R. Levashov[1]
[1]Institute for High Energy Densities, Institute for High Temperatures Scientific Association, Russian Academy of Sciences, Izhorskaya ul. 13/19, Moskow, 127412 Russia
[2]Christian-Albrechts -Universitaet zu Kiel, Institut fuer Theoretische Physik und Astrophysik, Lehrstuhl Statistische Physik, Leibnizstrasse 15, 24098 Kiel, Germany

5P38: Initial Investigation of an Air Plasma Z-Pinch
J.W. Luginsland, M.H. Frese, S.D. Frese, and R.E. Parkinson
NumerEx, 2309 Renard Place SE, Suite 220, Albuquerque, NM 87106

5P39: Radiation Hydrodynamics in a Foam-Filled Hohlraum Heated by Multi-Kilojoule One Micron Light on the Omega Laser Facility
Anthony L. Peratt, Joyce Guzik, and Steve Batha
Los Alamos National Laboratory, Los Alamos, New Mexico 87545 USA

5P40: Equation of State and Transport Properties of Low Z Materials at Extreme Pressure
G. W. Collins[1], J. Eggert[1], P. M. Celliers[1], D. Hicks[1], D. Bradley[1], S. J. Moon[1], W. Unites[1], P. Loubeyre[2], R. Jeanloz[3], R. McWilliams[3], and K. M. Lee[3]
[1]Lawrence Livermore National Laboratory, Livermore, CA USA
[2]C.E.A. Bruyeres, France
[3]University of California, Berkeley

5P41: MHD Simulation of High Current Initiation of Segmental Metallic Rods
Sherry D. Frese, Michael H. Frese, and John W. Luginsland
NumerEx

Poster Session 5P42-54: Medical, Biological, and Environmental Applications - II

5P42: Effects of High Temperature Ion Implantation on Titanium Nitride Coated Carbide Cutting Tools
D.L. Tang[1], L.R. Shen[1], S.H. Pu[1], F.X. Yan[1], Q.C. Chen[1], and P.K. Chu [2]
[1]Southwestern Institute of Physics, Chengdu, China
[2]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong

5P43: Improved Corrosion Resistance of Plasma Carbon Coated NiTi Orthopedic Materials
R.W.Y. Poon[1], X.Y. Liu[1], C.Y. Chung[1], P.K. Chu[1], K.W.K. Yeung[2], W.W. Lu[2], and K.M.C. Cheung[2]
[1]Department of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]Department of Orthopedic Surgery, University of Hong Kong, Pokfulam, Hong Kong

5P44: Rat Osteoblasts Growth on Surface of Plasma-Sprayed Bioceramic Coatings
X. Y. Liu[1,2], C. X. Ding[1], and P. K. Chu[2]
[1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 Dingxi Road, Shanghai 200050, China
[2]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong

5P45: Calcium Doped Diamond-like Carbon Films Fabricated by Plasma Immersion Ion Implantation
S.C.H. Kwok[1], P.K.Chu[1], M.M.M. Bilek[2], and D.R. McKenzie[2]
[1]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]School of Physics, The University of Sydney, NSW 2006, Australia

5P46: Enhancement of Biocompatibilility of Diamond-like Carbon Films Implanted with Phosphorus Utilizing Pulsed High-Voltage Glow Discharge Plasma Immersion Ion Implantation and Deposition
S.C.H. Kwok[1], P.K. Chu[1], M.M.M. Bilek[2], and D.R. McKenzie[2]
[1]Dept of Physics & Materials Science, City University of Hong Kong, Kowloon, Hong Kong
[2]School of Physics, The University of Sydney, NSW 2006, Australia

5P47: Biological Effect of Nitrogen Doped Diamond-Like Carbon Films for Biomedical Applications
P. Yang[1,2], N. Huang[1], S.C.H. Kwok[2], Y.X. Leng[1], J.Y. Chen[1], J. Wang[1], Y. Leng[3], and P.K. Chu[2]
[1]Department of Materials Engineering, Southwest Jiaotong University, Chengdu, 610031, China
[2]Department of Physics and Materials Science, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon, Hong Kong, China
[3]Department of Mechanical Engineering, Hong Kong University of Science & Technology, Clear Water Bay, Kowloon, Hong Kong, China

5P48: The Comparative Research on Plasma Polymerization of Different Organic Monomer
C.J. Pan, N. Huang, R.R. Liu, J. Wang, and H. Sun
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Materials Processing of Chinese Education Ministry, Southwest Jiaotong University, Chengdu 610031, Sichuan, China

5P49: Studying of the Effects of Bias Voltage on Structure, Mechanical Properties and Adhesion Behavior of Blood Platelet of Diamond-Like Carbon Films
F. Wen, N. Huang, H. Sun, Y. X. Leng
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Materials Processing of Chinese Education Ministry, Southwest Jiaotong University, Chengdu, Sichuan 610031, China

5P50: Immobilization of Biological Macromolecule on Titanium Oxide Film to Improve the Biocompatibility
F.J. Jing, N. Huang, J.Y. Chen, Y.X. Leng, J. Wang, G.J. Wan, P. Yang, H. Sun, A.S. Zhao
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Materials Processing of Chinese Education Ministry, Southwest Jiaotong University, Chengdu, Sichuan 610031, China

5P51: Effect of Characteristics on the Behavior of Cultured Human Umbilical Vein Endothelial Cells (HUVEC) onto Titanium Oxide Film Surface Fabricated by Plasma Immersion Ion Implantation and Deposition (PIIID)
J.Y. Chen[1], G.J. Wan[1,2], Y.X. Leng[1], P. Yang[1], H. Sun[1], J. Wang[1], N. Huang[1], and P.K. Chu[2]
[1]Key Lab. of Advanced Material Processing of Chinese Education Ministry. Southwest Jiaotong University, Chengdu, 610031, China
[2]Department of Physics & Materials Science, City, University of Hong Kong, Kowloon, Hong Kong

5P52: In Vivo Anticoagulation of Titanium Oxide Film Coated Coronary Artery Stent Prepared by Plasma Immersion Ion Implantation and Deposition
N. Huang, Y.X. Leng, P. Yang, J.Y. Chen, H. Sun, J. Wang, G.J. Wan, A.S. Zhao, P.K. Chu
Key Lab. of Surface Modification of Artificial Organs, Lab. of Advanced Material Processing of Chinese Education Ministry. Southwest Jiaotong University,
Chengdu, 610031, China

5P53: The Microstructure and Properties of Titanium Oxide Deposited at Different Substrate Temperature and Bias Voltage by Pulse Vacuum Arc Plasma Deposition
Y.X. Leng , P. Yang, J.Y. Chen, G.J.Wan, H. Sun, N.Huang
School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu, 610031, China

5P54: Enhancement of Surface Properties in Metals via PSII
Jeehyun Kim[1], S.A. Nikiforov[1], Geun-Hie Rim[1], Hoon Lee[2], and Saeyoung Ahn[3]
[1]Korea Electrotechnology Research Institute, 28-1, Seongju-dong, Changwon, Gyeongnam, Korea
[2]Solco BioMedical Institute
[3]College of Natural Sci., Seoul National University, Seoul, Korea

5P55: Surface Sterilization with High Energy Ions
L. Meixler and J. Schmidt
Princeton Plasma Physics Laboratory

1:30 Wednesday, June 30, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Edl Schamiloglu, University of New Mexico

PSAC Award presented by:
Thomas Hussey - Chair, PSAC/EXCOM

Plenary Talk - PL6:

2004 Plasma Science and Applications Award Address

The X Pinch, a Remarkable X-ray Source and High-Energy-Density Plasma

David Hammer
Cornell University

3:00 Wednesday, June 30, 2004 **Constellation Ballroom C**

Chairperson: Alexander Velikovich, Naval Research Laboratory

Oral Session 6A: Fast Z-Pinches - II

6A1: Corona-Free Explosion of the Coated Tungsten Wires in Vacuum
G.S. Sarkisov[1], S.E. Rosenthal[2], K.W. Struve[2], D.H. McDaniel[2]
[1]Ktech Corporation, Albuquerque, USA
[2]Sandia National Laboratories, Albuquerque, USA

6A2: Implosion Time Circuit Optimization Study of ICF Wire Array Loads for Sandia ZR Facility
Eduardo M. Waisman[1], Michael E. Cuneo[2], Daniel B. Sinars[2], Henry C. Harjes[2], William A. Stygar[2], Kenneth W. Struve[2], and David D. Hinshelwood[3]
[1]Consultant, Sandia National Laboratories
[2]Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185-1193
[3]Naval Research Laboratory, Washington DC, USA

6A3-4: Laser Examination of Wire Array Dynamics on Z
D.E. Bliss[1], C.A. Coverdale[1], M.E. Cuneo[1], B.M. Jones[1], T.J. Nash[1], S.T. Rogowski[1], T.W. Sanford[1], and G.S. Sarkisov[2]
[1]Sandia National Laboratories, PO Box 5800, Albuquerque, NM 87185-1194
[2]Ktech Corporation 2201 Buena Vista SE, Albuquerque, NM 87106-4265

6A5: Stability of Wire Array Z-Pinch in the 100ns to 1μs Implosion Time Scales
F. Hamann, C. Mangeant, F. Lassalle, F. Bayol, and H. Calamy
Centre d'Etudes de Gramat, 46500 Gramat, France

6A6: Heating of the On-Axis Plasma in Long-Implosion Plasma Radiation Sources
A. Chuvatin[1], L. I. Rudakov[2], A. L. Velikovich[3], J. Davis[3], and V. I. Oreshkin[4]
[1]Ecole Polytechnique, Palaiseau, France
[2]Berkeley Scholars, Inc., Springfiled, VA
[3]Plasma Physics Division, Naval Research Laboratory, Washington, DC
[4]High Current Electronics Institute, Tomsk, Russia

6A7: Argon Z-Pinch Experiments with Large Diameter Nozzles
J.S. Levine, J.W. Banister, B.H. Failor, N. Qi and H.M. Sze
Titan Corporation/Pulse Sciences Division 2700 Merced Street, San Leandro, CA 94577

6A8: Continued Development of a 12-cm-Diameter Nozzle for Argon Z-Pinches
P. Coleman, A. Bixler, A. Gerhan, M. Krishnan, J. Thompson, and K. Wilson
Alameda Applied Sciences Corp., 2235 Polvorosa Ave., Suite 230, San Leandro, CA 94577 USA

6A9: 12 cm Diameter Gas Puff Density Profile Measurements Using Planar Laser Induced Fluorescence
N. Qi[1], B. H. Failor[1], J. W. Banister[1], J. S. Levine[1], P. G. Steen[1], H. M. Sze[1], and A. Wilson[2]
[1]Titan Corporation/Pulse Sciences Division, 2700 Merced Street, San Leandro, CA 94577
[2]Avonia, San Diego, CA 92130

6A10: Influence of Density Non-Uniformity in Gas Puff Z-Pinch Behavior
Andrew Wilson[1] and Paul Steen[2]
[1]Avonia Inc., 13631 Old El Camino Real, San Diego, CA 92130
[2]Titan Corporation, Pulse Sciences Division, 3033 Science Park Road, San Diego, CA 92121

3:00 Wednesday, June 30, 2004 **Constellation Ballroom D**

Chairperson: Scott Robertson, University of Colorado, Boulder

Oral Session 6B: Partially Ionized Gases

6B1-2: An Experimental Model of Ball Lightning
Igor Alexeff[1], Sriram Parameswaran[1], Magesh Thiyagarajan[1] and Michael Grace[2]
[1]University of Tennessee, Knoxville,
[2]Puriscal, Costa Rica

6B3: Study of the Surface Discharge on Ferroelectrics
A. Dunaevsky and N. J. Fisch
Princeton Plasma Physics Laboratory, Princeton, NJ 08536

6B4: Anomalous Viscosity in Partially Ionized Gases
Ady Hershcovitch
Brookhaven National Laboratory Upton, New York 11973 USA

6B5: Partially-Ionized Gases in Heavy-Ion Fusion Accelerators
P. Stoltz[1], A. Friedman[2], and J.L. Vay[2], R. Cohen[3], A. Molvik[3], and J. Verboncoeur[4]
[1]Tech-X Corporation
[2]Lawrence Berkeley National Laboratory
[3]Lawrence Livermore National Laboratory
[4]University of California, Berkeley

6B6: Presheath Environment in Weakly Ionized Multi-Species Plasmas
Noah Hershkowitz, Eunsuk Ko, and Xu Wang
Dept. of Engineering Physics University of Wisconsin – Madison, Madison, WI 53706

6B7: Asymptotic Matching of Plasma Bulk and Sheath: Convergence Properties and Approximation Failure
Ralf Peter Brinkmann
Ruhr-Universität Bochum; Germany

6B8: Characterization of α and γ Modes in Radio-Frequency Nonthermal Atmospheric Plasmas
J.J. Shi and M.G. Kong
Department of Electronic and Electrical Engineering, Loughborough University, Loughborough, LE11 3TU, UK

3:00 Wednesday, June 30, 2004 **Constellation Ballroom E**

Chairperson: Arne Fliflet, Naval Research Laboratory

Oral Session 6C: Microwave Systems

6C1: High-Power Rapid Microwave Annealing of Si
Keith Thompson[1,2], John H. Booske[2], John Lohr[3], Lawrence Ives[1], Yurii Gorelov[3], and Ken Kajiwara[3]
[1]Calabazas Creek Research, Inc., 20937 Comer Drive, Saratoga, CA 95070
[2]ECE Dept, University of Wisconsin, Madison, 53706
[3]General Atomics, PO Box 85608, San Diego CA 92186

6C2: Joining of Ceramic Tubes Using a High-Power 83-GHz Millimeter-Wave Beam
R.W. Bruce[1], R.L. Bruce[1], D. Lewis, III[2], S. H. Gold[2], M. Kahn[3], A.K. Kinkead[4], A.W. Fliflet[2], and M.A. Imam[5]
[1]RWBruce Associates Inc., Arnold, MD; [2]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[3]ICARUS research Inc., Bethesda, MD; [4]Leading Edge Technologies, Washington, DC
[5]Material Science and Technology Division, Naval Research Laboratory, Washington, DC 20375

6C3-4: Material Processing in Electric and Magnetic Fields at Microwave Frequencies in a Single Mode Cavity
D. Agrawal, Rustum Roy, R. Peelamedu, J. P. Cheng, and Y. Fang
Materials Research Institute, Pennsylvania State University, University Park, PA USA

6C5: Status of the 10 MW 140 GHz, CW ECRH System for the Stellarator W7-X
M. Thumm[1,2], G. Dammertz[1], V. Erckmann[3], G. Gantenbein[4], W. Kasparek[4], H.P. Laqua[4], G. Michel[3], W. Leonhardt[1], G. Mueller[4], G. Neffe[1], and M. Schmid[1]
[1]Forschungszentrum Karlsruhe, Association Euratom-FZK, IHM, Postfach 3640, D-76021 Karlsruhe, Germany
[2]Universitaet Karlsruhe, Institut fuer Hoechstfrequenztechnik and Elektronik, Kaiserstr. 12, D-76128 Karlsruhe, Germany
[3]Max-Planck-Institut fuer Plasmaphysik (IPP), Wendelsteinstr. 1, D-17491 Greifswald, Germany
[4]Institut fuer Plasmaphysik, Universitaet Stuttgart, Pfaffenwaldring 31, D-70569 Stuttgart, Germany

6C6: Progress in the New ECRH System for ASDEX Upgrade
F. Leuterer[1], G. Gruenwald[1], F. Monaco[1], M. Muenich[1], H. Schuetz[1], F. Ryter[1], D. Wagner[1], R. Wilhelm[1], H.Zohm[1], T. Franke[1], M. Thumm[2], G. Dammertz[2], H. Heidinger[3], K. Koppenburg[2], X. Yang[2], W. Kasparek[4], G. Gantenbein[4], H. Hailer[4], G.G. Denisov[5], A. Litvak[5], and V. Zapevalov[5]
[1]Max Planck Institut fuer Plasmaphysik, D-85748 Garching, Germany
[2]Forschungszentrum Karlsruhe, Institut fuer Hochleistungsimpuls- und Mikrowellentechnik, Postfach 3640, D-76021 Karlsruhe, Germany
[3]Forschungszentrum Karlsruhe, Institut fuer Materialforschung, Postfach 3640, D-76021 Karlsruhe, Germany
[4]Institut fuer Plasmaforschung, Universitaet Stuttgart, D-70569 Stuttgart, Germany
[5]Institute of Applied Physics, RAS, 603600 Nizhny Novgorod, Russia

6C7: Observation of Multipactor in an 11.424-GHz Dielectric-Loaded Accelerating Structure
S.H. Gold[1], W. Gai[2], J.G. Power[2], A.K. Kinkead[3], R. Konecny[2], C. Jing[2], W. Liu[2], and Z.M. Yusof[2]
[1]Plasma Physics Division, Naval Research Laboratory, Washington, DC 20375
[2]High Energy Physics Division, Argonne National Laboratory, Argonne, IL 60439
[3]LET Corporation, Washington, DC 20007

6C8: Quasi-Optical System for Converting Gyrotron Output into Gaussian Beam
I. Ogawa[1], T. Idehara[1], Y. Itakura[1], H. Ando[1], D. Wagner[2], and M. Thumm[3]
[1]Research Center for Development of Far-Infrared Region, Universityof Fukui, Fukui 910-8507, Japan
[2]Max-Planck-Institut für Plasmaphysik, Garching, D-85748, Germany
[3]Institut für Hochleistungsimpuls- und Mikrowellentechnik Forschungszentrum Karlsruhe, P.O. Box 3640, D-76021 Karlsruhe, Germany

3:00 Wednesday, June 30, 2004 **Constellation Ballroom F**

Chairperson: Eduardo Waisman, Consultant

Oral Session 6D: Pulsed-Power Applications of Plasmas - II; Vacuum Power Conditioning and Other Emerging Concepts

6D1: **Overview of Recent Results from the Triggered Plasma Opening Switch Experiment**
D.P. Jackson[1,2], M.E. Savage[1], M. Gilmore[2], D.B. Seidel[1], C.W. Mendel[1], and R. Sharpe[1]
[1]Sandia National Laboratories
[2] University of New Mexico

6D2: **The Importance of Low Inductance, Low Resistive Phase Switches in Compact Pulse Power Systems**
W. C. Nunnally, N. E. Islam, and D. Cooperstock
University of Missouri – Columbia, Columbia, MO 652211

6D3: **Investigation of the Flow of Ions in Plasma Opening Switch**
R. Doron[1], D. Osin[1], R. Arad[1], K. Tsigutkin[1], M. Platkov[1], Y. Maron[1], and A. Fruchtman[2]
[1]Faculty of Physics, Weizmann Institute of Science, Rehovot, Israel
[2]Holon Academic Institute of Technology, Holon, Israel

6D4: **High-Pressure Liquid Cooling for High Repetition-Rate Capacitors**
Robert J Vidmar
University of Nevada, 5625 Fox Ave, Reno, NV 89506 USA

6D5: **Network Cables Under Lightning Pulse: Electromagnetic Topology Analysis**
Phumin Kirawanich, Rahul Gunda, Nakka Kranthi, and Naz Islam
Department of Electrical and Computer Engineering, University of Missouri, Columbia, Missouri, USA 65211

6D6: **Transient Plasma Ignition of Quiescent and Flowing Fuel Mixtures**
F. Wang, JB Liu, J. Sinibaldi, C. Brophy, A. Kuthi, C. Jiang, P. Ronney, and M.A. Gundersen
University of Southern California, Los Angeles, CA 90089-0271

6D7: **Corona Discharge under Supercritical Conditions**
Evgeniya Lock, Alexei Saveliev and Lawrence Kennedy
Department of Mechanical Engineering (M/C 251), Univeristy of Illinois at Chicago, 842 W. Taylor Street, Chicago, IL 60607-7022 USA

6D8: **Oil-Solid Surface Flashover Phenomena with Sub-Microsecon Pulse Excitation**
Archana Sharma[1], S. Acharya[1] K.V. Nagesh[1], R.C. Sethi[1], Udaya Kumar[2], and G.R. Nagabhushana[2]
[1]Accelerator and Pulse Power Division, BARC,Mumbai, India,
[2]Department of High Voltage Engineering, Institute of Science, Bangalore, India

6D9: **Radioactive Resistance of Some Commercial Gas Filled Surge Arresters in γ and X-Rays Field**
Boris Loncar[1], Predrag Osmokrovic[2], Dušan Matijaševic[2], and Srboljub Stankovic[3]
[1]Faculty of Technology and Metallurgy, University of Belgrade, Serbia and Montenegro
[2]Faculty of Electrical Engineering, University of Belgrade, Serbia and Montenegro
[3]Institute of Nuclear Sciences "Vinca", Belgrade, Serbia and Montenegro

3:00 Wednesday, June 30, 2004 **Constellation Ballroom A**

Poster Session 6P1-10: Slow-Wave Devices - II

6P1: Numerical Study on the Noise in 10-Vane Strapped Magnetron Oscillator
J.I. Kim[1], J.H. Won[1], H.J. Ha[2], J.C. Shon[2], and G.S. Park[1]
[1]School of Physics, Seoul National University, Seoul, 151-742, Korea
[2]Samsung Electronics, Suwon, Korea

6P2: Numerical Simulations of the Nonlinear Evolution of the Magnetron instability for Several Geometric Configurations
Chri Lenyk, Tim Fleming, and Keith Cartwright
Air Force Research Lab

6P3: Non-Linear Memory Effects and Digital Communications in a Simplified Klystron Configuration
J.P. Calame, B.G. Danly, and B. Levush
Naval Research Laboratory, Washington, DC 20375

6P4: Excitation of Monotron Oscillations in Overmoded Klystrons
G.S. Nusinovich, M.E. Read, L. Song and R.L. Ives
Calabazas Creek Research, Inc., Saratoga, CA, 95070-3753

6P5: Self-Modulation and Chaos in Delayed-Feedback Klystron Oscillators
N.M. Ryskin, and A.M. Shigaev
Saratov State University, Saratov 410012 Russia

6P6: Analytical Investigation of Two Electron Beams Reversely Traveling in the Coupled-Cavity of Klystron Oscillator
Y.M. Shin, S.T. Han, S.G. Jeon, K.H. Jang, J.K. So, G.S. Park
School of Physics, Seoul National University, Seoul, Korea

6P7: Intense Electron Beam Produced by Magnetron Gun for Slow Wave Devices
A.N. Kuleshov, and B.P. Yefimov
Institute for Radiophysics and Electronics of NAS of Ukraine

6P8: The Range of Validity of the Rayleigh Hypothesis
T. Watanabe[1], Y. Choyal[2], K. Minami[3], and V. L. Granatstein[4]
[1]Theory and Data Analysis Div., National Inst. for Fusion Science,Toki, 509-5292, Japan
[2]School of Physics, Devi Ahilya Univ. Indore, 452 017 India
[3]Graduate School of Science and Tech., Niigata Univ., Niigata, 950-2181 Japan
[4]Inst. for Research in Electronics and Appl. Phys., Univ. of Maryland, College Park, MD 20742 USA

6P9: MAGIC 2D Simulation of Nonstationary and Chaotic Processes in a Relativistic Backward Wave Oscillator
Y.B. Kang[1], G.S. Park[1], N.M. Ryskin[2], and V.N. Titov[2]
[1]School of Physics, Seoul National University, Korea,
[2]Saratov State University, Saratov, Russia

6P10: Absolute Instability for a Plasma Filled Rippled Wall Rectangular Waveguide Backward Wave Oscillator Driven by Sheet Electron Beam
Arti Gokhale[1], J. Mondal[1], K.C. Mittal[2], Y. Choyal[1], and K.P. Mahehswari[2]
[1]Accelerator and Pulse Power Division, Bhabha Atomic Research Center, Trombay, Mumbai, India 400085
[2]D.A. University. Khandwa Road Indore (M.P.), India 420167

Poster Session 6P11-21: Magnetic Fusion Energy, Alternate Concepts

6P11: Preliminary Numerical Modelling of the LICA (Linearly Injected Coaxial Accelerator)
I. Shinton
Institute of Fundamental Sciences, Massey University Albany, New Zealand

6P12: Field Gradient Dependence for Fusion Self-Heating in MTF Targets
Ronald C. Kirkpatrick
Los Alamos National Laboratory

6P13: A Study of the Magnetized Coaxial Gun Operation Driving a Spheromak in the Presence of a Rotating n=1 Asymmetry
C.T. Holcomb[1], T.R. Jarboe[2], D.N. Hill[1], S. Woodruff[1], R.D. Wood[1], H.S. McLean[1], B.W. Stallard[1], and E.B. Hooper[1]
[1]Lawrence Livermore National Laboratory, Livermore, CA 94550
[2]Aeronautics and Astronautics Department, University of Washington, Seattle, WA 98195

6P14: Comparison of Theory and Experiment on Electron Cyclotron Emission from Spherical Tori
J. Preinhaelter[1], V. Shevchenko[2], M. Valovic[2], P. Pavlo[1], L. Vahala[3], G. Vahala[4], J. Urban[1], and the MAST Team[2]
[1]Euratom/IPP, Prague, Czech Republic
[2]Euratom/UKAEA, Culham, UK
[3]ECE, Old DominionUniversity, Norfolk, VA
[4]Physics, William & Mary, Williamsburg, VA

6P15: "Optical" Soft X-Ray Arrays For Fluctuation Diagnostics in MFE Experiments
L.F. Delgado-Aparicio, D. Stutman[1], M. Finkenthal[1], K. Tritz[1], H.W. Moos[1], R. Kaita[2], and R. Majeski[2]
[1]Plasma Spectroscopy Group, Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, Maryland 21218
[2]Princeton Plasma Physics Laboratory (PPPL), Princeton University, Princeton, New Jersey 08540

6P16: Soft X-ray Tomography on NSTX
K. Tritz, D. Stutman, L. Delgado-Aparicio, and M. Finkenthal
Plasma Spectroscopy Group, Department of Physics and Astronomy, The Johns Hopkins University, Baltimore, MD

6P17: Dependence of Edge Fluctuations on the Disruption in Tokamak Plasmas
Pejman Khorshid[1], Long Wang[2], X.Z. Yang[2], and C.H. Feng[2]
[1]Department of Physics, Islamic Azad University, Mashhad, Iran
[2]Institute of Physics, Chinese Academy of Sciences, Beijing,China

6P18: Heavy Ion Beam Probe Development
K.A. Connor, D.R. Demers, X. Zhang, J. Lei, J.G. Schatz, P.M. Schoch, U. Shah, J. Si, and C. Ling
Rensselaer Polytechnic Institute, Troy, NY

6P19: Progress on Turbulence Imaging and Visualization Diagnostics for High Temperature Plasmas in Toroidal Devices
H. Park[1], I.G.J. Classen[2], C.W. Domier[3], A.J.H. Donne[2], M.Johnson[3], N.C. Luhmann, Jr.[3], E. Mazzucato[1], T. Munsat[1], M.J. van de Pol[2], J. Wang[3], and Z. Xia[3]
[1]PPPL, Princeton University
[2]FOM Institute, the Netherlands
[3]UC at Davis

6P20: MTF Investigations with Shiva-Star: Formation and Translation of an FRC into an Imploding Solid Liner with Deformable Contacts
Gerald G. Craddock Jr.[1], Michael H. Frese[1], Sherry D. Frese[1], James H. Degnan[2], and Norman F. Roderick[3]
[1]NumerEx
[2]Air Force Research Laboratory, Directed Energy Directorate
[3]University of New Mexico

6P21: MEIEC (Microwave Enhancement of Inertial Electrostatic Confinement) Fusion: Fabrication, Modeling, and Data Analysis
Marin Racic[1], John E. Brandenburg[1], Lee Caraway[2], and Brian Wright[2]
[1]Florida Space Institute
[2]Florida Institute of Technology

Poster Session 6P22-29: Thermal Plasma Chemistry and Processing - II

6P22: Effect of L-C Syntony on Micro-gap Dielectric Barrier Discharge at Ambient Pressure
Zhitao Zhang, Mindi Bai, Xiyao Bai, Bo Yang, Yang Xu
Key laboratory of strong electric-field ionization discharge of Liaoning Province, Dalian Maritime University, Dalian 116026, Liaoning, P. R.China

6P23: Temporal Characteristic of Discharge Pulse vs Gas Flow Rate in Dielectric Barrier Discharge
Zhiguo Mao, Lifang Dong, Zengqian Yin, and Junxia Ran
College of Physics Science and Technology, Hebei University, Baoding 071002, China

6P24: Research on Power Supply Used in Dielectric Barrier Discharge
Yanchang Peng, Ping Yan, Jue Wang, and WeiQun Yuan
Institute of Electrical Engineering, Academia Sinica , China

6P25: Experimental Research on Microdischarge Characteristics of DBD
Ping Yan, WeiQun Yuan, Jue Wang, and Yanchang Peng
Institute of Electrical Engineering, Academia Sinica , China

6P26: Investigation of DBD for Wool Fabric: Depending on Experimental Parameters
S. Korkmaz , L. Oksuz, S. Helhel
S.Demirel University, Department of Physics, Isparta Turkey

6P27: Atmospheric Microwave Discharges for Plasma Treatment of Fibers
K.W. Hemawan, T.A. Grotjohn, and J. Asmussen
Department of Electrical and Computer Engineering, Fraunhofer Center for Coating and Laser Applications, Michigan State University, East Lansing, MI 48824

6P28: Surface Modification of Carbon Fiber by DBD
Y.P. Hu[1,2], L.Yan[1], Z.Q. Li[2]
[1]Wuhan University of Technology, 430063 China
[2]Dalian Maritime Univeristy, 116026 China

6P29: Transitional Arc Discharges- Reactor Design & Applications
Chiranjeev S Kalra, Young I Cho, Alexander Gutsol and Alexander Fridman
Drexel University, Philadelphia, PA 19104

Poster Session 6P30-39: Diagnostics of Processing Plasmas

6P30: Analysis of Optical Emission Spectroscopy from arcs for plasma vitrification of hazardous wastes
A. Rodríguez-Yunta, C. Pardo, and M.A.G. Calderón
University of Cantabria, Santander, Spain

6P31: The Diagnosis of Electron Temperature in Dielectric Barrier Discharge at Atmospheric Pressure
Junxia Ran, Lifang Dong, Zhiguo Mao, and Zengqian Yin
College of Physics Science & Technology, Hebei University, Baoding 071002, P.R. China

6P32: Radial Profiles of Neutral Argon in a Helicon Source
A.M. Keesee and E.E. Scime
West Virginia University

6P33: Stark-Zeeman Effect and Diagnostics of the Poloidal Magnetic Fields in Tokamaks
V.F. Tuganov
State Research Center, Troitsk Innovation and Fusion Research Institute, Russia

6P34: A Crystal Spectrograph and Its Application in Plasma Focus
G.. X . Zhang[1], M.H. Liu[2], S. Lee[2], and P. Lee[2]
[1]Tsinghua University
[2]Nanyang Technological University

6P35: An Optimized Frequency of Dielectric Barrier Discharge Analyzed by Difference of Voltage and Current
S.G. Kim[1], H.H. Choe[1], Bong-Chul Jang[2], Yun-Hwan Kim[2], Gon-Ho Kim[3], D. Y. Kim[4], B. Karunagaran[4], and Junsin Yi[4]
[1]R&D Center, Samsung Electronics Co., San#24 Nongseo-Ri, Giheung-Eup, Yongin-City, Gyeonggi-Do, Korea
[2]Dept. of Physics, Hanyang Univ., Kyeonggi-Do, Ansan, 425-791, Korea
[3]Dept. of Nuclear Engineering, Seoul National Univ., Seoul, 151-741, Korea
[4]School of Information and Communication Engineering, Sungkyunkwan Univ., 300 Chunchun-dong, Jangan-gu, Suwon, Kyunggi-do 440-746, Korea

6P36: The Measurement of Ion Flow Velocity by Mach Probes in Unmagnetized Plasmas
Eunsuk Ko, Xu Wang, and Noah Hershkowitz
Dept. of Engineering Physics, University of Wisconsin – Madison, Madison, WI 53706

6P37: Experimental Investigation of a Low-Pressure N2-O2 Microwave Discharge
J. Henriques[1,2] and A. Ricard[1]
[1]CPAT, Université Paul Sabatier, 118 rte de Narbonne, 31062 Toulouse, France
[2]Centro de Física dos Plasmas, Instituto Superior Técnico, 1049-001 Lisboa, Portugal

6P38: Synthesis and Characterization of Hollow Nanoparticles In Rf Dusty Plasma
Themis Matsoukas[1] and Jin Cao[2]
[1]Department of Chemical Engineering, Pennsylvania State University
[2]Air Products Inc.

6P39: Measurement of Density and Conductivity in DC Plasma by RF Probe in Different Conditions
F. Bahadori, M. Ghoranneviss, and M. Mahmoudzadeh
Plasma Physics Research Lab., P.O. Box 14155-7574, Tehran, Iran

Poster Session 6P40-50: High-Density/Pulsed Plasma Diagnostics

6P40: Calibration of a Detector for Measuring DD Fusion Neutrons Based on the $^{9}Be(n,\alpha)^{6}He$ Reaction
Alan Nelson[1], Gary Cooper[1], Carlos Ruiz[2], James Franklin[3], Daniel Casey[1], Lee Ziegler[4], and Chris Hagen[4]
[1]University of New Mexico, Albuquerque NM 87131
[2]Sandia National Laboratories, Albuquerque NM 87185-1196
[3]K-Tech Corp, Albuquerque NM 87110
[4]Bechtel Nevada, Las Vegas NV 89030

6P41: Comparison of Computational and Experimental Neutron Detector Response and Ion Temperature Measurements Using MCNPX and OMEGA Experimental Data
J.R. Starner[1], G.W. Cooper[2], C.L. Ruiz[1], J.K. Franklin[3], R.J. Leeper[1], and T.A. Mehlhorn[1]
[1]Sandia National Laboratories, Albuquerque, New Mexico, 87185
[2]University of New Mexico, Albuquerque, New Mexico, 87131
[3]K-Tech Corporation, Albuquerque, New Mexico, 87106

6P42: Characterization of a Time Resolved Diagnostic for Measuring Source Spot Size
S. Portillo[1], D. Rovang[1], J. Maenchen[1], D. Droemer[2], S. Lutz[2], I. McKenna[2], P. Watts[2], and D. V. Rose[3]
[1]Sandia National Laboratories, Albuquerque, NM 87185 USA
[2]Bechtel Nevada Corp., Albuquerque, NM 87185 USA
[3]Mission Research Corp., Albuquerque, NM 87110 USA

6P43: Plasma Light Diagnostic for PWFA at SLAC
E. Oz[1], S. Deng[1], T. Katsouleas[1], P. Muggli[1], C.D. Barnes[2], C. O'Connell[2], F.J. Decker[2], P. Emma[2], M.J. Hogan[2], R. Iverson[2], P. Krejcik[2], R.H. Siemann[2], D. Walz[2], C.E. Clayton[3], C. Huang[3], D.K. Johnson[3], C. Joshi[3], W. Lu[3], K.A. Marsh[3], and W.B. Mori[3]
[1]University of Southern California
[2]Stanford Linear Accelerator Center
[3]University of California, Los Angeles

6P44: Collective Scattering Technique for Sub-Millimeter Wavelength Fluctuation Detection in a Helicon Plasma
R. Hardin[1], E. Scime[1], C. Biloiu[1], and J. Heard[2]
[1]Physics Department, West Virginia University, Morgantown, WV 26506
[2]Physics Department, Clarion College, Clarion, PA

6P45: Electrical Breakdown in Transformer Oil

Michael D. Cevallos, James C. Dickens, Andreas A. Neuber, and Hermann G. Krompholz
Center for Pulsed Power and Power Electronics, Depts. of Computer & Electrical Engineering and Physics, Texas Tech University, Lubbock TX 79409-3012

6P46: Nanosecond, Optical Diagnostics for Liquid Dielectric Switches

J.F. Kolb[1], S. Xiao[1], B. Goan[1], X.P. Lu[1], K.H. Schoenbach[1], M. Laroussi[1], J.P. Joshi[1], J. Dickens[2], A. Neuber[2], H. Krompholz[2], M. Cevallos[2], and M. Butcher[2]
[1]Center for Bioelectrics, Old Dominion University, Norfolk, Virginia 23510
[2]Center for Pulsed Power and Power Electronics, Departments of Electrical & Computer Engineering and Physics, Texas Tech University, Lubbock, Texas 79409

6P47: Moving Double Probe Measurements in Copper Arc Plasma and Derivation of Plasma Parameters

S.C.Danaraddi
Department of Physics, Basaveshwar Science College, Bagalkot-587 101, Karnataka State, India

6P48: Temporal Measurements of Spectral Lines Emission from Deuterium Discharges in RPI-IBIS Facility

E. Skladnik-Sadowska[1], K. Czaus[1], K. Malinowski[1], M.J. Sadowski[1], T. Pisarczyk[2], A.V. Tsarkenko[3]
[1]The Andrzej Soltan Institute of Nuclear Studies (IPJ), 05-400 Otwock-Swierk, Poland
[2]Institute of Plasma Physics and Laser Microfusion (IPPLM), 00-908, Warsaw, Poland
[3]Institute of Plasma Physics, 61008, Kharkow, Ukraine

6P49: Inverse Diffraction Problem for the Non-Stationary Layered Plasma Formations and their Characterization by Pulsed THz-Wave Beam

S. Zhilkov[1], A. Nerukh[2], N. Sakhnenko[2], and E. Aleksandrova[3]
[1]AccelBeam Photonics LLC, 201 Ironwood Circle, Elkins Park, PA 19027
[2]National University of Radioelectronics, 14 Lenin Avenue, Kharkov, 61166, Ukraine
[3]Consultant

6P50: Blue Diode Spectroscopy in a Plasma Focus Device

By M Mathuthu and T G Zengeni
University of Zimbabwe, Physics Department, P O Box MP 167, Mt Pleasant, Harare, Zimbabwe

8:00 Thursday, July 1, 2004 **Constellation Ballrooms C, D, E, and F**

Chairperson: Mark Kushner, University of Illinois

Plenary Talk - PL7:

Plasma Physics on the Factory Floor: Things the Textbooks Never Worry About

William Holber
MKS Power and Reactive Gas Products

9:30 Thursday, July 1, 2004 **Constellation Ballroom C**

Chairperson: Christine Coverdale, Sandia National Laboratories

Oral Session 7A: Fast Z-Pinches - III, Dense Plasma Focus; High Energy Density Hydrodynamics and Equation of State

7A1: Results of Explosively-Driven Isentropic Compression Experiments (HEPP-ICE)
D. Tasker, F. Abeyta, J. Arellano, D. Dennis, J. Goforth, D. Herrera, J. King, J. McGuire, H. Oona, P. Rigg, F. Sena, L. Tabaka, and D. Torres
University of California, Los Alamos National Laboratory

7A2: Neon Z-pinch Experiment on Hawk
D.P. Murphy[1], R.J. Commisso[1], D. Mosher[2], D.G. Phipps[2], D.M. Ponce[3], S.J. Stephanakis[2], B.V. Weber[1], F. C. Young[2], and N. Qi[4]
[1]Naval Research Laboratory, Washington, DC
[2]Titan/Jaycor, Reston, VA
[3]National Research Council Research Associate
[4]Titan/Pulsed Sciences Division, San Leandro, CA

7A3: First Microsecond K-Shell PRS Experiments on the GIT-12 Generator
A.V.Shishlov, R.B.Baksht, S.A.Chaikovsky, A.V.Fedunin, F.I.Fursov, V.I.Kokshenev, N.E.Kurmaev, A.Yu.Labetsky, V.I.Oreshkin, and A.G.Russkikh
Institute of High Current Electronics, Tomsk, Russia

7A4: Neutron Diagnostic Calibration at TAMU Plasma Focus
B.L. Freeman, R.L. Hardy, J.M. Ferguson, B.A. Lindeburg, A.D. Luginbill, and J.C. Rock
Texas A&M University College Station, Texas 77843-3133

7A5: Soft X-Ray Production with Long Implosion Time (800ns) Aluminum Nested Wire Arrays Z-Pinches at Centre d'Etudes de Gramat
F. Bayol[1], C. Mangeant[1], F. Lassalle[1], F. Hamann[1], P. L'Eplattenier[1], G. Avrillaud[2], J.P. Bedoch[1], J.F. Cambonie[1], Y. Cazal[1], P. Combes[1], A. Morell[1], and S. Ritter[1]
[1]Centre d'Etudes de Gramat, 46500 Gramat, France
[2]ITHPP, 46500 Thegra, France

7A6: Effect of Sparkgap Breakdown and Current Buildup Speed on the pinch Dynamics in Filippov-Type Plasma Focus Experiments
A. R. Babazadeh[1], M. Emami[2], S. Khorasani[3], S. M. Sadat Kiai[2], M. V. Roshan[2]
[1]Dept. of Physics, Qom University, P.O.Box 37165, Qom, Iran
[2]NFRC, A.E.O.I, P.O.Box 14155-1339, Tehran, Iran
[3]Dept. of Electrical Engineering, Sharif University of Technology P.O. Box 11365-9363, Tehran, Iran

7A7: Electric Discharge in Hydrogen of Super-high Density at the Current Up to 500 kA
A.A. Bogomaz, A.V. Budin, M.E Pinchuk, Ph.G. Rutberg, A.F. Savvateev
IPA RAS, Dvortsovaya nab 18, St. Petersburgh, Russia

9:30 Thursday, July 1, 2004 **Constellation Ballroom D**

Chairperson: Karl Schoenbach, Old Dominion University

Oral Session 7B: High Pressure, Non-Equilibrium Plasmas

7B1-2: Physics and Applications of the Gliding Arc Discharge
Alexander Fridman
Drexel University

7B3: Inactivation of Airborne Bacterial Endospores with OAUGDP
R. Domitrovic, S. South, D. Sherman, and K. Kelly-Wintenberg.
Atmospheric Glow Technologies, Knoxville TN

7B4: Streamer Discharges for Water Purification
M.A. Malik, Y. Minamitani, S. Xiao, J.F. Kolb, S. Beebe, and K.H. Schoenbach
Center for Bioelectrics, Old Dominion University and Eastern Virginia Medical School, Norfolk, Virginia 23510

7B5: Two-Dimensional Modeling of Spontaneous Pattern Formation in Dielectric-Barrier Discharge System for Polymer Film Treatment.
Alexandre Chirokov[1], Kamilla Iskenderova[1], Alexander Gutsol[1], Alexander Fridman[1], Kurt D. Sieber[2], and Jeremy M. Grace[2]
[1]Drexel Plasma Institute
[2]Eastman Kodak Company

7B6: Plasma Treatment of a Heated Diesel/Steam Mixture for Use in Ship Service Fuel Cell Systems
D. Dietz[1], H. Ghezel-Ayagh[2], J. Hunt[2], A. Belkind[1], K. Becker[1], and A. Nickens[3]
[1]Center for Environmental Systems (CES), Stevens Institute of Technology, Hoboken, USA
[2]FuelCell Energy, Inc., Danbury, CT, USA
[3]Office of Naval Research, Arlington, VA, USA

7B7: Synthesis of Ammonia and Liquid Fuel by CH4 and N2 Plasmas without Catalyst at Ambient Pressure and Temperature
Mindong Bai, Xiyao Bai, Ning Wang, Dongmei Zhang, and Keping Zhan
Environmental Engineering Institute, Dalian Maritime University, Dalian 116026, Liaoning, P.R. China

7B8: Effect of Relative Humidity on Electron Distribution and Ozone Production by DC Coronas in Air
Junhong Chen and Pengxiang Wang
Department of Mechanical Engineering, University of Wisconsin-Milwaukee, Milwaukee, WI 53201

7B9: The Role of ALFT as a Commercial Supplier of Soft X-Ray Sources for the Medical, Biological Fields, and Nanotechnology
Emilio Panarella
ALFT Inc. 349 Terry Fox Drive Ottawa, Ontario K2K 2V6 Canada

9:30 Thursday, July 1, 2004 **Constellation Ballroom E**

Chairperson: John Verboncoeur, University of California, Berkeley

Oral Session 7C: Computational Plasma Physics; Basic Phenomena - II; Dusty Plasmas - II

7C1: **δf Simulation of Tearing Mode Instability**
W. Wan, Y. Chen and S. E. Parker
University of Colorado, Boulder, CO 80309

7C2: **Unstructured 3d Pic/DSMC Modeling of Feep Thruster Backflow Contamination**
Anton Spirkin and Nikolaos A. Gatsonis
Mechanical Engineering Department, Worcester Polytechnic Institute, Worcester, MA 10609

7C3: **Grid-Free Particle Simulation of a 1D Bounded Plasma Coupled to an External Driving Circuit**
A.J. Christlieb[1], R. Krasny[1], and J.P. Verboncoeur[2]
[1]University of Michigan, Department of Mathematics, Ann Arbor, MI 48109-1109 USA
[2]Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA 94720-1770 USA

7C4: **Propagator Methods for Plasma Simulations: Application to Breakdown**
C. Wichaidit and W.N.G. Hitchon
Department of Electrical and Computer Engineering, University of Wisconsin, Madison, WI 53706

7C5: **Operation and Performance of a 3D Finite Element Charged Particle Code with Adaptive Meshing**
Lawrence Ives[1], Thuc Bui[1], William Vogler[1], Andrew Bauer[2], Mark Shephard[2], and Mark Beall[3]
[1]Calabazas Creek Research, Inc., 20937 Comer Drive, Saratoga, USA
[2]Scientific Computational Research Center, Rensselear Polytechnic Institute, Albany, NY
[3]Simmetrix, Inc.

7C6: **Different Modes of a Capacitively Coupled Radio Frequency Discharge in Methane**
I.V.Schweigert
Institute of Theoretical and Applied Mechanics, 630090 Novosibirsk, Russia

7C7: **A Study of Korteweg de-Vries, Modified Korteweg de-Vries and Kadomtsev-Petviashvili Solitons in a Multispecies Collisionless Weakly Relativistic Plasma**
Tarsem Singh Gill, Harvinder Kaur, and Nareshpal Singh Saini
Department of Physics, Guru Nanak Dev University, Amritsar-143005, India

7C8: **Self-Focusing and Self-Phase Modulation of an Elliptic Gaussian Laser Beam in Collisionless Magnetoplasma**
Nareshpal Singh Saini and Tarsem Singh Gill
Department of Physics, Guru Nanak Dev University, Amritsar-143005, India

7C9: **Rocket-Born Instrument to Detect Charged Smoke and Cloud Particles in the Mesospheric Region**
Zoltán Sternovsky, Scott Robertson, and Mihály Horányi
Physics Department, University of Colorado, Boulder, CO 80309 – 0390

7C10: **Dynamic Effects of Electron Heating on Polar Mesospheric Clouds**
Y. S. Dimant[1] and G. M. Milkh[2]
[1]Boston University, Boston, MA
[2]University of Maryland, College Park, MD

9:30 Thursday, July 1, 2004 **Constellation Ballroom F**

Chairperson: Neville Luhmann, University of California, Davis

Oral Session 7D: Slow-Wave Devices - II; Vacuum Microelectronics

7D1: Experimental Investigation of Miniaturized High Frequency Vacuum Tube
S.T. Han[1], K.H. Jang[1], J.K. So[1], Y.M. Shin[1], S G. Jeon[1], J.H. Kim[2], S.S. Chang[2], and G.S. Park
[1]School of Physics, Seoul National University, Seoul, Korea
[2]Pohang Accelerator Laboratory, Postech, Korea

7D2-3: Development of a Micromachined THz Nanoklystron: A Status Report
H.M. Manohara[1], P.H. Siegel[1], M.J. Bronikowki[1], B.K. Vancil[2], and K. Hawken[2]
[1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
[2]e beam, Inc., Beaverton, OR

7D4: Field Emitter Array Cathodes for High Current Density, High Current Applications
P.R Schwoebel, C.A Spindt, and C.E Holland
Microsystems Engineering Center, SRI International, Menlo Park, CA 94025

7D5: Growth and Patterning of Aligned Carbon Nanotubes for Applications to Cold Cathodes and Vacuum Electronics
Yonhua Tzeng, Chao Liu, and Yu-Chun Chen
Plasma Processing Laboratory, Alabama Microelectronics Science and Technology Center, Department of Electrical and Computer Engineering, Auburn University, Auburn, Alabama, USA

7D6-7: MM-Wave Sheet-Beam Traveling-Wave Tube Development at Los Alamos
B.E. Carlsten[1], S.J. Russell[1], L.M. Earley[1], J.M. Potter[2], P. Ferguson[3], and S. Humphries, Jr.[4]
[1]Los Alamos National Laboratory, Los Alamos, NM 87545
[2]J. P. Accelerator Works, Los Alamos, NM 87544
[3]MDS Company, Oakland, CA 94611
[4]Field Precision, Albuquerque, NM 87192

7D8: Synchronization and Generation of Chaos in a Driven TWT Amplifier with Delayed Feedback
C. Marchewka[1], P. Larsen[1], S. Bhattacharjee[1], J.H. Booske[1], N.M. Ryskin[2], and V.N. Titov[2]
[1]University of Wisconsin-Madison, Department of Electrical and Computer Engineering, 1415 Engineering Drive, Madison, WI 53706
[2]Saratov State University, Saratov, Russia

7D9: Synthesis of Radiation Spectrum in the Relativistic BWO
N.S. Ginzburg, R.M. Rozental, and A.S. Sergeev
Institute of Applied Physics, Russian Academy of Sciences, Russia, Nizhny Novgorod, 603950, GSP-120, Ulyanova str., 46

Poster Session 7P1-13: Space Plasmas

7P1: Ionospheric F-Layer Small-Scale Irregularities: A Possible Explanation
M.Bose
Deparment of Physics, Jadavpur University, Kolkata 700032; India

7P2: Coronal Mass Ejections and Magnetic Clouds Modeled as MHD Bounded States
V.A. Osherovich[1] and J. Fainberg[2]
[1]L3 Comm/ Goddard Space Flight Center, Greenbelt, MD
[2]NASA/Goddard Space Flight Center, Greenbelt, MD

7P3: Chaotic Scattering of Trapped Relativistic Electrons in the Magnetosphere by Whistler Waves
S.P. Kuo[1], Paul Kossey[2], James T. Huynh[3], and Steven S. Kuo[4]
[1]Department of Electrical & Computer Engineering, Polytechnic University, Six MetroTech Center, NY 11201
[2]Air Force Research Laboratory, AFRL/VSBX, Hanscom AFB, MA 01731
[3]Raytheon Space & Airborne Systems, El Segundo CA 90245
[4]Northrop Grumman Space Technology, One Space Park, Redondo Beach, CA 90278

7P4: Modeling Comet Ion Trails
E. Fichtl, K. Cartwright, P. Mardahl, A. Greenwood, and C. Fichtl
Air Force Research Lab

7P5: Orientation of Intense Z-Pinch Instabilities from an Intense Aurora as Recorded in Antiquity: Western USA
Anthony L. Peratt
Los Alamos National Laboratory, Los Alamos, New Mexico 87545 USA

7P6: Orientation of Z-Pinch Instabilities from an Intense Aurora as Recorded in Antiquity: South America
D. Scott[1] and A. L. Peratt[2]
[1]University of Massachusetts, Amherst
[2]Los Alamos National Laboratory, Los Alamos, New Mexico 87545 USA

7P7: EMHD Response of a Magnetoplasma to an External Current Source
W. Peter[1], T. Wallace[1], K. Papadopoulos[1,2], E. Kennedy[3], and G. Milikh[2]
[1]Advanced Technologies, BAE Systems, Washington DC 20037
[2]Dept. of Physics and Astronomy, University of Maryland, College Park, MD 20742
[3]Naval Research Laboratory, Washington DC 20375

7P8: Ion Heating Due to Alfvén Waves in a Helicon Plasma
C.S. Compton, C. Biloiu, A.M. Keesee E.E. Scime, and X. Sun
West Virginia University Department of Physics

7P9: Solar Energetic Particle Events from Energy-Dependent Charge States
Sujeet Kumar Mishra , D.P. Tiwari, and S.C. Kaushik
Department of Physics, A.P.S.University, Rewa, M.P.- INDIA 486 003

7P10: Astrophysical Aspects with Onsets and Release Time in the Studies of Solar Cosmic Rays
Sujeet Kumar Mishra, D.P. Tiwari, and S.C. Kaushik
Department of Physics, A.P.S.University, Rewa, M.P.- INDIA 486 003

7P11: Geomagnetic Field and Cosmic Ray Variation In Association With Solar Magnetic Flux
Sujeet Kumar Mishra and D.P.Tiwari
Department of Physics, A.P.S.University Rewa, M.P.- India 486 003

7P12: Geometric Considerations of the Evolution of Magnetic Flux Ropes
Daniel B. Berdichevsky[1,2]
[1]L-3 GSI, SSS, 1801 McCormick Dr., Largo, MD 20774
[2]NASA/GSFC, Mail Stop 690, Greenbelt, MD 20771

7P13: Diffusion and Transport in Collisional Magnetised Plasma with Temperature Anistropy
J.N. Mohanty[1], K.C. Baral[2], and Ganeswr Nath[3]
[1]Centre of Astrophysics, 438, Nua Sahi, Nayapalli, Bhubaneswar-751 012, India
2Department of Physics, Salipur College, Salipur, Cuttack-754 202, India
3Department of Engg.Physics, Dhaneswar Rath, Institute of Eng. & Management Studies, Tangi, Cuttack-754 022, India

Poster Session 7P14-25: Dusty Plasmas

7P14: New Results on the Ion Drag Force in Complex Plasmas
S. Khrapak, A. Ivlev, S. Zhdanov, and G. Morfill
Centre for Interdisciplinary Plasma Science, Max-Planck-Institut für Extraterrestrische Physik, D-85741 Garching, Germany

7P15: Hydrodynamics and Structure of Dusty Plasma Fluid
Oleg F.Petrov, Andrey V.Gavrikov, Iya A.Shakhova, Olga S.Vaulina, Pavel R.Levashov and Vladimir E.Fortov
Institute for High Energy Densities, Russian Academy of Sciences, Moscow, Russia

7P16: Attractive Interactions Between Negatively Charged Dust Particles in a Plasma
G. A. Hebner and M. E. Riley
Sandia National Laboratories, Albuquerque NM 87185-1423

7P17: Dispersion Properties in a Complex Plasma with Varying Size Dust Population
K.Qiao, B.Smith, T. Hyde, L. Matthews, J. Reay, M. Cook, and J. Schmoke
Center for Astrophysics, Space Physics and Engineering Research (CASPER)
Baylor University, Waco, TX 76798-7310, USA

7P18: Layer Structures and the Vertical Dust Lattice Instability in a Confined Plasma Crystal
Ke Qiao and Truell W. Hyde
Center for Astrophysics, Space Physics and Engineering Research (CASPER),
Baylor University, Waco, Texas 76798-7310, USA

7P19: Phase Transitions in a Non-Monodisperse Dusty Plasma
B. Smith, T. Hyde, L. Matthews, J. Reay, M. Cook, and J. Schmoke
Center for Astrophysics, Space Physics and Engineering Research (CASPER)
Baylor University, Waco, TX 76798-7310, USA

7P20: Electron Beam Action on Dust Structures in Plasma
L.M. Vasilyak, M.N. Vasil'ev, S.P. Vetchinin, D.N. Polyakov and V.E. Fortov
Institute for High Energy Densities of Associated Institute for High Temperatures of Russian Academy of Sciences, 125412 Moscow, Russia

7P21: Experimental Determination of Dust Particle Charge at Elevated Pressures
S. Ratynskaia[1], S. Khrapak[1], M. H. Thoma[1], M. Kretschmer[1], R. A. Quinn[1], G. E. Morfill[1], A. Zobnin[2], A. Usachev[2], O. Petrov[2], and V. Fortov[2]
[1]Centre for Interdisciplinary Plasma Science, Max-Planck Institut fur extraterrestrische Physik, Postfach 1312, D-85741 Garching, Germany
[2]Institute for High Energy Densities, Russian Academy of Sciences, Izhorskaya 13/19, 125412, Moscow, Russia

7P22: Vertical Wave Packets in Two-Dimensional Strongly Coupled Complex (Dusty) Plasma
D. Samsonov, S. Zhdanov, and G. Morfill
Max-Planck-Institut fur Extraterrestrische Physik, D-885740, Garching, Germany

7P23: The "Trampoline Effect" and the Distribution of Forces Inside the Void Region in Complex Plasmas Under Microgravity Conditions
M. Kretschmer, S. Khrapak, S. Zhdanov, H. Thomas, G. Morfill, and the
PKE-Nefedov team
Centre for Interdisciplinary Plasma Science, Max-Planck-Institut für Extraterrestrische Physik, D-85741 Garching, Germany

7P24: Non-Ideal Effects in Streaming Dust Acoustic Instabilitiy
J. Puerta[1], E. Castro[1], P. Martín[1] and E. Valdeblanquez[2]
[1]Universidad Simón Bolívar, Departamento de Física, Apdo. 89000, Caracas 1080A, Venezuela.
[2]Universidad del Zulia, Departamento de Física, Facultad de Ingeniería, Apartado 4011-A 526, Maracaibo, Edo. Zulia, Venezuela

7P25: Wave propagation of a plasma crystal in a magnetic field
G.Uchida, U. Konopka, and G. Morfill
Center for Interdisciplinary Plasma Science, Max-Planck-Institut fuer Extraterrestrische Physik, D-85748 Garching, Germany

Poster Session 7P26-34: Laser-Driven and Plasma-Based Accelerators

7P26: Defining Optical Injector Parameters for Optimal Acceleration Bunches
J.H. Cooley[1,2], R.F. Hubbard[3], A. Zigler[1], D.F. Gordon[3], T.M. Antonsen Jr.[2], B. Hafizi[1], T.G. Jones[3], D. Kaganovich[4], P. Sprangle[3], A. Ting[3]
[1]Icarus Research, Inc., Bethesda, MD
[2]IREAP, University of Maryland, College Park, MD
[3]Plasma Physics Division, Naval Research Laboratory, Washington, DC
[4]LET Corp, Washington, DC

7P27: Gases of Exploding Clusters as a Nonlinear Optical Medium
Thomas Antonsen, Ayush Gupta, John Pallastro, and Howard Milchberg
University of Maryland, College Park MD 20742, Toshihiro Taguchi Setsunan University, Japan

7P28: Self-Guiding and Red Shifts of Intense Pulses Propagating Clustered Gases
V. Kumarappan[1], K.Y. Kim[1], A. Gupta[2], T. Antonsen[2], and H.M. Milchberg[1]
[1]IPST, University of Maryland, College Park, MD 20742
[2]IREAP, University of Maryland, College Park, MD 20742

7P29: Plasma Density Transition Trapping and Acceleration of Plasma Electrons in a Plasma Wakefield
M.C. Thompson[1], J.B. Rosenzweig[1], G. Travish[1], N. Barov[2], H. Edwards[3], P. Piot[3], J. Santucci[3]
[1]University of California, Los Angeles
[2]Northern Illinois University
[3]Fermi National Accelerator Laboratory

7P30: Anomalous Deceleration of Laser Pulse in the Dense Magnetized Plasma
V.B. Krasovitskii[1], Yu. Volkov[1], V.A. Turikov[1], V. Dorofeenko[2], V.I. Sotnikov[3], H. Ruhl[3], Y. Sentoku[3], and T. E. Cowan[3]
[1]Institute of Applied Mathematics, Moscow, Russia
[2]Institute of Advanced Studies, Vienna, Austria
[3]University of Nevada at Reno, NV 89557

7P31: Generation of Femtosecond Electron Bunches and Hard X-Rays by Ultra-Intense Laser Wake Field Acceleration in a Gas Jet
A. Zhidkov, M. Uesaka, T. Hosokai, and K. Kinoshita
University of Tokyo 22-2 Shirane -shirakata, Tokai, 319-1188, Japan

7P32: Influence of the Wake Wave on The Driver's Electrons
E.V. Rostomyan
Institute of Radiophysics and Electronics, National Ac. Sci., Armenia

7P33: Beam Halo Formation and Beam Loss Induced by Image-Charge Effects in a Small-Aperture Alternating-Gradient Focusing System
Jing Zhou[1], Chiping Chen[1], and B.L. Qian[2]
[1]Plasma Science and Fusion Center, Massachusetts Institute of Technology Cambridge, Massachusetts 02139
[2]Department of Applied Physics, National University of Defense Technology, Changsha, Hunan 410073, People's Republic of China

7P34: Frequency Up Shift of a High Intense Laser Pulse in a Gas Filled Capillary Plasma
Nitikant Viswakarma and A.K. Sharma
Center for Energy Studies, Indian Institute of Technology, New Delhi-110016, India

Poster Session 7P35-49: Pulsed-Power Applications of Plasmas - II

7P35: Shock Wave Generation by Underwater Discharge
A. Grinenko, A. Sayapin, S. Efimov, V. Ts. Gurovich, Ya.E. Krasik, and J. Felsteine
Physics Department, Technion, 32000 Haifa, Israel

7P36: Plasma Generation with a Thin-Wire Discharge for Use as Pseudospark Discharge Initiation
A. Kuthi, C. Jiang, and M. Gundersen
Department of Electrical Engineering – Electrophysics, University of Southern California, Los Angeles, CA 90089-0271

7P37: A Fast and Portable Mega-Volt Source for Pulsed Power Applications
Rishi Verma, A. Shyam, S. Chaturvedi, R. Kumar, D. Lathi, P. Sarkar, V. Chaudhary, Shukla R, K Debnath, J. Sonara, K. Shah, B. Adhikary, R Patel, T Jigna, and V Jignesh
Pulsed Power Group, Institute for Plasma Research, Bhat, Gandhinagar – 382428, Gujarat, India

7P38: Repetitive 600kV Vacuum Insulator Testing System for Insulator Areas on the order of 10^3 cm^2
B.S. Stoltzfus, J.M. Elizondo, M.E. Savage
Sandia National Laboratories

7P39: On High Gradient Insulators
John G. Leopold, Uri Dai, Yigal Finkelstein and Efraim Weissman
Applied and Technical Physics Department, RAFAEL, POBox 2250, Haifa 31021, Israel

7P40: Marx Generator Using Dense Plasma Switches
A. Kuthi, P. Gabrielson and M. Gundersen
Department of Electrical Engineering – Electrophysics, University of Southern California
Los Angeles, CA 90089-0271

7P41: High Repetition-Rate Liquid Cooled Capacitors
Robert J Vidmar
University of Nevada, 5625 Fox Ave, Reno, NV 89506 USA

7P42: Generation and Characterization of Micron and Submicron Particulate Using an Electrothermal Source
Karen R. Magid and Mohamed A. Bourham
Department of Nuclear Engineering, North Carolina State University, Raleigh, NC

7P43: Influence of the Electrode Parameters on the Pulse Shape Characteristic at Small Pressure and Inter-Electrode Gap Values
Predrag Osmokrovic[1], Boris Loncar[2], and Rajko Šašic[2]
[1]Faculty of Electrical Engineering, University of Belgrade, Serbia and Montenegro
[2]Faculty of Technology and Metallurgy, University of Belgrade, Serbia and Montenegro

7P44: Ar-Xe Laser Experiments on the Electra Rep-Rated Electron Beam Generator
J.L. Giuliani[1], J.P. Apruzese[1], M.C. Myers[1], D.D. Hinshelwood[1], G.M. Petrov[1], P. Kepple[1], J.D. Sethian[1], M.F. Wolford[2], F. Hegeler[3], D.M. Ponce[4], and T. C. Jones[5]
[1]Plasma Physics Division, Naval Research Laboratory
[2]Science Applications International, Corp.
[3]Commonwealth Technologies, Inc.
[4]National Research Council
[5]Research Support Instruments

7P45: Light-Matter Interaction in Transformer Oil
T. Namihira[1], D. Wang[1], A. Neuber[2], M. Butcher[2], J. Dickens[2], and H. Krompholz[2]
[1]Dept. of Electrical and Computer Engineering, Kumamoto University, 2-39-1 Kurokami, Kumamoto 860-8555, Japan
[2]Center for Pulsed Power and Power Electronics, Departments of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX 79409-3102

7P46: Magnetic Field Distribution in Combined Opening Switch (First Stage Acting)
O.G. Egorov
Troitsk Institute of Innovation and Fusion Research (TRINITI), Troitsk, Moscow reg., Russia, 142190

7P47: Frequency Blueshift During Laser-Induced Breakdown of Dielectrics
D.N. Gupta[1] and Nitikant Viswakarma[2]
[1]Department of Physics, Indian Institute of Technology, New Delhi-110016, India
[2]Centre for Energy Studies, Indian Institute of Technology, New Delhi-110016, India

7P48: Atmospheric Plasma Layer Generator by Dielectric Barrier Discharge for Application of Lighting Protection
Hongchun Zhuang, Yanming Jia, and Ping Yan
Institute of Electrical Engineering, Academia Sinica, China

7P49: Research on Plasma and Bubble Behavior of Pulsed Corona Discharge in Salt Water
Yao-hong Sun and Ping Yan
Institute of Electrical Engineering, Academia Sinica

Poster Session 7P50-55: Vacuum Power Conditioning and Other Emerging Concepts

7P50: Characterization of Pulse Induced Plasma Fueled by Aluminum Metallization
J.D. Buneo[1], J.L. Zirnheld[1], K.M. Burke[1], W.J. Sarjeant[1] M. Sussman[2], and C. Freund[2]
[1]Energy Systems Institute, University at Buffalo 312 Bonner Hall, Buffalo, NY 14260
[2]U.S. ARMY ARDEC, Advanced Energy Armament Systems Center Bldg. 65N, Picatinny Arsenal, NJ 07806

7P51: Phase Noise Reduction Technique for Pulsed TWT
Jae Seung Lee, Yehuda Goren, and N.C. Luhmann Jr.
University of California, Davis 95616
Teledyne Microwave Electronic Components, Rancho Cordova, CA 95742-6587

7P52: Application of ATLAS Pulsed Power System for Radiation Production Using a Plasma Opening Switch
Yahia Baghzouz
UNLV, 4505 S. Maryland Parkway, Las Vegas, NV 89119

7P53: Studies of Dielectric Breakdown Under Pulsed Power Conditions
P. Castro, M. Roybal, J. Buchenauer, J. Gaudet, and E. Schamiloglu
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, 87131 USA

7P54: Effects of Bending in a Stacked, Parallel-Plate Blumlein Pulse Forming Line
M. Joler, C.G. Christodoulou, J. Gaudet, and E. Schamiloglu
The University of New Mexico, Electrical and Computer Engineering Department, Albuquerque, New Mexico, USA

7P55: Current Multiplier for Better Generator-to-Load Coupling in Direct-Drive PRS Experiments
A.S. Chuvatin[1], L.I. Rudakov[2], B. Weber[3], R. Codièrgues[4], and F. Bayol[4]
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