SUMMARY OF TECHNICAL SESSIONS

Monday Morning, 6 June 1988
8:30 AM - Grand Ballroom C

REVIEW 1R

SUPERNOVA 1987a

R. McCray
Joint Institute for Laboratory Astrophysics
University of Colorado, Boulder, CO

Chairperson: A.L. Peratt

Monday Morning, 6 June 1988
9:40 AM - Cedar

Oral Session 1A: SPACE PLASMAS - I

Chairperson: A.L. Peratt

1A1 A TEMPORAL STUDY OF ELECTRON DYNAMICS AND TEMPERATURE IN THE NEAR WAKE OF A CONDUCTING BODY
M.A. Morgan, C. Chan, and R.C. Allen, Northeastern U., Boston, MA

1A2 POTENTIAL DOUBLE LAYER STRUCTURES IN THE WAKE OF AN OBJECT
S. Gabriel and P. Leung, Jet Propulsion Lab

1A3-4 Invited Paper
ELECTROMAGNETIC RADIATION FROM DOUBLE LAYER EMITTED BEAMS
J.E. Borovsky, Los Alamos Natl Lab, Los Alamos, NM

1A5 EXTENSION OF LOWER HYBRID DRIFT INSTABILITY INTO THE NEUTRAL SHEET OF THE EARTH'S MAGNETOTAIL
A.T.Y. Lui, Johns Hopkins U., Laurel, MD; and
A. Mankofsky, K. Papadopoulos, A. Drobot, Science Applications International Corporation, McLean, VA

1A6 FIELDS AND FLOWS IN DIFFUSING IONOSPHERIC PLASMAS
A. Kadish, Los Alamos National Lab, Los Alamos, NM

1A7 WHY WE NEED SEVERAL VLF ANTENNAS ON THE FARSIDE OF THE MOON
J. Kierein, Ball Aerospace, Boulder, CO

Monday Morning, 6 June 1988
9:40 AM - Douglas

Oral Session 1B: GASEOUS ELECTRONICS AND ARC TECHNOLOGY - I; Low Pressure Gaseous Electronics & Plasma-Boundary Modeling

Chairperson: P.F. Williams

1B1-2 Invited Paper
A REVIEW OF HIGH POWER HOLLOW ELECTRODE THYRATRON-TYPE SWITCHES
M.A. Gundersen, U. of Southern California, Los Angeles, CA

1B3 REVIEW ON HIGH POWER PSEUDO SPARK
W. Bauer, H. Ehrler, K. Mittag, N. Niessen, A. Rogner and Chr. Schultheiss, Kernforschungszentrum GmbH, Karlsruhe, FRG

1B4 DISCHARGE MODES IN A HOLLOW CATHODE GEOMETRY
M.T. Ngo, S.G.E. Pronko, K.H. Schoenbach, and G.A. Gerdin, Old Dominion U., Norfolk, VA; and
J. Lee, NASA Langley, Hampton, VA

1B5 ANODE SHEATH SOLUTIONS USING TESTING FUNCTIONS
O. Biblarz, GTE Products Corporation, Danvers, MA

1B6 A SELF-CONSISTENT MODEL OF THE CATHODE-FALL OF GLOW DISCHARGES
H. Chen and K.H. Schoenbach, Old Dominion U., Norfolk, VA

1B7 FLUCTUATING MACRO SURFACE CHARGES, AN ALGORITHM FOR SPACE CHARGE CALCULATIONS IN CURRENT SHEATHS
Chr. Schultheiss, Kernforschungszentrum GmbH, Karlsruhe, FRG

1B8 PLASMA FORMATION ON SURFACES BY MICROEXPLOSIONS AND UNIPOLAR ARCING
F. Schwirzke, Naval Postgraduate School, Monterey, CA

1B9 SCALING LAWS FOR ELECTRODE EROSION IN HIGH CURRENT, HIGH ENERGY SPARK GAPS
A.L. Donaldson and M. Kristiansen, Texas Tech U., Lubbock, TX

1B10 PLASMA SPUTTER DEPOSITION OF HIGH Tc SUPERCONDUCTING FILMS
C. Chan, Z.J. Jin, C. Whitaker, and R. Tarnowski, Northeastern U., Boston, MA

Monday Morning, 6 June 1988
9:40 AM - East Ballroom-A

Oral Session 1C: MICROWAVE-PLASMA INTERACTIONS - I

Chairperson: R.W. Schumacher

1C1-2 Invited Paper
THEORY OF MM WAVE PLASMA SOURCE EXPERIMENTS
M. Rosenberg and N.A. Krall, JAYCOR, San Diego, CA

1C3 SATURATION OF THE PLASMA-THREE-WAVE-MIXING PROCESS
J. Santoru and R.W. Schumacher, Hughes Research Lab, Malibu, CA

1C4 TURBULENT ELECTRIC FIELDS DURING STRONG BEAM-PLASMA INTERACTIONS: EXPERIMENT AND THEORY
G. Benford, A. Dovrat, D. Tzach, and D. Levron, U. of California, Irvine, CA

1C5 MICROWAVE GENERATION BY A BEAM-PLASMA INTERACTION IN A WAVEGUIDE
B.R. Poole, B. Chang, J.F. Camacho, Lawrence Livermore National Laboratory, Livermore, CA

1C6 ELECTRON PLASMA INTERACTIONS IN CROSSED FIELDS
D.J. Kaup, Clarkson University; and
L.A. Pitale, Villanova U., Villanova, PA

1C7 PHASE CONJUGATE REFLECTION OF ELECTROMAGNETIC WAVES FROM A PLASMA
D. Tzach, A. Fisher, N. Rostoker, G. Benford, and E. Garate, U. of California, Irvine, CA

1C8 CHAMBER EXPERIMENT FOR SIMULATING THE ARTIFICIAL IONIZATION LAYERS PRODUCED IN THE ATMOSPHERE BY TWO INTERSECTING MICROWAVE BEAMS
Y.S. Zhang and S.P. Kuo, Polytechnic U., Farmingdale, NY

1C9 STUDY OF THE PROPAGATION OF HIGH POWER MICROWAVE PULSE IN THE UPPER ATMOSPHERE
S.P. Kuo, Y.S. Zhang, Q.H. Ji, Polytechnic U., Farmingdale, NY

Monday Morning, 6 June 1988
9:40 AM - East Ballroom-B

Oral Session 1D: ION AND PLASMA SOURCES

Chairperson: A.L. Pregenzer

1D1-2 Invited Paper
SPECTROSCOPIC INVESTIGATIONS OF THE PLASMA BEHAVIOR AND THE ELECTRIC FIELD DISTRIBUTION IN HIGH POWER DIODES
Y. Maron, Weitzmann Institute of Science, Rehovot, Israel

1D3 PRODUCTION AND DIAGNOSIS OF A LITHIUM ANODE PLASMA SOURCE
G.C. Tisone and P.L. Dreike, Sandia Natl Lab, Albuquerque, NM

1D4 PULSED ION SOURCE WITH CRYOGENIC OR LASER-IRRADIATED ANODE
K. Kasuya, K. Horioka, H. Yoneda, Y. Kim, T. Saito, H. Sumitani, H. Tomita, and A. Sasaki, Tokyo Institute of Technology, Japan;
S. Teii, Y. Konya, and M. Nishina, Musashi Institute of Technology, Yokohama, Japan

1D5 LABORATORY-SCALE EHD AND FIELD-DESORPTION ION SOURCES FOR PULSED-POWER APPLICATIONS
J.A. Panitz, A.L. Pregenzer and R.A. Gerber, Sandia Natl Labs, Albuquerque, NM

1D6 ELECTRIC-FIELD RELATED ION PRODUCTION FROM LiF-COATED ANODES IN MAGNETICALLY INSULATED ION DIODES
A.L. Pregenzer, K.W. Bieg, R.E. Olson, D.K. Wiemann, and P.F. McKay, Sandia Natl Labs, Albuquerque, NM

1D7 LITHIUM ION SOURCE EXPERIMENTS ON PBFA II
K.W. Bieg, T.R. Lockner, J.R. Woodworth, A.L. Pregenzer, D.J. Johnson, C.L. Ruiz, R.J. Leeper, J.E. Maenchen, W.A. Stygar, P.F. McKay, T.A. Mehlhorn, R.E. Olson, and R.A. Gerber
Sandia Natl Labs, Albuquerque, NM

Monday Morning, 6 June 1988

Poster Session 1P1-8: BASIC PLASMA PHENOMENA - I

1P1 ELECTRON COLLISION FREQUENCY ENHANCEMENT AND RESISTIVE DRIFT WAVE TURBULENCE
P. Spence, S. Stafford, and J.R. Roth, U. of Tennessee, Knoxville, TN

1P2 LATEST EXPERIMENTAL RESULTS ON THE APPLICATION OF COLLISIONAL MAGNETIC PUMPING TO HEAT A STEADY STATE PLASMA
M. Laroussi and J.R. Roth, U. of Tennessee, Knoxville, TN

1P3 THE DIVERGENCE TERM OF THE CONTINUITY EQUATIONS FOR PARTIALLY IONIZED PLASMAS WITH LONG MEAN FREE PATHS
J.R. Roth, U. of Tennessee, Knoxville, TN

1P4 INTRODUCTION TO PLASMA ENGINEERING
J.R. Roth, U. of Tennessee, Knoxville, TN

1P5 ION ACOUSTIC WAVE ENHANCEMENT OF ELECTRON THERMAL CONDUCTIVITY
D.D. Needelman and R.L. Stenzel, U. of California, Los Angeles, CA

1P6 IN-SITU MEASUREMENT OF CURRENTS IN MAGNETIZED PLASMAS: CLOSURE, SPREADING, PROPAGATION SPEEDS
J.M. Urrutia and R.L. Stenzel, U. of California, Los Angeles, CA

1P7 MACROSCOPIC FLUID DESCRIPTION OF A PLASMA-NEUTRAL GAS TRANSITION
N.O. Fuentes, Comision Nacional Energia Atomica, Buenos Aires, Argentina

1P8 EXPERIMENTAL INVESTIGATION OF A LOCALIZED ELECTRON TEMPERATURE SPIKE PRODUCED BY ELECTRON CYCLOTRON WAVES
S.W. Lam, R. Mett, and J.E. Scharer, U. of Wisconsin, Madison, WI

Monday Morning, 6 June 1988

Poster Session 1P9-14: TOKAMAKS AND STELLARATORS - I

1P9 INITIAL OPERATION AND EXPERIMENTS IN THE ADVANCED TOROIDAL FACILITY
J.C. Glowienka, Oak Ridge National Lab, Oak Ridge, TN

1P10 VERTICAL MAGNETIC FIELDS AND EQUILIBRIUM CURRENTS IN THE PROTO-CLEO STELLARATOR
R.L. Bonomo and J.L. Shohet, U. of Wisconsin, Madison, WI

1P11 EFFECT OF ECH INDUCED ELECTROSTATIC POTENTIALS ON CONVECTIVE LOSS IN THE INTERCHANGEABLE MODULE STELLARATOR
C.A. Storlie, J.N. Talmadge, D.T. Anderson, F.S.B. Anderson, R.P. Doerner, J.L. Shohet and P.K. Trost, U. of Wisconsin, Madison, WI

1P12 ADVANCED HEATING TECHNIQUES FOR FORMATION OF HOT-ELECTRON PLASMAS IN TOKAMAKS AND STELLARATORS
B.H. Quon, R.A. Dandl, M.E. Fetzer, G.E. Guest and R.L. Miller, AMPC, Inc., Carlsbad, CA

1P13 SEARCH FOR FILAMENTARY STRUCTURES IN MAGNETICALLY CONFINED PLASMAS
I.H. Mitchell and C.B. Wheeler, Imperial College, London, UK

1P14 DENSITY AND SPACE POTENTIAL FLUCTUATION MEASUREMENTS IN TEXT USING A HEAVY ION BEAM PROBE DURING AN APPLIED RESONANT MAGNETIC FIELD
P.M. Schoch and R.L. Hickok, Rensselaer Polytechnic Institute, Troy, NY;
J.S. DeGrassie, T.E. Evans, and G.L. Jackson, GA Technologies, San Diego, CA;
S.C. McCool and A.J. Wootton, U. of Texas, Austin, TX; and
X.Z. Yang, Academia Sinica, Beijing, PRC

Monday Afternoon, 6 June 1988
2:00 PM - West Ballroom

PSAC AWARD ADDRESS: 2H

SERENDIPITY IS NO ACCIDENT, EVEN IN PLASMA RESEARCH

C.K. Birdsall
University of California, Berkeley, CA

Chairperson: J. Nation

Monday Afternoon, 6 June 1988
2:50 PM - Cedar

Oral Session 2A: TOKAMAKS AND STELLARATORS - II AND MAGNETIC FUSION EXPERIMENT DESIGN

Chairperson: J.L. Shohet

2A1 ORBIT EFFECTS ON IMPURITY TRANSPORT IN A ROTATING PLASMA
K.L. Wong and C.Z. Cheng, Princeton U., Princeton, NJ

2A2 DISRUPTION AND EDGE CURRENT
J.G. Murray, Cranbury, NJ

2A3 STATUS OF THE DESIGN AND CONSTRUCTION OF THE CPRF AND THE ZTH REVERSED FIELD PINCH EXPERIMENT
P. Thullin, K.F. Schoenberg, and J.N. DiMarco, Los Alamos National Lab, Los Alamos, NM

2A4 SRX-PRECURSOR TO LARGE SCALE HIGH BETA PLASMA DEVICES
H. Wexler, A.M.M. Todd, Grumman Corp. Research Center, Plainsboro, NJ;
G.A. Navratil, Columbia U., New York, NY

2A5 MICROWAVE FEL INTERACTIONS IN MTX
K.I. Thomassen, Lawrence Livermore National Lab, Livermore, CA

2A6 IDEAL MHD COMPUTATIONS NECESSARY FOR TOKAMAK DESIGN REALIZABILITY
F.J. Helton and J.M. Greene, General Atomics, San Diego, CA;
J.W. Helton, U. of California San Diego, LaJolla, CA

2A7 POLOIDAL FIELD COIL DESIGN CODE
C.C. Paulson and A.M.M. Todd, Grumman Aerospace Corporation, Plainsboro, NJ

NO SESSION 2B

Monday Afternoon, 6 June 1988
2:50 PM - East Ballroom-A

Oral Session 2C: ADVANCED THERMIONICS CONCEPTS

Chairperson: N.J. Dionne

2C1-2 Invited Paper
THERMIONIC SOURCE DESIGN
R. True, Litton Systems, San Carlos, CA

2C3 CROSSED-FIELD AMPLIFIERS AS RF DRIVERS FOR PARTICLE BEAM ACCELERATORS
N. Dionne, R. Edwards, R. Mallavarpu, Raytheon Co., Waltham, MA

2C4 CALCULATED PERFORMANCE OF THE LASERTRON VS. A TWO-CAVITY KLYSTRON
P.J. Tallerico, Los Alamos National Lab, Los Alamos, NM

2C5 THE EFFECTS OF SPACE-CHARGE FIELDS AND INTERACTION PHASE VELOCITY ON PENIOTRONS
J.M. Baird, R.C. Freudenberger, L.R. Barnett, and R.W. Grow, U. of Utah, Salt Lake City, UT

2C6 COAXIAL TWT MODE CONTROL
N.J. Dionne, Raytheon Co., Waltham, MA

Monday Afternoon, 6 June 1988
2:50 PM - East Ballroom-B

Oral Session 2D: BASIC PLASMA PHENOMENA - II

Chairperson: P.M. Bellan

2D1 ION BEAM FOCUSSING IN A DOUBLE PLASMA DEVICE WITH A LONGITUDINAL MAGNETIC FIELD
R.L. Merlino, J.C. Johnson, and N. D'Angelo, U. of Iowa, Iowa City, IA

2D2 ANOMALOUS ION TRANSPORT IN THE NEAR WAKE OF A MAGNETOPLASMA-OBSTACLE SYSTEM
D.P. Sheehan and R. McWilliams, U. of California, Irvine, CA

2D3-4 Invited Paper
FREE EXPANSION OF A TWO-ELECTRON-POPULATION PLASMA INTO VACUUM
G. Hairapetian and R.L. Stenzel, U. of California, Los Angeles, CA

2D5 RADIO FREQUENCY DISCHARGE OF HELIUM WITH TURBULENT FLOW-THEORY AND MEASUREMENTS
M.E. Talaat and P.J. Karditsas, U. of Maryland, College Park, MD

2D6 ON THE OVER-COLLECTION OF ELECTRONS BY HIGH VOLTAGE PROBES IN SPACE
D.L. Cooke, Hanscom AFB, MA; and
I. Katz, G. Jongeward, and M. Mandell, S-Cubed, LaJolla, CA

2D7 MEASUREMENTS OF STARK WIDTH OF SOME Ar I TRANSITIONS AND THE INVESTIGATION OF LTE IN AN ATMOSPHERIC DC ARGON PLASMA JET
V. Bakshi and R.J. Kearney, U. of Idaho, Moscow, ID

Monday Afternoon, 6 June 1988

Poster Session 2P15-28: PLASMA SOURCES AND DIODES

2P15 SPECTROSCOPIC INVESTIGATIONS OF THE PLASMA BEHAVIOR IN HIGH POWER DIODES
Y. Maron, E. Sarid, L. Perelmutter, M.E. Foord, M. Sarfaty, O. Zahavi, and E. Nahshoni, Weitzmann Institute of Science, Rehovot, Israel

2P16 DETERMINATION OF CONDITIONS IN A PLASMA-PREFILLED ION DIODE BY SPECTROSCOPIC TECHNIQUES
M.D. Coleman and D.A. Hammer, Cornell U., Ithaca, NY

2P17 SPECTROSCOPIC STUDY OF COLLECTIVE ION ACCELERATION EXPERIMENTS
F. Begay, T.A. Fine, H.R. Griem, R.A. Hess, and M.J. Rhee, U. of Maryland, College Park, MD; and
R.F. Schneider, Naval Surface Weapons Center, Silver Spring, MD

2P18 CHARACTERISTICS OF PLASMA PRODUCED BY AN RF INDUCTION DISCHARGE
M.H. Cho, G.H. Kim, N. Hershkowitz, P. Nonn, and J. Dekock, U. of Wisconsin, Madison, WI

2P19 ELECTRON TEMPERATURES OF REB PRODUCED PLASMAS
T.E. Repetti and M.L. Brake, U. of Michigan, Ann Arbor, MI

2P20 DIAGNOSTICS FOR PULSED ION DIODE WITH TUNABLE LASERS
H. Yoneda, H. Tomita, K. Horioka and K. Kasuya, Tokyo Institute of Technology, Yokohama, Japan

2P21 PRODUCTION OF FOCUSED BEAMS WITH PULSED CRYOGENIC-MAGNETICALLY INSULATED DIODES
K. Horioka, T. Saito, Y. Konya, H. Yoneda, K. Kasuya, Tokyo Institute of Technology, Yokohama, Japan;
S. Teii, Musashi Institute of Technology, Japan; and
T. Tazima, Institute of Plasma Physics, Nagoya U., Nagoya, Japan

2P22 ELECTRON COLLECTOR AND EXPLODING FILM ION SOURCE STUDIES WITH AN EXTRACTOR ION DIODE
G.D. Rondeau, J.B. Greenly, D.A. Hammer, and G.J. Bordonaro, Cornell U., Ithaca, NY

2P23 HIGH REPETITION RATE INTENSE ION BEAM DIODE
S.C. Glidden, N. Qi, J.B. Greenly, L. Brissette, and D.A. Hammer, Cornell U., Ithaca, NY

2P24 THEORY OF APPLIED-B ION DIODES
M.P. Desjarlais, Sandia National Labs, Albuquerque, NM

Monday Afternoon, 6 June 1988

2P25 NUMERICAL SIMULATIONS OF APPLIED-B ION DIODES
S.E. Rosenthal, Sandia National Labs, Albuquerque, NM

2P26 A REFLEX GLOW DISCHARGE AS A PLASMA SOURCE FOR BROAD AREA ELECTRON BEAM GENERATION
J.J. Rocca, C. Murray and B. Szapiro, Colorado State U., Fort Collins, CO

2P27 STUDY OF A PLASMA EDGE CATHODE SCHEME FOR ELECTRON BEAM EXTRACTION
M.G. Grothaus, J. Cunningham, and K.W. Zieher, Texas Tech U., Lubbock, TX

2P28 TRANSIENT HEATING METHOD FOR THERMIONIC CATHODES IN REB GENERATORS
W.D. Getty, M.E. Herniter, and G.A. Lipscomb, U. of Michigan, Ann Arbor, MI

Monday Afternoon, 6 June 1988

Poster Session 2P29-34: ION BEAM DIAGNOSTICS

2P29 REFINEMENT OF THE CR-39 RANGE FILTER VOLTAGE DIAGNOSTIC
S.N. Lapin, L.L. Davis, G.W. Cooper, U. of New Mexico, Albuquerque, NM; and
J.E. Bailey, P. Reyes, A.L. Carlson, Sandia National Labs, Albuquerque, NM

2P30 ANGULAR DEPENDENCE OF THE THICK TARGET YIELDS OF THE $D(^7Li,n)^8Be$ and $^7Li(p,\gamma)^8Be$ REACTIONS
C.B. Evans, J. VanDenburg, G.W. Cooper, U. of New Mexico, Albuquerque, NM; and
C.L. Ruiz and R.J. Leeper, Sandia Natl Labs, Albuquerque, NM

2P31 LITHIUM BEAM MEASUREMENTS ON PBFA II
C.L. Ruiz, K.W. Bieg, D.J. Johnson, R.J. Leeper, T.R. Lockner, J. Maenchen, T.A. Mehlhorn, A.L. Pregenzer, W.A. Stygar, J.R. Woodworth, Sandia National Labs, Albuquerque, NM; and
G.W. Cooper, C.B. Evans, U. of New Mexico, Albuquerque, NM

2P32 SIMULATION AND INTERPRETATION OF ION BEAM DIAGNOSTICS ON PBFA II
T.A. Mehlhorn, W.E. Nelson, J.E. Maenchen, W.A. Stygar, C.L. Ruiz, T.R. Lockner, D.J. Johnson, Sandia National Labs, Albuquerque, NM

2P33 INTENSE ION BEAM K-ALPHA MEASUREMENTS ON PBFA II
J.E. Maenchen, D. Wenger, T.A. Mehlhorn, and R.J. Leeper, Sandia National Labs, Albuquerque, NM

2P34 AN ALUMINUM K_α PROTON CURRENT DENSITY COLLECTOR
D.D. Meyerhofer, B.R. Kusse, G. Rondeau, C.K. Struckman, and G. Bordonaro, Cornell U., Ithaca, NY

Monday Afternoon, 6 June 1988

Poster Session 2P35-46: FAST WAVE DEVICES - I; FEL and CARM

2P35 EFFECT OF ELECTRON PREBUNCHING ON THE RADIATION GROWTH RATE IN A COLLECTIVE (RAMAN) FREE ELECTRON LASER AMPLIFIER
C. Leibovitch, K. Xu, and G. Bekefi, Massachusetts Institute of Technology, Cambridge, MA

2P36 WAVE PROFILE MODIFICATION OBSERVED IN A COLLECTIVE (RAMAN) FREE ELECTRON LASER
K. Xu, C. Leibovitch, G. Bekefi, J.S. Wurtele, and J. Fajans, Massachusetts Institute of Technology, Cambridge, MA

2P37 ANALYSIS AND NONLINEAR SIMULATION OF SUB-MILLIMETER FREE ELECTRON LASER AMPLIFIER WITH A HELICAL QUADRUPOLE WIGGLER
J.E. Scharer, S.F. Chang, and O.C. Eldridge, U. of Wisconsin, Madison, WI

2P38 EFFECT OF MODE COMPETITION ON THE EFFICIENCY OF FEL OSCILLATORS IN THE LOW GAIN REGIME
B. Levush, T.M. Antonsen, Jr., and A. Serbeto, U. of Maryland, College Park, MD

2P39 HIGHER HARMONIC GENERATION IN FREE ELECTRON LASERS
S. Riyopoulos and C.M. Tang, Naval Research Lab, Washington, DC

2P40 OPTIMIZED GAUSSIAN EXPANSION METHOD FOR THE EVOLUTION OF FREE ELECTRON LASER (FEL) RADIATION
C.M. Tang and P. Sprangle, Naval Research Lab, Washington, DC; S. Riyopoulos, Science Applications Intl. Corp., McLean, VA; and A. Ting, Berkeley Research Associates, Springfield, VA

2P41 RADIATION OF A FINITE ELECTRON-BEAM PULSE IN A FREE-ELECTRON LASER AMPLIFIER
B. Hafizi, Science Applications Intl. Corp., McLean, VA; A. Ting, Berkeley Research Associates, Springfield, VA; and C.M. Tang and P. Sprangle, Naval Research Lab, Washington, DC

2P42 SHORT-PERIOD-WIGGLER FREE ELECTRON LASERS WITH SHEET ELECTRON BEAMS
J.H. Booske, T.M. Antonsen, Jr., D. Bengtson, W.W. Destler, V.L. Granatstein, P.E. Latham, B. Levush, I.D. Mayergoyz, D.J. Radack, E.T. Rosenbury, U. of Maryland, College Park, MD

2P43 FINITE V EFFECT ON CERENKOV FEL IN A PARTIALLY DIELECTRIC LOADED WAVEGUIDE
G. Mishra and V.K. Tripathi, Indian Institute of Technology, New Delhi, India

2P44 EXPERIMENTS WITH A 35 GHz CYCLOTRON AUTO RESONANCE MASER (CARM)
A.C. DiRienzo, G. Bekefi, and C. Leibovitch, Massachusetts Institute of Technology, Cambridge, MA

2P45 COHERENTLY GYROPHASED CARM
T.H. Kho and A.T. Lin, U. of California, Los Angeles, CA; and L. Chen, Plasma Physics Laboratory, Princeton, NJ

2P46 SLOW WAVE CYCLOTRON MASER
T.H. Kho, and A.T. Lin, U. of California, Los Angeles, CA

Poster Session 2P47-52: ULTRAFAST Z-PINCHES

2P47 EVOLUTION OF A Z-PINCH WITH CONSTANT DI/DT
A.E. Robson, Naval Research Laboratory, Washington, DC

2P48 THE LOS ALAMOS DEUTERIUM FIBER HIGH DENSITY Z-PINCH EXPERIMENT
D.W. Scudder, J.E. Hammel, J.S. Shlachter, Los Alamos Natl Lab, Los Alamos, NM; and R. Lovberg, U. of California, San Diego, CA

2P49 TWO-DIMENSIONAL MODELING OF THE SOLID DEUTERIUM FIBER Z-PINCH
I.R. Lindemuth and R.A. Nebel, Los Alamos Natl Lab, Los Alamos, NM

2P50 LOW-Z GAS PUFF IMPLOSIONS
W.W. Hsing, J.L. Porter, and R.B. Spielman, Sandia National Labs, Albuquerque, NM

2P51 TIME AND SPACE RESOLVED MEASUREMENTS OF X-RAY EMISSION FROM A PLASMA IMPLOSION
J.L. Porter, B.A. Hammel, J.S. McGurn, and L.E. Ruggles, Sandia National Lab, Albuquerque, NM

2P52 TEMPORAL EVOLUTION OF HOT SPOTS AND HIGH TEMPERATURE PLASMAS IN A SMALL GAS-PUFF Z-PINCH
C. Deeney, U. Stuttgart, Stuttgart, FRG; and P. Choi, Blackett Labs, Imperial College, London, UK

Monday Afternoon, 6 June 1988

Poster Session 2P53-56: X-RAY LASERS - I

2P53 CHARACTERIZATION OF CARBON Z-PINCH IMPLOSIONS FOR A RECOMBINATION X-RAY LASER IN H-LIKE C IONS
N. Qi, G.D. Rondeau, D.A. Hammer, and G.J. Bordonaro, Cornell U., Ithaca, NY

2P54 TEMPERATURE AND DENSITY ANALYSIS OF NARYA CONVERTER LAYER TARGETS
R.J. Dukart, B.A. Hammel, T.W. Hussey and R.B. Spielman, Sandia National Labs, Albuquerque, NM

2P55 EFFECT OF Z-PINCH IMPLOSION UNCERTAINTIES ON PULSE-POWER-DRIVEN, PHOTOIONIZATION-PUMPED, SOFT X-RAY LASERS
T.W. Hussey and M.K. Matzen, Sandia Natl Labs, Albuquerque, NM; N.F. Roderick, U. of New Mexico, Albuquerque, NM

2P56 X AND UV TIME RESOLVING DIAGNOSTICS FOR X-RAY LASER EXPERIMENTS
D. Naccach, J-L. Bourgade, P. Combis, Centre d'Etudes de Limeil-Valenton, France; and C. Keane, B. MacGowan, D. Matthews, Lawrence Livermore Natl Lab, Livermore, CA

Tuesday Morning, 7 June 1988
8:30 AM - Grand Ballroom C

REVIEW 3R

FAST-OPENING VACUUM SWITCHES FOR HIGH-POWER INDUCTIVE ENERGY STORAGE

G. Cooperstein
Naval Research Laboratory, Washington, DC

Chairperson: P.F. Ottinger

Tuesday Morning, 7 June 1988
9:40 AM - Cedar

Oral Session 3A: COMPACT TOROIDS - I; Spheromaks and FRCs
Chairperson: D.J. Rej

3A1 ELECTRIC FIELDS IN DECAYING CTX SPHEROMAKS IN THE 0.67 m RADIUS MESH FLUX CONSERVER
J.C. Fernandez, T.R. Jarboe, and C.W. Barnes, Los Alamos National Labs, Los Alamos, NM

3A2 OBSERVATION OF A PRESSURE DRIVEN INSTABILITY IN THE CTX SPHEROMAK
F.J. Wysocki, J.C. Fernandez, I. Henins, and T.R. Jarboe, Los Alamos National Lab, Los Alamos, NM

3A3 MAGNETIC FORCE-FREE CONFIGURATIONS
N.A. Salingaros, U. of Texas, San Antonio, TX

3A4 INTERNAL DISRUPTIONS IN THE S-1 SPHEROMAK DISCHARGES
T.K. Chu, R.A. Ellis, Jr., A.C. Janos, F.M. Levinton, R.M. Mayo, R.W. Motley, Y. Ono, Y. Ueda, and M. Yamada

3A5 REFLECTION OF ACCELERATED PLASMA RINGS FROM CONICAL ELECTRODES IN THE RACE EXPERIMENT
C.W. Hartman, J.H. Hammer, J.L. Eddleman, and H.S. McLean, Lawrence Livermore National Lab, Livermore, CA

3A6 COMPUTER SIMULATIONS OF COMPACT TOROID FORMATION AND ACCELERATION
R.E. Peterkin, Jr., J. Buff, M.H. Frese, N.F. Roderick, Mission Research Corp., Albuquerque, NM; and C.J. Clouse, D. Dietz, K.E. Hackett, J.E. Rowley, C.R. Sovinec, AFWL Kirtland AFB, Albuquerque, NM

3A7-8 Invited Paper
A REVIEW OF 10 YEARS OF SPHEROMAK RESEARCH
C.W. Barnes, Los Alamos National Lab, Los Alamos, NM

3A9 DESIGN VERIFICATION OF THE IGNITRON-SWITCHED ENERGY STORAGE MODULES FOR THE LSX FRC DEVICE
K.F. McDonald, M.A. Mayerchak, T.E. DeHart, P.F. Hedeen, W.S. Kimball, and A.L. Hoffman, Spectra Technology, Inc., Bellevue, WA

3A10 DESIGN AND DESIGN VERIFICATION OF THE PLASMA VESSEL FOR THE LSX FRC EXPERIMENT
E.A. Crawford, L.M. Carey, T.H. DeHart, D.G. Harding, A.L. Hoffman, W.S. Roberts, J.T. Slough and L.C. Steinhauer, Spectra Technology, Inc., Bellevue, WA

Tuesday Morning, 7 June 1988
9:40 AM - Aspen

Oral Session 3B: SPACE PLASMAS - II

Chairperson: A.L. Peratt

-2 Invited Paper
PECULIAR PHENOMENA IN THE PARALLEL PROPAGATION OF HIGH-BETA PLASMA BEAMS
L.R.O. Storey, NASA Headquarters, Washington, DC

DYNAMICS OF SUBSTORM BREAKUP
L.P. Block and C.G. Falthammar, Royal Institute of Technology, Stockholm, Sweden;
P.L. Rothwell, Hanscom AFB, Bedford, MA; and
M.B. Silevitch, Northeastern U., Boston, MA

4 REDSHIFT OF SPECTRAL LINES IN THE SUN'S CHROMOSPHERE
P. Marmet, Herzberg Institute of Astrophysics, Ottawa, Ontario, Canada

5 AN OVERVIEW OF ATOMIC AND MOLECULAR PROCESSES IN CRITICAL VELOCITY IONIZATION
S.T. Lai and E. Murad, Hanscom AFB, MA; and
W.J. McNeil, Radex, Inc., Bedford, MA

16 MAGNETIC VORTEX TUBES IN LABORATORY AND ASTROPHYSICAL PLASMAS
P.F. Brown, U. of Manchester Institute of Science and Technology, Manchester, UK

37 STABILITY OF FORCE-FREE MAGNETIC CONFIGURATIONS AND THE PROBLEM OF SOLAR CORONAL HEATING
G.E. Vekstein, Institute of Nuclear Physics, Novosibirsk, USSR

Tuesday Morning, 7 June 1988
9:40 AM - East Ballroom-A

Oral Session 3C: FAST WAVE DEVICES - II

Chairperson: R.K. Parker

3C1-2 Invited Paper
RECENT ADVANCES IN HIGH FREQUENCY GYROTRON OSCILLATORS
K.E. Kreischer, S.E. Spira, R.J. Temkin, and C.Y. Wang, Massachusetts Institute of Technology, Cambridge, MA

3C3 MAGNETIC OUTPUT CONTROL AND EXTERNAL FREQUENCY CONTROL OF THE ORBITRON MASER
I. Alexeff, F. Dyer, and M. Rader, U. of Tennessee, Knoxville, TN

3C4 RADIATION MEASUREMENTS IN A SUBMILLIMETER WAVELENGTH FREE ELECTRON LASER
D.A. Kirkpatrick, G. Bekefi, and A.C. DiRienzo, Massachusetts Institute of Technology, Cambridge, MA;
H.P. Freund and A.K. Ganguly, Naval Research Laboratory, Washington, DC

3C5 THE PLANAR OROTRON AND THE PLANAR-GRATING KLYSTRON
J. Walsh, E. Marshall, J. Jackson, Y. Xu, and T. Budka, Dartmouth College, Hanover, NH

3C6 ONSET OF AN ABSOLUTE INSTABILITY IN THE GYROPENIOTRON AMPLIFIER
S. Ahn, A.K. Ganguly and S.Y. Park, Naval Research Laboratory, Washington, DC

3C7 DESIGN OF A HARMONIC UBITRON AMPLIFIER EXPERIMENT
H. Bluem, R.H. Jackson, H.P. Freund, and D.E. Pershing, Naval Research Laboratory, Washington, DC; and
J.H. Booske and V.L. Granatstein, U. Maryland, College Park, MD

3C8 THRESHOLD CURRENT BEHAVIOR OF THE NEGATIVE MASS INSTABILITY WITH AN AXIS-ENCIRCLING ELECTRON BEAM
J. Choe, V. Ayres, W. Namkung, and K. Boulais, Naval Research Warfare Center, Silver Spring, MD; and
S. Ahn and A. Ganguly, Naval Research Lab, Washington, DC

Tuesday Morning, 7 June 1988
9:40 AM - East Ballroom-B

Oral Session 3D: FAST OPENING SWITCHES - I

Chairperson: R.J. Commisso

3D1-2 Invited Paper
GENERATION OF HIGH VOLTAGES IN PLASMA FLOW SWITCH EXPERIMENTS AT TEN MEGAMPERES
M.L. Alme, G. Bird, C. Boyer, S.K. Coffey, D. Conte, J.F. Davis, S.W. Seiler, P.J. Turchi, R&D Associates, Alexandria, VA;
W.L. Baker, J.H. Degnan, D.J. Hall, J.L. Holmes, J.B. Kriebel, W.F. McCullough, D.W. Price, AFWL, Kirtland AFB, NM; J. Buff, M.H. Frese, R.E. Peterkin, N.F. Roderick, Mission Research Corp.; J.D. Graham, E.A. Lopez, Maxwell Laboratories, Albuquerque, NM

3D3 TEST OF A PBFA-II PLASMA OPENING SWITCH (POS) ON BLACKJACK 5
T.J. Renk, G.E. Rochau, C.W. Mendel, Jr., D.H. McDaniel, W.B.S. Moore, D.M. Zager, G.R. Mowrer, W.W. Simpson, F.A. Bouchier, G.E. Laderach, Sandia National Lab, Albuquerque, NM; B. Rollins, C. McDougal, T. Grasser, G. Devlin, R. Johnson T. Broyles, KTECH, Albuquerque, NM; W. Rix and J. Rauch, Maxwell Labs, San Diego, CA

3D4 TWO-DIMENSIONAL MAGNETOHYDRODYNAMIC SIMULATIONS OF THE PBFA-II PLASMA EROSION OPENING SWITCH
M.H. Frese, Mission Research Corporation, Albuquerque, NM

3D5 SIMULATION OF PLASMA EROSION OPENING SWITCHES
R.J. Mason and M.E. Jones, Los Alamos Natl Lab, Los Alamos, NM

3D6 OPERATION AND EMPIRICAL MODELING OF THE PLASMA EROSION SWITCH
W. Rix, J. Thompson, J. Shannon, P. Davis, and K. Ware, Maxwell Laboratories, Inc., San Diego, CA

3D7 ION EMISSION FROM PEOS PLASMAS
B.V. Weber, P.J. Goodrich, D.D. Hinshelwood, JAYCOR, Vienna, VA;
R.J. Commisso, W.F. Oliphant, P.F. Ottinger, and F.C. Young, Naval Research Laboratory, Washington, DC;

3D8 PERFORMANCE OF A 1-μs, 1-MA PLASMA EROSION OPENING SWITCH WHEN COUPLED TO AN E-BEAM DIODE
R.J. Commisso, J.R. Boller, J.C. Kellogg, D. Mosher, and P.F. Ottinger, Naval Research Laboratory, Washington, DC;
D.D. Hinshelwood and B.V. Weber, JAYCOR, Vienna, VA

3D9-10 Invited Paper
TERAWATT PULSED POWER GENERATOR WITH PLASMA OPENING SWITCH
S.P. Bugaev, A.M. Volkov, A.M. Iskoldsky, A.A. Kim, B.M. Kovalchuk, V.A. Kokshenev, G.A. Mesyats, A.A. Novikov, V.P. Yakovlev, High Current Electronics Institute of the USSR, Academy of Sciences, Tomsk, USSR

Tuesday Morning, 7 June 1988

Poster Session 3P1-4: GASEOUS ELECTRONICS AND ARC TECHNOLOGY - II

3P1 ROTATING SPEED OF SF_6 ARC DRIVEN BY A RADIAL MAGNETIC FIELD
S. Hamano, H. Sasao, and Y. Wada, Mitsubishi Electric Co., Amagasaki, Japan

3P2 DIFFUSE DISCHARGE INTERRUPTION INDUCED BY AN ArF LASER
T. Sasagawa, A. Kawahara, and M. Obara, Keio U., Yokohama, Japan

3P3 A SYSTEM FOR MEASURING THE TIMING OF HIGH-CURRENT SPARK GAP SWITCHES IN A PULSED HIGH VOLTAGE FUSION EXPERIMENT
R.E. Fowles and N.G. Ward, U. of Washington, Seattle, WA

3P4 LASER-TRIGGERED HIGH-VOLTAGE VACUUM SWITCH
P.J. Brannon and M.E. Riley, Sandia Natl Lab, Albuquerque, NM

Poster Session 3P5-10: PLASMA CHEMISTRY

3P5 ELECTRON DYNAMICS OF RF DRIVEN PARALLEL PLANE REACTOR
W.S. Lawson, M.A. Lieberman, and C.K. Birdsall, U. of California, Berkeley, CA

3P6 EVALUATION OF CF_4 CONICAL THETA PINCH PLASMA FOR PULSED ETCHING OF MICROELECTRONIC MATERIALS
P.D. Pedrow and A.M. Nasiruddin, Washington State U., Pullman, WA;
J. Grandy and R.J. Kearney, U. of Idaho

3P7 MICROWAVE DISCHARGE EXCITATION OF XEO
M.L. Passow and M.L. Brake, U. of Michigan, Ann Arbor, MI

3P8 A TECHNIQUE FOR CONTROLLING THE SIDEWALL ANGLE OF A TRENCH ETCH IN SILICON
R.N. Carlile, U. of Arizona, Tucson, AZ; V.C. Liang, LSI Technology, Inc., San Jose, CA; and M.M. Smadi, IBM, Hopewell Junction, NY

3P9 A PLASMA SOURCE FOR FOURIER TRANSFORM MASS SPECTROMETRY
J.L. Shohet, U. of Wisconsin, Madison, WI; and
J.T. Brenna, IBM Corporation

3P10 RF DISCHARGE EXPERIMENT FOR MODIFICATIONS OF ORGANIC MOLECULES
M. Ampela, D. Smith, K.A. Connor, Rensselaer Polytechnic Institute, Troy, NY; and
J.T. Woo, Interscience, Inc., Troy, NY

Tuesday Morning, 7 June 1988

Poster Session 3P11-19: MICROWAVE-PLASMA INTERACTIONS - II

3P11 THE PLASMA ELECTRON MICROWAVE SOURCE (PEMS) CONCEPT: A NOVEL APPROACH TO GENERATING INTENSE PULSES OF MICROWAVE POWER
G.E. Guest and R.A. Dandl, Applied Microwave Plasma Concepts, Inc., Carlsbad, CA

3P12 PROPAGATION AND BREAKDOWN IN GASES BY SHORT BURST, HIGH-POWER MICROWAVES
H.L. Rappaport, P.E. Latham, and C.D. Striffler, U. of Maryland, College Park, MD

3P13 A RELATIVISTIC FLUID CODE FOR HIGH-POWER MICROWAVE PROPAGATION
G. Graham, EG&G Energy Measurements, Los Alamos, NM; and
R. Roussel-Dupre, Los Alamos National Lab, Los Alamos, NM

3P14 CROSSED-MICROWAVE-BEAM AIR IONIZATION LABORATORY EXPERIMENTS
W.T. Armstrong, R. Karl, R. Roussel-Dupre, Los Alamos National Lab, Los Alamos, NM;
R. Alvarez, P. Bolton, G. Sieger, Lawrence Livermore National Lab, Livermore, CA;
L. Testermann, T. Tunnell, EG&G Energy Measurements, Los Alamos, NM; and
D. Ekstrom, K. Stalder, SRI International, Menlo Park, CA

3P15 FLUID SIMULATIONS OF AIR BREAKDOWN EXPERIMENTS
R. Roussel-Dupre and W.T. Armstrong, Los Alamos National Lab, Los Alamos, NM

3P16 ELECTRON DENSITY AND COLLISION FREQUENCY MEASUREMENTS IN A PULSED, HIGH POWER MICROWAVE DISCHARGE IN LOW PRESSURE AIR
K.R. Stalder and D.J. Ekstrom, SRI International, Menlo Park, CA

3P17 TEMPORAL OBSERVATIONS OF MICROWAVE GENERATED AIR PLASMA WITH A STREAK CAMERA IN THE VISIBLE WAVELENGTH REGION
P.R. Bolton, R.A. Alvarez, and G.E. Seiger, Lawrence Livermore National Lab, Livermore, CA

3P18 OPTICAL EMISSION MEASUREMENTS IN A PULSED, HIGH POWER MICROWAVE DISCHARGE IN LOW PRESSURE AIR
D.J. Eckstrom, STI International, Menlo Park, CA

3P19 MULTIPLY-CHARGED ION AND X-RAY PRODUCTION BY AN ECRH PLASMA
W.D. Getty, T.P. Goodman and D.R. Whaley, U. of Michigan, Ann Arbor, MI; and
J.H. Booske, U. of Maryland, College Park, MD

Tuesday Morning, 7 June 1988

Poster Session 3P20-26: PLASMA DIAGNOSTICS -

3P20 MODELING OF HEAVY ION BEAM PROBES FOR ADVANCED FUSION EXPERIMENTS
V. Simcic, J. Resnick, T.P. Crowley and K.A. Connor, Rensselaer Polytechnic Institute, Troy, NY

3P21 ADVANCED MEASUREMENT CONCEPTS FOR HEAVY ION BEAM PROBES
J. Heard, V. Simcic, N. Li, T.P. Crowley, K.A. Connor, S. Khan, P. Schoch, J. Forster, R.L. Hickok, and W.C. Jennings, Rensselaer Polytechnic Institute, Troy, NY

3P22 COMPONENT DEVELOPMENT FOR HEAVY ION BEAM PROBES
S. Aceto, J. Resnick, J. Lewis, J. Schatz, P. Schoch, A. Carnevali, K.A. Connor, T.P. Crowley, R.L. Hickok, V. Simcic, S. Erich, T. Cooley, P. Czora, Rensselaer Polytechnic Institute, Troy, NY

3P23 CONCEPTUAL DESIGN OF A FUSION GAMMA RAY EXPERIMENT FOR TFTR
C.L. Fiore, R.D. Petrasso, C-K. Li, Massachusetts Institute of Technology, Cambridge, MA

3P24 SINGLE-SHOT MICROWAVE SPECTRAL DIAGNOSTIC TECHNIQUES
L.M. Miner, Kirtland AFB, NM; and
D.E. Voss and C.D. Cremer, Science and Engineering Assoc., Inc., Albuquerque, NM

3P25 LASER-INDUCED FLUORESCENCE MEASUREMENTS OF ION DISTRIBUTION FUNCTION IN A MULTIPOLE DISCHARGE
J. Goree and M. Goeckner, U. of Iowa, Iowa City, IA

3P26 HOT ELECTRON EFFECT ON LINE-RATIO TEMPERATURE MEASUREMENTS IN LASER PLASMAS
J.N. Olsen, Sandia National Laboratory, Albuquerque, NM

Tuesday Afternoon, 7 June 1988
2:00 PM - West Ballroom

PLASMA SCIENCE HISTORY 4H

PULSED POWER TECHNOLOGY - HISTORY, STATUS, AND PROSPECTS

A.C. Kolb
Maxwell Laboratories, San Diego, CA

Chairperson: J. Benford

Tuesday Afternoon, 7 June 1988
2:50 PM - Cedar

Oral Session 4A: COMPACT TOROIDS - II; FRCs

Chairperson: W.F. Dove

4A1 ZERO-DIMENSIONAL POWER BALANCE MODELING OF FRCs FORMED IN FRX-C/LSM
R.E. Chrien, Los Alamos National Lab, Los Alamos, NM

4A2 EXPERIMENTALLY DETERMINED FRC EQUILIBRIA USING VISIBLE CONTINUUM LIGHT
J.T. Slough, Spectra Technology, Inc., Bellevue, WA

4A3-4 Invited Paper
REVIEW OF FIELD-REVERSED CONFIGURATION STABILITY
D.C. Barnes, Science Applications Intl Corp., Austin, TX

4A5 A POSSIBLE EXPERIMENTAL STABILITY STUDY OF FIELD REVERSED CONFIGURATIONS WITH NEUTRAL BEAM INJECTION
M. Tuszewski, Los Alamos Natl Lab, Los Alamos, NM;
H. Momota, IPP, Nagoya U., Nagoya, Japan

4A6 EXTENSION OF THE COAXIAL SLOW SOURCE TO SLOWER RISE TIMES
G.C. Vlases, Z.A. Pietrzyk, R. Smith and R. Raman, U. of Washington, Seattle, WA

4A7 FORMATION AND DECAY OF A HIGH-BETA PLASMA EQUILIBRIUM DRIVEN BY ROTATING MAGNETIC FIELDS
A. Kuthi, H. Zwi, A.Y. Wong, U. of California, Los Angeles, CA

4A8 ENGINEERING DESIGN OF THE HIGH-POWER FRC COMPRESSION HEATING EXPERIMENT FOR FRX-C
D.J. Rej and J.E. Hinckley, Los Alamos Natl Lab, Los Alamos, NM

4A9 2D MHD SIMULATION OF THE LOS ALAMOS FRC COMPRESSION EXPERIMENT
A.H. Glasser, Los Alamos National Lab, Los Alamos, NM

Tuesday Afternoon, 7 June 1988
2:50 PM - Aspen

Oral Session 4B: GASEOUS ELECTRONICS AND ARC TECHNOLOGY - III; Breakdown Mechanisms & Gas Discharge Modeling

Chairperson: K.H. Schoenbach

4B1-2 Invited Paper
THE PHYSICS OF TRIGGERED BREAKDOWN
P.F. Williams and F.E. Peterkin, U. of Nebraska, Lincoln, NE

4B3 PREDICTION OF PICOSECOND VOLTAGE COLLAPSE AND ELECTROMAGNETIC WAVE GENERATION IN GAS AVALANCHE SWITCHES
D.J. Mayhall, J.H. Yee and M. Duong-Van, Lawrence Livermore Natl Lab, Livermore, CA; and
F. Villa, Stanford Linear Accelerator Center, Stanford, CA

4B4 NUMERICAL ANALYSIS OF PULSED DISCHARGES IN NITROGEN
S.K. Dhali and L.H. Low, Southern Illinois U., Carbondale, IL

4B5 MECHANISMS LEADING TO FLASHOVER OF DIELECTRIC SURFACES IN UV ILLUMINATED ENVIRONMENTS
T.L. Peck and M.J. Kushner, U. of Illinois, Urbana, IL

4B6 A LUMPED CIRCUIT MODEL FOR TRANSIENT ARC DISCHARGES
R.T. Robiscoe, Montana State U., Bozeman, MT; and
A. Kadish and W.B. Maier II, Los Alamos Natl Lab, Los Alamos, NM

4B7 DIFFUSE DISCHARGE INTERRUPTION INDUCED BY ArF/KrF LASERS IN PURE N_2 GAS
T. Sasagawa, A. Kawahara, and M. Obara, Keio U., Yokohama, Japan

4B8 A COMPARISON OF ELECTRON BEAM AND HEAVY ION EXCITATION OF RATE GAS-HALOGEN GAS MIXTURES
T.J. Moratz and M.J. Kushner, U. of Illinois, Urbana, IL

4B9 A REVIEW OF THE MODELING OF LOW PRESSURE DISCHARGES FOR PLASMA CHEMISTRY AND PLASMA PROCESSING
M.J. Kushner, U. of Illinois, Urbana, IL; and
L.E. Kline, Westinghouse R&D Center, Pittsburgh, PA

Tuesday Afternoon, 7 June 1988
2:50 PM - East Ballroom-A

Oral Session 4C: PLASMA WAVES AND INSTABILITIES - I

Chairperson: A. Hirose

4C1-2 Invited Paper
OBSERVATION OF A HIGH-FREQUENCY SHEATH-PLASMA INSTABILITY
R.L. Stenzel, U. of California, Los Angeles, CA

4C3 MEASUREMENT OF HIGH FREQUENCY THERMAL FLUCTUATIONS WITH ANTENNAS IN PLASMAS
J.L. Ferreira and R.L. Stenzel, U. of California, Los Angeles, CA

4C4 COMPRESSIONAL ALFVEN WAVES IN A B FIELD GRADIENT
T. Intrator, S. Meassick and N. Hershkowitz, U. of Wisconsin, Madison, WI

4C5 RF FIELD MEASUREMENTS IN THE VICINITY OF AN ICRF ANTENNA
R. Majeski, T. Intrator, D. Roberts, N. Hershkowitz, J. Tataronis, U. of Wisconsin, Madison, WI; and
W. Grossmann, Science Applications Intl Corp., New York, NY

4C6 STOCHASTIC DIFFUSION IN THE ABSENCE OF RESONANCES
O. Ishihara, W. Ho, and K.M. Yuen, Texas Tech U., Lubbock, TX;
A. Hirose, U. of Saskatchewan, Saskatoon, Saskatchewan, Canada;

4C7 RESISTIVE MHD BALLOONING MODE IN TOKAMAKS
A. Hirose, U. of Saskatchewan, Saskatoon, Saskatchewan, Canada;
O. Ishihara, Texas Tech U., Lubbock, TX

Tuesday Afternoon, 7 June 1988
2:50 PM - East Ballroom-B

Oral Session 4D: INTENSE ELECTRON BEAMS

Chairperson: J. Maenchen

4D1 IMAGE CHARGE FOCUSING OF INTENSE ELECTRON BEAMS
S. Humphries, Jr., U. of New Mexico, Albuquerque, NM; and
C. Ekdahl, Los Alamos National Lab, Los Alamos, NM

4D2 CONTROL OF FLASH X-RAY ENVIRONMENT USING A B_θ-LENS DIODE
T.W.L. Sanford, J.A. Halbleib, J.W. Poukey, C.E. Heath,
R. Mock, Sandia National Labs, Albuquerque, NM; and
V.L. Bailey, G.A. Proulx, P.W. Spence, and H. Kishi,
Pulse Sciences, Inc., San Leandro CA

4D3 INVESTIGATION OF AN ELECTRON BEAM AT LONG PULSE WIDTHS FOR PUMPING LASERS
M.A. Sweeney, E.L. Patterson, and G.E. Samlin, Sandia National Labs, Albuquerque, NM

4D4 LINEAR STABILITY OF RADIAL MODES OF SPHERICALLY COUNTERSTREAMING BEAMS
G. Gnavi, U. of Buenos Aires, Buenos Aires, Argentina

4D5 SIGNAL AMPLIFICATION AND PIERCE'S INSTABILITY IN CONVERGENT PARTICLE BEAMS
G. Gnavi and F.T. Gratton, U. of Buenos Aires, Buenos Aires, Argentina

4D6 AMPLIFICATION OF RELATIVISTIC ELECTRON BEAM CURRENT PROPAGATING IN AMBIENT NEUTRAL GASES
G.P. Gupta and V.K. Rohatgi, Bhabha Atomic Research Centre, Bombay, India

4D7 EXPLOSIVE-GENERATOR-POWERED VACUUM-POWER-FLOW EXPERIMENT
B.L. Freeman, W. Armstrong, J.H. Brownell, M.C. Clark,
H.A. Davis, D.G. Rickel, M.G. Sheppard, J.L. Stokes, and
J.W. Toevs, Los Alamos National Lab, Los Alamos, NM

Tuesday Afternoon, 7 June 1988

Poster Session 4P27-34: INTENSE MICROWAVE SOURCES - I

4P27 POWER FLOW AND MICROWAVE GENERATION IN MAGNETICALLY INSULATED TRANSMISSION LINE OSCILLATORS
A.L. Peratt and M.G. Sheppard, Los Alamos National Lab, Los Alamos, NM

4P28 MILO EXPERIMENTS WITH VARIABLE TERMINATION
R.D. Fulton, H.A. Davis, D.G. Rickel, and M.G. Sheppard, Los Alamos National Lab, Los Alamos, NM

4P29 LONG-PULSE VIRTUAL CATHODE OSCILLATOR EXPERIMENTS
P.D. Coleman and J.F. Aurand, Sandia National Laboratories, Albuquerque, NM

4P30 LOW VOLTAGE RELATIVISTIC MAGNETRON EXPERIMENT
T.A. Treado and W.O. Doggett, North Carolina State U., Raleigh, NC

4P31 EXPERIMENTAL RESULTS ON A PROTOTYPE LONG PULSE HIGH POWER MICROWAVE TRANSMITTER
R.S. Smith III, D.J. Jenkins, N.G. Woodard, G.E. Thomas, Varian Associates, Inc., Beverly, MA; and
T.A. Treado, W.O. Doggett, North Carolina State U., Raleigh, NC

4P32 THEORY OF THE HIGH-POWER MAGNETRON WITH INTENSE ELECTRON FLOW
R. Stark and H. Uhm, Naval Surface Warfare Center, Silver Spring, MD

4P33 NONLINEAR PERIODIC SURFACE WAVES ON THE BRILLOUIN SHEATH
J.A. Robertson, Varian Associates, Inc., Beverly, MA

4P34 EXPERIMENTAL HIGH POWER PLASMA-FILLED BACKWARD WAVE OSCILLATOR RESULTS
K. Minami, W.R. Lou, W.W. Destler, R.A. Kehs, V.L. Granatstein, and Y. Carmel, U. of Maryland, College Park, MD

Tuesday Afternoon, 7 June 1988

Poster Session 4P35-45: FAST WAVE DEVICES-III; Gyrotron and Cusptron

4P35 OPERATION OF A PREBUNCHED HIGH HARMONIC GYROTRON
C.S. Kou, K.J. Knudsen, D.B. McDermott, and N.C. Luhmann, Jr.
U. of California, Los Angeles, CA

4P36 INITIAL OPERATION OF A CHERENKOV CYCLOTRON AUTORESONANCE MASER
H. Cao, D.B. McDermott, and N.C. Luhmann, Jr., U. of California, Los Angeles, CA

4P37 85 GHz $TE_{1,1}$ PHASE-LOCKED GYROKLYSTRON OSCILLATOR EXPERIMENT
J.M. Burke, BURKE Technologies, Inc., San Diego, CA;
M.A. Czarnaski and R.P. Fischer, JAYCOR, Inc., Vienna, VA;
A.K. Ganguly, A.W. Fliflet, and W.M. Manheimer, Naval Research Laboratory, Washington, DC; and
L.R. Barnett, U. of Utah, Salt Lake City, UT

4P38 DESIGN OF A 10 MW, 35 GHz PHASE-LOCKED GYROTRON OSCILLATOR DRIVEN BY A PULSELINE ACCELERATOR
S.H. Gold and A.W. Fliflet, Naval Research Lab, Washington, DC

4P39 CYCLOTRON MASER DRIVEN BY A HIGH CURRENT, 0.4 MICROSECOND ELECTRON BEAM GENERATOR
R.M. Gilgenbach, J.G. Wang, R.A. Bosch, and J.J. Choi,
U. of Michigan, Ann Arbor, MI

4P40 LINEAR MODE COMPETITION STUDIES IN MULTI-CAVITY GYROKLYSTRON AMPLIFIERS
P.E. Latham and H. Heikkinen, U. of Maryland, College Park, MD

4P41 LINEAR AND NONLINEAR DESIGN STUDY OF THE CUSPTRON AMPLIFIER
V. Ayres, J. Choe, W. Namkung, K. Boulais, and H. Uhm, Naval Surface Warfare Center, Silver Spring, MD

4P42 EXPERIMENTAL STUDY OF CUSPTRON AMPLIFIERS
K. Boulais, W. Namkung, J. Choe, V. Ayres, and H. Uhm, Naval Surface Warfare Center, Silver Spring, MD

4P43 ELECTRON BEAM DYNAMICS IN CUSPED MAGNETIC FIELDS
K. Boulais, W. Namkung, J. Choe, V. Ayres, and H. Uhm, Naval Surface Warfare Center, Silver Spring, MD

4P44 AN EXPERIMENTAL EIGHTH HARMONIC CUSPTRON DEVICE
K.K. Tiong, S.P. Kuo, P.E. Miller, Polytechnic U., Farmingdale, NY; and
W. Namkung, Naval Surface Weapons Center, Silver Spring, MD

4P45 CHARACTERISTICS AND OPTIMUM OPERATING PARAMETERS OF THE CUSPTRON OSCILLATORS
S.P. Kuo, K.K. Tiong, P.E. Miller, and Q.H. Ji, Polytechnic U., Farmingdale, NY

Tuesday Afternoon, 7 June 1988

Poster Session 4P46-51: SPACE PLASMAS - III

4P46 STAIRSTEP DOUBLE LAYERS
N. Hershkowitz and C.E. Forest, U. of Wisconsin, Madison, WI;
A. Bailey III, California Institute of Technology, Pasadena, CA

4P47 A PARTICLE SIMULATION OF THE TEARING MODE INSTABILITY AT THE DAYSIDE MAGNETOPAUSE
C.W. Allen and D.W. Swift, U. of Alaska, Fairbanks, AK

4P48 WAVE PROPAGATION EFFECTS ON BROADBAND ELECTROSTATIC ION BEAM INSTABILITIES IN THE MAGNETOTAIL
C. Grabbe, U. of Iowa, Iowa City, IA

4P49 COSMIC MICROWAVE BACKGROUND DISTORTIONS AT HIGH FREQUENCIES
W. Peter and A.L. Peratt, Los Alamos Natl Lab, Los Alamos, NM

4P50 GENERATION AND EXCITATION OF ELECTROSTATIC WAVE AROUND LOWER HYBRID RESONANCE FREQUENCY IN THE PRESENCE OF STREAMING ION-BEAM
K.D. Misra, S.P. Mishra and R.P. Pandey, Banaras Hindu U., Varanasi, India

4P51 ELECTROSTATIC DRIFT WAVE IN THE PRESENCE OF INHOMOGENEOUS MAGNETIC FIELD
K.D. Misra, Banaras Hindu U., Varanasi, India

Tuesday Afternoon, 7 June 1988

Poster Session 4P52: POST DEADLINE

4P52 ANOMALOUS DIFFUSION OF A TRANSVERSE MAGNETIC FIELD INTO A HIGH BETA NEUTRALIZED ION BEAM
J. Song, F.J. Wessel, A. Fisher, and N. Rostoker, U. of California, Irvine, CA

Wednesday Morning, 8 June 1988
8:30 AM - Grand Ballroom C

REVIEW 5R

THE HIGH DENSITY Z-PINCH

M.G. Haines
Blackett Laboratory, Imperial College, London, United Kingdom

Chairperson: D.W. Scudder

Wednesday Morning, 8 June 1988
9:40 AM - Cedar

Oral Session 5A: X-RAY LASERS - II

Chairperson: M.K. Matzen

5A1-2 Invited Paper
SOFT X-RAY LASER OPTICS
R.A. London, N.M. Ceglio and D.P. Gaines, Lawrence Livermore National Lab, Livermore, CA

5A3 X-RAY LASER GAIN OPTIMIZATION STUDIES AS FUNCTION OF Z AND PUMP LASER WAVELENGTH
C. Keane, R. London, B. MacGowan, D. Matthews, and M. Rosen, Lawrence Livermore National Lab, Livermore, CA; and
M. Louis-Jacquet, J.L. Bourgade, S. Jacquemot, and D. Naccache, Centre d'Etudes de Limeil-Valenton, France

5A4-5 Invited Paper
X-RAY LASER BY RECOMBINATION IN Li-LIKE IONS: RECENT EXPERIMENTAL RESULTS AND PROSPECTS
G. Jamelot, P. Jaegle, A. Carillon, A. Klisnick, B. Gauthe, and F. Gadi, Laboratoire de Spectroscopie Atomique et Ionique (CNRS), U. of Paris-Sud, Paris, France

5A6 FAST CAPILLARY DISCHARGES AS A SOFT X-RAY AND XUV LASER MEDIA
J.J. Rocca, M.C. Marconi, D. Beethe and M. Villagran, Colorado State U., Fort Collins, CO

5A7 PULSED POWER DRIVEN X-RAY LASER RESEARCH AT PHYSICS INTERNATIONAL COMPANY
T. Nash, P.D. LePell, and M. Krishnan, Physics International Co., San Leandro, CA

5A8 RESONANT PHOTOPUMPING OF A NEON LASANT PLASMA BY A SODIUM PUMP PLASMA
F.C. Young, J.P. Apruzese, P.G. Burkhalter, G. Cooperstein, J. Davis, D. Mosher, P.F. Ottinger, V.E. Scherrer, and S.J. Stephanakis, Naval Research Lab, Washington, DC;
C. Mehlman, Sachs-Freeman Associates, Inc., Landover, MD; and
B.L. Welch, U. of Maryland, College Park, MD

5A9 SODIUM SOURCE DEVELOPMENT FOR PULSED POWER DRIVEN, PHOTOPUMPED NA/NE X-RAY LASER EXPERIMENTS
D.D. Hinshelwood, JAYCOR, Vienna, VA; P.G. Burkhalter, G. Cooperstein, D. Mosher, P.F. Ottinger, V.E. Scherrer, S.J. Stephanakis, F.C. Young, Naval Research Lab, Washington, DC;
C. Mehlman, Sachs-Freeman Associates, Inc., Landover, MD; and
B.L. Welch, U. of Maryland, College Park, MD

5A10 IONIZATION BALANCE STUDIES IN ANNULAR X-RAY LASER TARGETS
B.A. Hammel, T.W. Hussey, R.B. Spielman, and M.K. Matzen, Sandia National Labs, Albuquerque, NM

Wednesday Morning, 8 June 1988
9:40 AM Aspen

Oral Session 5B: INTENSE MICROWAVE SOURCES - II

Chairperson: C.D. Striffler

5B1-2 Invited Paper
EFFICIENT, MULTI-GIGAWATT, NARROW BANDWIDTH OPERATION OF THE REDITRON OSCILLATOR
H.A. Davis, R.D. Fulton, E.G. Sherwood, and T.J.T. Kwan, Los Alamos National Lab, Los Alamos, NM

5B3 EFFECTS OF MODULATED ELECTRON BEAMS AND CAVITIES ON REDITRONS
T.J.T. Kwan, H.A. Davis, R.D. Fulton, and E.G. Sherwood, Los Alamos National Lab, Los Alamos, NM

5B4 THE SIMULATED BEHAVIOR OF THE MAGNETICALLY INSULATED TRANSMISSION LINE OSCILLATOR
B.M. Marder, Sandia National Lab, Albuquerque, NM

5B5 HIGH-POWER MICROWVE GENERATION FROM A FRQUENCY-STABILIZED VIRTUAL CATHODE SOURCE
M.V. Fazio, R.F. Hoeberling, and J. Kinross-Wright, Los Alamos National Lab, Los Alamos, NM

5B6 PHASE LOCKING VIRCATOR AMPLIFIER THEORY
W-Y. Woo, D. Price, and H. Sze, Physics International Co., San Leandro, CA

5B7 MODE AND PHASE LOCKING OF A CAVITY VIRCATOR BY INJECTED MICROWAVE POWER FROM A RELATIVISTIC MAGNETRON
D. Price, H. Sze, W. Woo, D. Fittinghoff, and J. Benford, Physics International Co., San Leandro, CA

5B8 PHASE LOCKING OF ULTRA-HIGH POWER RELATIVISTIC MAGNETRONS
H. Sze, J. Benford, R.R. Smith, and W. Woo, Physics International Co., San Leandro, CA

5B9 RELATIVISTIC MAGNETRON RESEARCH
S.C. Chen, G. Bekefi and R.J. Temkin, Massachusetts Institute of Technology, Cambridge, MA

Wednesday Morning, 8 June 1988
9:40 AM - Room 424

Oral Session 5C: ELECTROMAGNETIC LAUNCHERS

Chairperson: J.E. Osher

5C1-2 Invited Paper
FUNDAMENTAL STUDIES TO REDUCE HIGH HEAT FLUX EROSION OF SURFACES
J. Gilligan, M. Bourham, O. Auciello, O. Hankins, B. Wehring, North Carolina State U., Raleigh, NC

5C3 ARC MOTION IN RAILGUN PLASMA ARMATURES
D. Keefer, U. of Tennessee Space Institute, Tullahoma, TN

5C4 STATUS REPORT ON THE STAR FIRE RAILGUN DEVELOPMENT PROJECT
R.S. Hawke, Lawrence Livermore Natl Lab, Livermore, CA; and
J.R. Asay, Sandia Natl Labs, Albuquerque, NM

5C5 Abstract Withdrawn

5C6 POWER BALANCE IN RAILGUN PLASMAS
T.V. Congedo and D.A. Sink, Westinghouse Electric Corporation, Pittsburgh, PA

5C7-8 Invited Paper
STRUCTURE AND DYNAMICS OF PLASMA ARMATURE OF RAILGUN MACROPARTICLE ACCELERATORS
G.A. Shvetsov, USSR Academy of Science, Novosibirsk, USSR

5C9 CURRENT DELOCALIZATION DUE TO ELECTRIC STRENGTH OF THE BARREL
E.F. Lebedev, V.E. Ostashev, V.I. Safonov, A.A. Polikov, A.V. Vlanov, and G.N. Fidelman, Institute for High Temperatures, Moscow, USSR

5C10 MEASUREMENTS OF THE ACCELERATION AND INTEGRITY OF FLAT-PLATE FLYERS PRODUCED BY ELECTRIC GUNS
J.E. Osher, R.E. Boberg, H.H. Chau, W.G. Von Holle, and R.C. Weingart, Lawrence Livermore Natl Lab, Livermore, CA

5C11 SPECTRAL DIAGNOSTICS IN THE UTSI RAILGUN PLAMS ARMATURE
A. Sedghinasab, D. Keefer, and H. Crowder, U. of Tennessee Space Institute, Tullahoma, TN

5C12 MUZZLE VELOCITY AND CONTACT POTENTIAL IN PLASMA ARMATURE RAILGUNS
D. Keefer, U. of Tennessee Space Institute, Tullahoma, TN

Wednesday Morning, 8 June 1988
9:40 AM - Room 426

Oral Session 5D: COMPUTERS IN PLASMA SCIENCE - I

Chairperson: A. Drobot

5D1 DIRECT AND ITERATIVE SOLVERS FOR THE SOLUTION OF UNSYMMETRIC SYSTEMS IN THE FINITE ELEMENT MODELING OF WEAK PLASMA TURBULENCE
S. Succi, G. Radicati and M. Benassi, IBM/European Center For Scientific and Engineering Computing, Rome, Italy

5D2 STRONGLY NONLINEAR OSCILLATIONS BELOW THE PLASMA FREQUENCY: INFLUENCE OF PHASE SPACE VORTICES
N.D. Suh, M.R. Feix, E. Fijalkow, P. Mineau, PMMS/CNRS, U. d'Orleans, France;
P. Bertrand, U. de Nancy, France; and
M. Shoucri, Hydro Quebec, Varennes, Canada

5D3 SIMULATIONS OF A REFLEX TRIODE
J. Ambrosiano and J. Geary, Berkeley Research Associates, Springfield, VA

5D4 PLASMA SIMULATIONS ON AN UNSTRUCTURED GRID
M.J. Fritts and A. Drobot, Science Applications International Corp., McLean, VA

5D5 CHARGE CONSERVATION IN ELECTROMAGNETIC PARTICLE-IN-CELL SIMULATIONS
D. Nielsen, Jr., Lawrence Livermore Natl Lab, Livermore, CA; and
A. Drobot, Science Applications Intl. Corp., McLean, VA

5D6 MULTI-SCALE PARTICLE-IN-CELL PLASMA SIMULATION: TIMESTEP CONTROL CRITERIA AND SOME TESTS
A. Friedman and S.L. Ray, Lawrence Livermore National Lab, Livermore, CA; and
C.K. Birdsall and S.E. Parker, U. of California, Berkeley, CA

5D7 THE CONCEPT OF A PIC CODE BASED ON BOUNDARY FITTED COORDINATES
T. Westermann, Institut fur Datenverarbeitung in der Technik, Karlsruhe, FRG

5D8-9 Panel Discussion
STATUS AND DIRECTION OF IMPLICIT PIC SIMULATIONS
D.W. Hewett and A.Friedman, Lawrence Livermore National Lab, Livermore, CA;
R.J. Mason, Los Alamos National Lab, Los Alamos, NM; and
D.C. Barnes, Science Applications Int'l Corp., Austin, TX

Wednesday Morning, 8 June 1988

Poster Session 5P1-9: INTENSE ELECTRON AND ION BEAMS

5P1 SIMULATIONS IN 3D OF HEAVY ION FUSION BEAM COMPRESSION WITH QUADRUPOLE FOCUSING
J.W-K. Mark, S.T. Brandon, and D. Nielson, Lawrence Livermore National Lab, Livermore, CA; and
C.L. Chang, A.T. Drobot, A. Mankofsky, Science Applications Int'l Corp., McLean, VA

5P2 ELECTROMAGNETIC COMPUTER SIMULATIONS OF COLLECTIVE ION ACCELERATION BY A RELATIVISTIC ELECTRON BEAM
M. Galvez and G.R. Gisler, Los Alamos Natl Lab, Los Alamos, NM

5P3 CONTROLLED EXCITATION OF MULTI-MODE SOLITON-LIKE WAVES IN AN ION-BEAM PLASMA SYSTEM
T. Honzawa, Utsunomiya U., Utsunomiya, Japan

5P4 COMPUTER SIMULATION OF ELECTRON BEAM INJECTION FROM THE SPACE SHUTTLE
C.S. Lin and J. Koga, Southwest Research Institute, San Antonio, TX

5P5 ELECTRON BEAM STABILITY IN COMPACT RECIRCULATING ACCELERATORS
T.P. Hughes and B.B. Godfrey, Mission Research Corp., Albuquerque, NM

5P6 PLASMA CHANNELS FOR ELECTRON BEAM TRANSPORT
R.F. Schneider, J.R. Smith, M.E. Moffatt, K.T. Nguyen, and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD

5P7 STABILITY OF AN INTENSE BEAM SYSTEM WITH NO APPLIED MAGNETIC FIELD
X. Zhang, C.D. Striffler, and R. Yao, U. of Maryland, College Park, MD

5P8 NUMERICAL SIMULATION OF INTENSE BEAM PROPAGATION AND PLASMOID FORMATION IN A LOCALIZED PLASMA SOURCE-VACUUM SYSTEM
R.L. Yao, J. Guillory, and C.D. Striffler, U. of Maryland, College Park, MD

5P9 SURFACE POTENTIAL OF A RELATIVISTIC ELECTRON BEAM ACCELERATOR IN THE IONOSPHERE
K.T. Nguyen and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD

Wednesday Morning, 8 June 1988

Poster Session 5P10-17: REVERSED FIELD PINCH AND MIRRORS

5P10 RADIAL TRANSPORT MODIFICATION IN PHAEDRUS-B TANDEM MIRROR USING FLOATING END RINGS
Y-J. Wen, R.A. Breun, D.A. Brouchous, N. Hershkowitz, R. Majeski, and H. Persing, U. of Wisconsin, Madison, WI

5P11 ICRF PLUGGING AND RADIAL TRANSPORT ON THE PHAEDRUS-B TANDEM MIRROR
H. Persing, R.P. Majeski, R.A. Breun, D.A. Brouchous, J.R. Conrad, Y.J. Wen, U. of Wisconsin, Madison, WI

5P12 THE MADISON SYMMETRIC TORUS
R.N. Dexter, S.C. Prager, and J.C. Sprott, U. of Wisconsin, Madison, WI

5P13 THE REVERSATRON II RFP
P. Greene and S. Robertson, U. of Colorado, Boulder, CO

5P14 C-X NEUTRAL SPECTRA FROM ZT-40M
C. Munson, Los Alamos Natl Lab, Los Alamos, NM;
P.G. Carolan, Euratom; and
C.A. Bunting, Culham Laboratory, England

5P15 RADIAL PROFILES OF ELECTRON TEMPERATURE AND DENSITY ON THE ZT-40M REVERSED FIELD PINCH
M.M. Pickrell, J.S. Sandoval, Los Alamos National Lab, Los Alamos, NM

5P16 EXPERIMENTS IN THE ZT-40M REVERSED FIELD PINCH
G.A. Wurden, P.G. Weber, C.P. Munson, Los Alamos National Lab; P.G. Carolan, Euratom; and L.C. Burkhardt and C.A. Bunting, Culham Laboratory, England

5P17 RECENT RESULTS FROM MBTX1C - THE THIN SHELL RFP AT CULHAM
B. Alper, Culham Laboratory, Abingdon, Oxon, UK

Poster Session 5P18-19: COMPACT TOROIDS - III

5P18 MULTICHORD AXIAL INTERFEROMETRY ON THE COAXIAL SLOW SOURCE
R.J. Smith, U. of Washington, Seattle, WA

5P19 ENERGY CONFINEMENT IN A WALL-CONFINED SPHEROMAK PLASMA
G. Craddock, D.C. Barnes, D. Nystrom, G. Bourianoff, and J. McBride, Science Applications Intl Corp., Austin, TX

Wednesday Morning, 8 June 1988

Poster Session 5P20-30: FAST OPENING SWITCHES - II

5P20 MICROWAVE INTERFEROMETRY OF PEOS PLASMA SOURCES
B.V. Weber, P.J. Goodrich, D.D. Hinshelwood, JAYCOR, Vienna, VA; R.J. Commisso and J.M. Neri, Naval Research Lab, Washington, DC

5P21 DIRECT MEASUREMENT OF PEOS ION DENSITY DISTRIBUTION USING RESONANT HOLOGRAPHIC INTERFEROMETRY
R.C. Hazelton and E.J. Yadlowsky, HY-Tech Research Corp., Radford, VA

5P22 NUMERICAL SIMULATION OF THE PBFA-II PLASMA OPENING SWITCH
P. Steen and A. Wilson, S-Cubed, La Jolla, CA

5P23 PLASMA OPENING SWITCH EXPERIMENTS ON SUPERMITE
C.W. Mendel, Jr., J.P. Quintenz and S.E. Rosenthal, Sandia National Labs, Albuquerque, NM; and M.E. Savage, U. of New Mexico, Albuquerque, NM

5P24 PLASMA OPENING SWITCH STUDIES OF THE APPLIED B_z DIODE ON THE LION ACCELERATOR
C.K. Struckman, B.R. Kusse, D.D. Meyerhofer, and G. Rondeau, Cornell University, Ithaca, NY

5P25 REFLEX SWITCH EXPERIMENTS WITH CAPACITOR BANK DRIVERS
J.S. Levine, J.M. Creeden, M. Krishnan, K.D. Pearce, P.S. Sincerny, Physics International Co., San Leandro, CA

5P26 IMPROVED PERFORMANCE OF A PLASMA FILLED DIODE WHEN DRIVEN BY A PEOS
J.R. Goyer, G. Barreto, P.S. Sincerny and M. Krishnan, Physics International Co., San Leandro, CA

5P27 FAST MARX DRIVER FOR INDUCTIVE STORE OPENING SWITCH ELECTRON BEAM GENERATOR
P.S. Sincerny, J.S. Levine, J.R. Goyer, M. Krishnan, K. Pearce, G. Barreto, and J. Douglas, Physics International Co., San Leandro, CA

5P28 EXPERIMENTS WITH EXPLOSIVELY-FORMED FUSES IN FLUX-EFFICIENT CONFIGURATIONS
J.H. Goforth, S.P. Marsh, and R.E. Reinovsky, Los Alamos National Labs, Los Alamos, NM

5P29 HIGH PERFORMANCE FUSE OPENING SWITCHES FOR MAGNETIC FLUX COMPRESSION GENERATOR APPLICATIONS
R.E. Reinovsky, I.R. Lindemuth, M.L. Hodgdon, and J.E. Vorthman, Los Alamos National Lab, Los Alamos, NM

5P30 HIGH PERFORMANCE FUSE OPENING SWITCHES FOR MAGNETIC FLUX COMPRESSION GENERATOR APPLICATIONS: THEORY AND COMPUTATION
I.R. Lindemuth, R.E. Reinovsky, M.L. Hodgdon, and J.E. Vorthman, Los Alamos National Lab, Los Alamos, NM

Wednesday Afternoon, 8 June 1988
2:00 PM - West Ballroom

PLASMA SCIENCE HISTORY 6H

HISTORY OF THE Z-PINCH

R.H. Lovberg
University of California, San Diego, CA

Chairperson: J. Benford

Wednesday Afternoon, 8 June 1988
2:50 PM - Cedar

Oral Session 6A: MAGNETOHYDRODYNAMICS

Chairperson: J.N. Chapman

6A1-2 Invited Paper
AN OVERVIEW OF DOE AND SDIO MHD PROGRAM ACTIVITIES
G.G. Elia, Pittsburgh Energy Technology Center, Pittsburgh, PA

6A3 A NUCLEAR SPACE-BASED DISK MHD POWER SYSTEM WITH VERY HIGH ENERGY EXTRACTION
J.F. Louis, Massachusetts Institute of Technology, Cambridge, MA; R.R. Holman, Westinghouse Electric Corp. AESD, Pittsburgh, PA

6A4 MULTIMEGAWATT DISK GENERATOR SYSTEM FOR SPACE APPLICATIONS
A. Solbes and H. Iwata, TRW, Inc., Redondo Beach, CA

6A5 ANALYSIS OF MHD FLUCTUATIONS IN A HIGH INTERACTION GENERATOR
B.C. Winkleman, J.T. Lineberry, and Y.C.L. Wu, U. of Tennessee Space Institute, Tullahoma, TN

6A6 THE SEED MATERIAL NUMBER DENSITY AND PLASMA TEMPERATURE PROFILE IN THE BOUNDARY LAYER OF AN MHD CHANNEL
Y. Aoki, H. Kitagawa, E. Nakamura, E. Oka, K. Sumi, S. Oikawa, T. Kasahara, N. Kayukawa and H. Yamazaki, Hokkaido U., Sapporo, Japan

6A7 AN IMPROVEMENT OF SiC INSULATOR PERFORMANCES FOR MHD GENERATOR CHANNELS
T. Okuo, T. Ookouchi, and Y. Aoki, Hokkaido U., Sapporo, Japan

6A8 SUITABILITY OF INDIAN COAL FOR COAL-FIRED MHD GENERATORS
B.K. Sawhney and S.S. Verma, Indian Institute of Technology, New Delhi, India

Wednesday Afternoon, 8 June 1988
2:50 PM - Aspen

Oral Session 6B: INTENSE ION BEAMS AND APPLICATIONS

Chairperson: J. Maenchen

6B1 PROTON BEAM FOCUSING WITH A RADIAL APPLIED B-FIELD ION DIODE ON PBFA II
D.J. Johnson, T.R. Lockner, R.J. Leeper, J.E. Maenchen, C. Ruiz, W.A. Stygar, T.A. Mehlhorn, S.E. Rosenthal, R.S. Coats, and J.P. Quintenz, Sandia National Labs, Albuquerque, NM

6B2 ION ACCELERATION IN AN UNMAGNETIZED REFLEX TRIODE CONFIGURATION
R. Stringfield, F. Begay, G. Morgan, R. Wheat and M.A. Yates, Los Alamos National Lab, Los Alamos, NM

6B3 THOMSON SPECTROMETER STUDIES OF COLLECTIVELY ACCELERATED IONS
M.J. Rhee, F. Begay, and T.A. Fine, U. of Maryland, College Park, MD

6B4 THEORETICAL PREDICTION OF THE SPOTSIZE AND FOCAL LENGTH OF A POST-TRANSPORT Z-DISCHARGE FOCUSING CELL WITH NONUNIFORM CURRENT DENSITY DISTRIBUTION
J.J. Watrous, P.F. Ottinger, and D. Mosher, Naval Research Lab, Washington, DC

6B5 PLASMA CHANNELS FOR THE PROPAGATION OF INTENSE LIGHT ION BEAMS
R.R. Peterson and G.A. Moses, U. of Wisconsin, Madison, WI

6B6-7 Invited Paper
HYDRODYNAMIC EXPERIMENTS FOR PBFA II
F.C. Perry, Sandia National Lab, Albuquerque, NM

6B8-9 Invited Paper
ION BEAM FUSION TARGETS WHICH UTILIZE DIRECT DRIVE EFFICIENCY WHILE OPTIMIZING SYMMETRY AS WELL AS THOSE WHICH UTILIZE POLARIZED DT-FUEL
J.W-K. Mark, Lawrence Livermore National Lab, Livermore, CA

Wednesday Afternoon, 8 June 1988
2:50 PM - Room 424

Oral Session 6C: LASER-PLASMA INTERACTIONS AND PLASMA DIAGNOSTICS - II

Chairperson: J. Alcock

6C1 2-D MODELING OF LASER ABLATION AND FRAGMENTATION OF BIOLOGICAL CALCULI
S.J. Gitomer and R.D. Jones, Los Alamos National Labs, Los Alamos, NM

6C2 PICOSECOND KrF LASER INTERACTION WITH SOLID TARGETS
R.A. Smith, V. Barrow, J. Edwards, G. Kiehn, J. Wark, O. Willi, Imperial College of Science and Technology, London, England; J. Barr, N. Everall, C. Hooker, I. Ross, M. Shaw, E. Turcu, Rutherford Appleton Laboratory, Chilton, England

6C3 EXPERIMENTAL PLASMA TEMPERATURE MEASUREMENTS: THE EFFECTS OF ATMOSPHERIC COMPOSITION ON QUENCHING
B.A. Detering and J.A. Batdorf, EG&G Idaho, Inc., Idaho Falls, ID

6C4 EFFECTS OF REFRACTION ON TEMPERATURE MEASUREMENTS OF THERMAL PLASMAS BY HOLOGRAPHIC INTERFEROMETRY
K. Etemadi, G.Y. Zhao, D.M. Benenson, State U. of New York, Buffalo, NY

NO SESSION 6D

Wednesday Afternoon, 8 June 1988

Poster Session 6P31-37: PLASMA WAVES AND INSTABILITIES - II

6P31 ENVELOPE SOLITONS IN NONUNIFORM MEDIA
H.H. Kuehl and C.Y. Zhang, U. of Southern California, Los Angeles, CA

6P32 TUNNELLING OF TRANSMITTED ION ACOUSTIC SOLITONS THROUGH SPACE CHARGE SHEATHS
K. Yoshida, Y. Nishida, and T. Nagasawa, Utsunomiya U., Utsunomiya, Tochigi, Japan

6P33 Abstract Withdrawn

6P34 STANDING ION WAVES PRODUCED BY ION SOURCES IN THE PRESENCE OF MAGNETIC FIELD
M. Ghoranneviss, M. Moradshahi, and A. Shirazpour, The Islamic Azad U. of Karaj, Tehran, Iran

6P35 SOME POSSIBLE PARAMETRIC DECAY INSTABILITIES DURING ELECTRON CYCLOTRON RESONANCE HEATING OF PLASMAS
R.P. Sharma and Y.K. Tripathi, Indian Institute of Technology, New Delhi, India

6P36 PARAMETRIC INSTABILITIES DURING ION-BERNSTEIN AND FAST WAVE (WHISTLER) HEATING IN PLASMAS
R.P. Sharma and A. Kumar, Indian Institute of Technology, New Delhi, India

6P37 MODEL ELECTRON VELOCITY DISTRIBUTIONS IN MIRROR-CONFINED PLASMAS
A.C. Saxena, G.P. Gupta, and V.K. Rohatgi, Bhabha Atomic Research Centre, Bombay, India

Wednesday Afternoon, 8 June 1988

Poster Session 6P38-45: PLASMA FOCUS

6P38 RESULTS FROM AFWL 230 kJ COAXIAL PLASMA GUN EXPERIMENTS
D.J. Hall, W.L. Baker, J.D. Beason, C.J. Clouse, J.H. Degnan, D. Dietz, K.E. Hackett, P.L. Higgins, J.L. Holmes, D.W. Price, and P.M. Ranon, AFWL Kirtland AFB, NM; and J.D. Graham and E.A. Lopez, Maxwell Laboratories, San Diego, CA

6P39 DYNAMICS OF ENERGETIC ELECTRON BEAMS IN THE DPF-78 PLASMA FOCUS
C. Deeney, U. Stuttgart, Stuttgart, FRG; and P. Choi, Blackett Labs, Imperial College, London, UK

6P40 A HIGH NEUTRON OUTPUT DENSE PLASMA FOCUS
E.J.T. Burns, S.M. Falacy, R.A. Hill, and P.D. Thacher, Sandia National Labs, Albuquerque, NM; H.A. Koehler, Lawrence Livermore Natl Lab, Livermore, CA; and B. Davis, EG&G Energy Measurements, Los Alamos, NM

6P41 DISTRIBUTION OF PROTONS FROM A PLASMA FOCUS IN VELOCITY-TIME SPACE BY TIME-RESOLVED THOMSON SPECTROSCOPY
D.J. Weidman and M.J. Rhee, U. of Maryland, College Park, MD

6P42 SPECTROSCOPIC INVESTIGATION OF PLASMA PARAMETERS IN PLASMA FOCUS EXPERIMENTS
F. Begay, T.A. Fine, H.R. Griem, R.A. Hess, J. Moreno, M.J. Rhee, U. of Maryland, College Park, MD; and R.F. Schneider, Naval Surface Warfare Center, Silver Spring, MD

6P43 THE PLASMA FOCUS AS A COMPACT ACCELERATOR/PLASMA-TARGET SYSTEM: EXPERIMENTAL EVIDENCE
J.S. Brzosko and V. Nardi, Stevens Institute of Technology, Hoboken, NJ

6P44 CURRENT ACCRETION IN A ION AND CLUSTER EMITTING PINCH WITH FUSION REACTIONS
A. Bortolotti, J.S. Brzosko, F. Mezzetti, V. Nardi, C. Powell, and D. Zeng, Stevens Institute of Technology, Hoboken, NJ

6P45 EXPERIMENTAL STUDY OF THE FOCAL REGION OF A HEMISPHERICAL CONVERGING ION-BEAM-PLASMA SYSTEM
J.M. Peterson and N.L. Oleson, U. of South Florida, Tampa, FL

Wednesday Afternoon, 8 June 1988

Poster Session 6P46-50: COMPUTERS IN PLASMA SCIENCE - II

6P46 PLASMA-VACUUM INTERFACES IN HYBRID CODES
G.J. Rickard and M.G. Haines, Blackett Lab, Imperial College, London, UK

6P47 2.5D EM DIRECT IMPLICIT PIC SIMULATION
D.W. Hewett and A.B. Langdon, Lawrence Livermore National Lab, Livermore, CA

6P48 THE IMPLICIT ANTHEM CODE FOR PULSED POWER MODELING
R.J. Mason, Los Alamos National Lab, Los Alamos, NM

6P49 NUMERICAL STUDIES OF TOROIDICITY SIMULATION IN A LINEAR HELIAC
B.A. Nelson, F.L. Ribe, and G. Spanjers, U. of Washington, Seattle, WA; and D.C. Barnes, Science Applications Intl. Corp., Austin, TX

6P50 A METHOD FOR CALCULATING SUPERSONIC FLOWS IN PLASMAS WITHOUT USING ARTIFICIAL VISCOSITY
L. Bilbao, FCEN-UBA/CONICET, Buenos Aires, Argentina

Wednesday Afternoon, 8 June 1988

Poster Session 6P51-57: PLASMA-BASED ACCELERATORS

6P51 CHARGE EMISSION AND DAMAGE FROM PICOSECOND LASER PULSES ON METALS
N.K. Sherman, F.A. Hegmann, and P.B. Corkum, National Research Council of Canada, Ottawa, Ontario, Canada

6P52 NUMERICAL SIMULATION OF COLLECTIVE ION ACCELERATION IN A LOCALIZED PLASMA SOURCE-VACUUM SYSTEM
R.L. Yao and C.D. Striffler, U. of Maryland, College Park, MD

6P53 NUMERICAL SIMULATION OF THE PLASMA WAKE FIELD ACCELERATOR USING FRIEZR
J. Krall, Science Applications Intl. Corp.; and
G. Joyce and P. Sprangle, Naval Research Lab, Washington, DC

6P54 RELATIVISTIC FOCUSING AND BEAT WAVE PHASE VELOCITY CONTROL IN THE PBWA
E. Esarey and A. Ting, Berkeley Research Assoc., Springfield, VA;
P. Sprangle, Naval Research Lab, Washington, DC

6P55 THE PLASMA WAKE FIELD ACCELERATOR WITH AN AXIAL MAGNETIC FIELD
A. Ting and E. Esarey, Berkeley Research Assoc., Springfield, VA;
P. Sprangle, Naval Research Lab, Washington, DC

6P56 EFFECTS OF RF RISE TIME ON CROSS FIELD ACCELERATION IN MICROWAVE PLASMA INTERACTION EXPERIMENTS
Y. Nishida, Utsunomiya U. Utsunomiya, Tochigi, Japan; and
C.W. Domier and N.C. Luhmann, Jr., U. of California,
Los Angeles, CA

6P57 PROGRESS ON LASER PLASMA ACCELERATORS
C. Joshi, T. Katsouleas, C. Clayton, W. Mori, J. Dawson, and
F. Chen, U. of California, Los Angeles, CA

Wednesday Afternoon, 8 June 1988

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6P58 PROTON RING TRANSLATION IN A MAGNETIZED PLASMA: IMPLICATIONS FOR PROTON RING/FRC MERGING
E. Schamiloglu, J.B. Breenly, and D.A. Hammer, Cornell U.,
Ithaca, NY