

Monday Morning, 21 May 1990

8:30 am - Regency Ballroom

***"TO NEPTUNE AND BEYOND --
A PERSONAL VIEW OF EXPLORATION OF
THE SOLAR SYSTEM, PLANETS, AND PLASMAS"***

***Prof. James A Van Allen
University of Iowa***

Chairman: M. S. Silevitch

Monday Morning, 21 May 1990
9:40 am -- Regency Ballroom G&H

Oral Session 1A
TOKAMAKS AND STELLARATORS and REVERSE-FIELD PINCH
Chairman: J.C. Glowienka and S. Robertson

- 1 A-1&2 Invited**
STATUS OF STUDIES IN THE ATF TORSATRON
J.C. Glowienka and the ATF Group
Oak Ridge National Laboratory, Oak Ridge, TN
- 1 A-3** INITIAL MEASUREMENTS OF EDGE PLASMA TURBULENCE ON ATF
T. Uckan, C. Hidalgo*, J.D. Bell, G.R. Dyer, J.H. Harris,
J.B. Wilgen, Oak Ridge National Laboratory, Oak Ridge, TN
*Asociacion EURATOM/CIEMAT, Madrid, Spain
Ch.P. Ritz, K. Carter, T.L. Rhodes, A.J. Wootton
University of Texas, Austin, TX
- 1 A-4** EFFECTS OF EXTERNAL INJECTED TOROIDAL MAGNETIC FLUX ON THE
DYNAMO ACTION IN REVERSED-FIELD PINCH PLASMA
E. Hotta, M. Suzuki, J. Lin, A. Mizuno
Tokyo Institute of Technology, Tokyo, Japan
- 1 A-5** MULTI-LAYER MODELING OF POLOIDAL CURRENT DRIVE BY TRANSVERSE
ROTATING MAGNETIC FIELD IN CYLINDRICAL PLASMA
J. Lin, A. Mizuno, K. Arimoto, A. Tajima, M. Saito, K. Yunoki,
M. Suzuki, E. Hotta, Tokyo Institute of Technology, Tokyo Japan
- 1 A-6** RESULTS FROM THE MST REVERSED FIELD PINCH WITH THE DESIGN
POLOIDAL FIELD WINDINGS
T.D. Rempel, A.F. Almagri, S. Assadi, J.A. Beckstead, R.N. Dexter,
D.J. Den Hartog, G. Chartas, S.A. Hokin, T.W. Lovell, S.C. Prager,
J.S. Sarff, E. Scime, W. Shen, C.W. Spragins, J.C. Sprott,
F. Venneri, University of Wisconsin, Madison, WI
- 1 A-7&8 Invited**
**A PERSPECTIVE ON TRANSPORT DYNAMICS IN THE
REVERSED FIELD PINCH**
K.F. Schoenberg, Los Alamos National Laboratories, Los Alamos, NM

Monday Morning, 21 May 1990
9:40 am -- Room #203

Oral Session 1B
PLASMA WAVES AND INSTABILITIES and
BASIC PLASMA PHENOMENA
Chairman: O. Ishihara and J. Borovsky

- 1 B - 1 & 2 **Invited**
TIME-DEPENDENT PHASE CONJUGATION AND FOUR-WAVE
MIXING IN PLASMA
M.V. Goldman, Univ. of Colorado, Boulder, CO
E.A. Williams, Lawrence Livermore National Lab., Livermore, CA
- 1 B - 3 EFFECTS OF THERMIONIC ELECTRON EMISSION ON THE PLASMA SHEATH
L.A. Schwager*, D.M. Tung**, W.L. Hsu**
*Supported in part by an appointment to the
U.S. Dept. of Energy Fusion
Energy Postdoctoral Research Program,
Administered by Oak Ridge
Associated Universities.
**Sandia National Laboratories, Livermore, CA
- 1 B - 4 TRANSITION FROM MOVING TO STATIONARY DOUBLE LAYERS IN A SINGLE-
ENDED Q MACHINE
B. Song, N. D'Angelo, R.L. Merlino
University of Iowa, Iowa City, IA
- 1 B - 5 SPECTROSCOPIC MEASUREMENTS OF ION ACOUSTIC DECAY
INSTABILITIES IN LASER PRODUCED PLASMA
K. Mizuno, W. Seka*, R. Bahr*, R.P. Drake, P.E. Young**,
J.S. DeGroot, K. Estabrook**
Plasma Physics Research Institute and UC Davis, LLE*
(University of Rochester), and
Lawrence Livermore National Lab**
- 1 B - 6 EXCITATION OF IONIZATION INSTABILITY IN MICROWAVE
DISCHARGE PLASMA
Y.S. Zhang and S.P. Kuo
Polytechnic University, Weber Research Institute,
Farmingdale, NY
- 1 B - 7 EFFECT OF TURBULENT COLLISIONS ON DIFFUSION IN STATIONARY
PLASMA TURBULENCE
X. Xia and O. Ishihara, Texas Tech University, Lubbock, TX
- 1 B - 8 WHISTLER MODE FLUX ROPES IN A LABORATORY PLASMA
J.M. Urrutia and R.L. Stenzel, UCLA, Los Angeles, CA
- 1 B - 9 & 10 **Invited**
STEEPENING AND REFRACTION OF PRESSURE-
DRIVEN LOW FREQUENCY TURBULENCE
R.L. Stenzel, Dept. of Physics, UCLA, Los Angeles, CA

Monday Morning, 21 May 1990
9:40 am -- Rooms #210-211

Oral Session 1C
GASEOUS ELECTRONICS:
FUNDAMENTAL PROCESSES - I
Chairman: P.F. Williams

- Invited**
- 1 C -1&2 **NUMERICAL TECHNIQUES FOR GAS DISCHARGE SIMULATION**
D.B. Graves
University of California, Berkeley, Berkeley, CA
- 1 C -3 SIMULATION OF REMOTE PLASMA ACTIVATED PROCESSING USING
ELECTRON CYCLOTRON RESONANCE EXCITED DISCHARGES
Y. Weng and M.J. Kushner
University of Illinois, Champaign, IL
- 1 C -4 MOVING MACRO SURFACE CHARGES, AN ALGORITHM FOR SPACE CHARGE
CALCULATIONS
C. Schultheiss, Kernforschungszentrum Karlsruhe GmbH, INR
Federal Republic of Germany
- 1 C -5 PREBREAKDOWN IN THE HOLLOW CATHODE PSEUDOSPARK DISCHARGE
K. Mittag, C. Schultheiss, and P. Choi*
Kernforschungszentrum Karlsruhe, IDT and INR, Karlsruhe, FRG
*The Blackett Laboratory, Imperial College, London, UK
- 1 C -6 PLASMA-CATHODE INTERACTION IN SUPERDENSE GLOW DISCHARGES
W. Hartman, O. Almen, H. Bauer, K. Frank, A. Linsenmeyer,
J. Christiansen, University of Erlangen-Nurnberg, Erlangen, FRG
- 1 C -7 CHARACTERISTICS OF UV-LASER TRIGGERED PSEUDOSPARK
SWITCH PLASMA
H. Saruwatari and M. Obara
Keio University, Yokohama, Japan
- 1 C -8 AN AIR SPARK GLOW PHASE MODEL
A.E. Rodriguez, W.L. Morgan, K.J. Touryan, W.M. Moeny
Tetra Corporation, Albuquerque, NM
T.H. Martin, Sandia National Laboratory, Albuquerque, NM

Monday Morning, 21 May 1990
9:40 am -- Room #202

Oral Session 1D
SPACE PLASMA DIAGNOSTIC TECHNIQUES
Chairman: M. S. Silevitch

- 1 D - 1 & 2 **Invited**
DOUBLE PROBE MEASUREMENTS OF ELECTRIC FIELDS IN THE MAGNETOSPHERE
L.P. Block and C.-G. Falthammar,
Royal Institute of Technology, Stockholm, Sweden
- 1 D - 3 SATELLITE PROBE ELECTRIC FIELD MEASUREMENTS AND THE EFFECTS OF SPACE CHARGE
D. Diebold, N. Hershkowitz, J.DeKock, T. Intrator, M.-K. Hsieh
University of Wisconsin, Madison, WI
- 1 D - 4 CURRENT COLLECTION IN A SPACECRAFT WAKE LABORATORY AND COMPUTER SIMULATIONS OF SPACE PLASMAS
C. Chan*, D. Cooke+, J. Browning*, S. Meassick*,
M.F. Tautz#, M.A. Morgan*, D.L. Enloe+
*Center for Electromagnetics Research,
Northeastern University, Boston, MA
+Air Force Geophysics Laboratory, Hanscom AFB, MA
#Radex Inc., Carlisle, MA
- 1 D - 5 & 6 **Invited**
HIGH TIME RESOLUTION MEASUREMENTS IN THE MAGNETOSPHERE
C.A. Cattell, C.W. Carlson, F.S. Mozer, M.A. Temerin, J.R. Wygant
University of California at Berkeley, Berkeley, CA
- 1 D - 7 & 8 **Invited**
AURORAL OPTICAL OBSERVATIONS OF PLASMA PROCESSES
J.S. Murphree, University of Calgary, Alberta, Canada
- 1 D - 9 & 10 **Invited**
GROUND BASED OBSERVATIONS TO PROBE THE IONOSPHERIC AND MAGNETOSPHERIC PLASMAS
P.J. Tanskanen, University of Oulu, Oulu, Finland

Monday Morning, 21 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session, 1P1
MAGNETIC FUSION DEVICE DESIGN

- 1 P 1 - 1 COMPACT IGNITION TOKAMAK EDGE AND DIVERTOR MODELING
D.P. Stotler, M. Ulrickson, D. Coster, A.B. Ehrhardt
B.J. Braams,* C.F.F. Karney
Princeton University, Princeton, NJ
*Courant Institute, New York University, New York, NY
- 1 P 1 - 2 EFFECTS OF FUSION-PRODUCTION ALPHA PARTICLES ON PLASMA
STABILITY IN THE FUSION IGNITION EXPERIMENT IGNITEX
Z. Guo¹, R. Carrera, G.Y. Fu², G. Miley³, E. Montalvo,
M.N. Rosenbluth⁴, J.W. Van Dam
The University of Texas at Austin, Austin, TX
¹Institute of Physics, Academia Sinica, Beijing, PR China
²CRPP, Switzerland
³University of Illinois, Urbana, IL
⁴UC San Diego, San Diego, CA
- 1 P 1 - 3 SIMULATION OF THE IGNITION PULSE IN THE SMALL AND LARGE
VERSIONS OF THE IGNITEX EXPERIMENT
E. Montalvo, R. Carrera, M.N. Rosenbluth
The University of Texas at Austin, Austin, TX
- 1 P 1 - 4 STRAY FIELD PERTURBATIONS INDUCED BY THE POLOIDAL
FIELD MAGNET LEADS IN IGNITEX
E. Montalvo, R. Carrera, J.Q. Dong*, M. Driga, K.T. Hsieh,
R. Khayrutdinov**, A. Walls, W.F. Weldon
The University of Texas at Austin, Austin, TX
*Southwestern Institute of Physics, Leshan, PR China
**Kurchatov Atomic Energy Institute, Troitsk, Moscow, USSR
- 1 P 1 - 5 ANALYSIS OF A PLASMA DISRUPTION IN THE FUSION IGNITION
EXPERIMENT IGNITEX
J.Q. Dong*, E. Montalvo, R. Carrera, R. Khayrutdinov**,
M.N. Rosenbluth***
The University of Texas at Austin, Austin, TX
*Southwestern Institute of Physics, Leshan, Sichuan, PR China
**Kurchatov Atomic Energy Institute, Troitsk, Moscow, USSR
***UC San Diego, La Jolla, CA

- 1 P 1 - 6 ELECTROMECHANICAL ANALYSIS OF THE TOROIDAL FIELD MAGNETS
IN THE SMALL AND LARGE VERSIONS OF IGNITEX
K.T. Hsieh, R. Carrera, E. Montalvo, W.F. Weldon, M.D. Werst
Center for Electromechanics
The University of Texas at Austin, Austin, TX
- 1 P 1 - 7 ANALYSIS OF THE POLOIDAL FIELD MAGNET SYSTEM LEADS IN
THE IGNITEX EXPERIMENT
K.T. Hsieh, E. Montalvo, R. Carrera, D. Dong, M.D. Driga,
W.A. Walls, W. F. Weldon
The University of Texas at Austin, Austin, TX
- 1 P 1 - 8 PRELIMINARY ANALYSIS OF THE VACUUM VESSEL IN THE FUSION
IGNITION EXPERIMENT IGNITEX
J.Q. Dong*, E. Montalvo, R. Arslanoglu, E. Becker, R. Carrera,
R. Khayrudinov**, A. Walls, W.F. Weldon
The University of Texas at Austin, Austin, TX
*Southwestern Institute of Physics, Leshan, Sichuan, PR China
**Kurchatov Atomic Energy Institute, Troitsk, Moscow, USSR
- 1 P 1 - 9 FABRICATION AND ASSEMBLY OF A SINGLE TURN COIL TOKAMAK
M.D. Werst, W.A. Walls, W.F. Weldon
Center for Electromechanics
The University of Texas at Austin, Austin, TX
- 1 P 1 - 10 AXIAL PRELOADING OF A 20 TESLA PROTOTYPE OF A SINGLE TURN
TOKAMAK TOROIDAL FIELD COIL
G.W. Brunson and W. F. Weldon, Center for Electromechanics
The University of Texas at Austin, Austin, TX
- 1 P 1 - 11 A 1 GJ PULSED HOMOPOLAR GENERATOR TECHNOLOGY DEMONSTRATION
FOR THE IGNITEX IGNITION EXPERIMENT
W.A. Walls, J.H. Gully, W.F. Weldon, H.H. Woodson
Center for Electromechanics
The University of Texas at Austin, Austin, TX
- 1 P 1 - 12 ENERGY TRANSFER FROM A HOMOPOLAR GENERATOR TO A SINGLE
TURN COIL TOROIDAL FIELD MAGNET
R.L. Sledge, G.W. Brunson, W.A. Walls, M.D. Werst, W.F. Weldon
Center for Electromechanics
The University of Texas at Austin, Austin, TX
- 1 P 1 - 13 DIAGNOSTIC SYSTEM FOR A 20 TESLA SINGLE TURN COIL
MAGNET PROTOTYPE
M.J. Johnson, W.F. Weldon, M.D. Werst
Center for Electromechanics
The University of Texas at Austin, Austin, TX

- 1 P 1 - 14 COMPARISON OF THE NUCLEAR SAFETY ASPECTS OF A
FUSION IGNITION EXPERIMENT AND A FISSION RESEARCH FACILITY
T. Parish and G. Schlapper
Texas A&M University, College Station, TX
R. Carrera, R. Charbeneau, D. Klein
The University of Texas at Austin, Austin, TX
- 1 P 1 - 15 ASSESSMENT OF STRUCTURAL ACTIVATION IN THE OPERATION OF THE
FUSION IGNITION EXPERIMENT IGNITEX
D.E. Palmrose and T.A. Parish
Texas A&M University, College Station, TX
R. Carrera and N.E. Hertel
The University of Texas at Austin, Austin, TX
- 1 P 1 - 16 NEUTRON STREAMING ANALYSIS IN THE FUSION IGNITION
EXPERIMENT IGNITEX
T. Parish and B. Shofolu
Texas A&M University, College Station, TX
D. Booth, R. Carrera, N. Hertel
The University of Texas at Austin, Austin, TX
- 1 P 1 - 17 MONTE CARLO ANALYSIS OF PLASMA-SURFACE INTERACTIONS
IN A FUSION IGNITION EXPERIMENT
C.A. Ordonez, R. Carrera, M.E. Oakes
The University of Texas at Austin, Austin, TX
- 1 P 1 - 18 SIMULATION OF SURFACE RESPONSE AT THE FIRST WALL OF A
FUSION IGNITION EXPERIMENT
C.A. Ordonez, R. Carrera, M.E. Oakes
The University of Texas at Austin, Austin, TX
- 1 P 1 - 19 FIRST WALL THERMOMECHANICAL STRESS ANALYSIS IN A
FUSION IGNITION EXPERIMENT
G. Rodin, R. Carrera, J.Q. Dong*, J. Howell, Y.L. Hwang,
E. Montalvo, C. Ordonez
The University of Texas at Austin, Austin, TX
*Southwestern Institute of Physics, Leshan, Sichuan, PR China
- 1 P 1 - 20 BASIC DESIGN OF THE IN-VESSEL REMOTE MAINTENANCE SYSTEM FOR
A FUSION IGNITION EXPERIMENT
J.Q. Ling, W.D. Booth, R. Carrera, D. Tesar
The University of Texas at Austin, Austin, TX
- 1 P 1 - 21 ACTIVE PLASMA CONTROL IN THE FUSION IGNITION EXPERIMENT IGNITEX
R. Khayrutdinov*, J. Dong**, E. Montalvo, R. Carrera, D.W. Booth
The University of Texas at Austin, Austin, TX
*Kurchatov Atomic Energy Institute, Troitsk, Moscow, USSR
**Southwestern Institute of Physics, Leshan, Sichuan, PR China

- 1 P 1 - 22 IMPROVED PLASMA BREAKDOWN BY RESONANT-CAVITY
MODES IN AN IGNITION TOKAMAK
S.E. Eways, W.D. Booth, R. Carrera, M.E. Oakes
The University of Texas at Austin, Austin, TX
E.F. Jaeger, Oak Ridge National Laboratory, Oak Ridge, TN
- 1 P 1 - 23 OPERATIONAL PROCEDURES FOR THE FUSION IGNITION
EXPERIMENT IGNITEX
W.D. Booth, R. Carrera, G. Hallock, M.E. Oakes, C. Ordonez
The University of Texas at Austin, Austin, TX
S.S. Medley, Princeton University, Princeton NJ
J. Helton and J. Leuer, General Atomic, San Diego, CA
M.N. Rosenbluth, University of California, San Diego, CA
- 1 P 1 - 24 OUT-VESSEL MAINTENANCE FOR THE FUSION IGNITION
EXPERIMENT IGNITEX
W.D. Booth, G. Brunson, R. Carrera, R. Sledge, A. Walls,
M. Werst, W.F. Weldon
The University of Texas at Austin, Austin, TX
T. Parish
Texas A&M University, College Station, TX
- 1 P 1 - 25 PRELIMINARY CONSTRUCTION AND COST ANALYSIS FOR THE IGNITEX
FUSION FACILITY
P. Cooper, D. Booth, J. Borcharding, R. Carrera, J. Gully,
T. Parish*, J. Quinones, M. Raj, W.A. Walls, W.F. Weldon,
M. Werst, The University of Texas at Austin, Austin, TX
*Texas A&M University, College Station, TX
- 1 P 1 - 26 DESIGN AND SCALING OF A SIMPLE AND INEXPENSIVE FUSION
IGNITION EXPERIMENT
R. Carrera, W.D. Booth, J.Q. Dong*, M. Driga, K.T. Hsieh,
R. Khayrutdinov**, E. Montalvo, T.A. Parish***, G. Rodin,
J.W. Van Dam, A. Walls, W.F. Weldon, M. Werst
The University of Texas at Austin, Austin, TX
*Southwestern Institute of Physics, Leshan, Sichuan, PR China
**Kurchatov Atomic Energy Institute, Troitsk, Moscow, USSR
***Texas A&M University, College Station, TX
The University of Texas at Austin, Austin, TX

Monday Morning, 21 May 1990
9:40 am -- Calvin Simmons Ballroom

**Poster Session 1P2
PLASMA DIAGNOSTICS**

- 1 P 2 - 1 A 400 kV ELECTROSTATIC ENERGY ANALYZER FOR THE TEXT-UPGRADE
2 MeV HEAVY ION BEAM PROBE
A. Ouroua, R.L. Hickok, T.P. Crowley, K.A. Connor, J.F. Lewis,
P.E. McLaren, J.G. Schatz, J. Schwelberger
Rensselaer Polytechnic Institute, Troy, NY
- 1 P 2 - 2 ELECTRIC FIELD CHARACTERISTICS OF A 400 kV ELECTROSTATIC
ENERGY ANALYZER
P.E. McLaren, K.A. Connor, J.F. Lewis, R.L. Hickok, T.P. Crowley,
J.G. Schatz, Rensselaer Polytechnic Institute, Troy, NY
- 1 P 2 - 3 MICROWAVE INTERFEROMETER APPLIED TO PULSED RF OXYGEN PLASMA
A.M. Nasiruddin and P.D. Pedrow
Washington State University, Pullman, WA
- 1 P 2 - 4 SPARK GAP PRODUCED PLASMA DIAGNOSTICS
Hong-Young Chang, KAIST Physics Dept, Korea
- 1 P 2 - 5 FREE-ELECTRON DISTRIBUTION IN LASER-INDUCTED PLASMAS
M.A. Beik and T.J. Englert
University of Wyoming, Laramie, WY

Monday Morning, 21 May 1990
9:40 am -- Calvin Simmons Ballroom

**Poster Session 1P3
COMPUTERS IN PLASMA SCIENCE**

- 1 P3 - 1 A COURANT CONDITION-FREE MODIFIED PARTIALLY IMPLICIT METHOD
REVISED ELECTROMAGNETIC CODE **PS2M** FOR BOUNDED PLASMAS WITH
CONDUCTING WALLS
H. Abe, Ryukoku University, Japan
- 1 P3 - 2 A FINITE ELEMENT PARTICLE CODE ON AN UNSTRUCTURED GRID
J. Ambrosiano and S. Brandon
Lawrence Livermore National Laboratory, Livermore, CA
R. Lohner, The George Washington University, Washington, DC
- 1 P3 - 3 3-D FIELD AND PARTICLE SIMULATIONS WITH ARGUS
A. Mankofsky, C.L. Chang, A. Drobot, W. Grossmann,
M. Kress, A. Mondelli, J. Petillo
Science Applications International Corp., McLean, VA
S. Brandon, Lawrence Livermore National Lab., Livermore, CA
K. Ko, Stanford Linear Accelerator Center, Stanford, CA
- 1 P3 - 4 NEW BOUNDARY CONDITIONS FOR 3D RF MODELLING
K. Ko, E. Nelson, H. Fitze
SLAC, Stanford, CA
- 1 P3 - 5 3-D PARTICLE SIMULATIONS OF APPLIED-B ION DIODES
T.D. Pointon, D.B. Seidel, M.P. Desjarlais
Sandia National Laboratories, Albuquerque, NM
- 1 P3 - 6 RECENT DEVELOPMENT IN THE 3D, ELECTROMAGNETIC, PARTICLE-
IN-CELL CODE, QUICKSILVER
D.B. Seidel, M.L. Kiefer, R.S. Coats, T.D. Pointon, J.P. Quintenz,
W.A. Johnson, Sandia National Laboratories, Albuquerque, NM
- 1 P3 - 7 PARTICLE-IN-CELL SIMULATION OF A RADIOACTIVE POTENTIAL
PROBE IN WIND
Q.Y. Wang and P.D. Pedrow
Washington State University, Pullman, WA
- 1 P3 - 8 COMPUTER SIMULATION OF CROSS FIELD AMPLIFIERS
K. Eppley, Stanford Linear Accelerator Center, Stanford, CA
- 1 P3 - 9 A FINITE-VOLUME PARTICLE CODE FOR ELECTROMAGNETIC
PLASMA SIMULATIONS
D.E. Nielsen Jr., N. Madsen, J. Ambrosiano, S. Brandon
Lawrence Livermore National Laboratory, Livermore, CA

Monday Morning, 21 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session 1P4
ULTRAFAST Z-PINCHES and X-RAY LASERS

- 1 P 4 - 1 DENSE Z-PINCHES FROM D₂, CD₂ AND C FIBERS
J.D. Sethian, A.E. Robson, K.A. Gerber
Naval Research Laboratory, Washington, DC
A.W. DeSilva
University of Maryland and SFA, Inc.
- 1 P 4 - 2 TWO-DIMENSIONAL DYNAMICS OF SOLID FIBER Z-PINCHES:
HOT SPOTS, PHOTON EMISSION, AND OTHER DIAGNOSTICS FROM A
COMPUTATIONAL VIEWPOINT
I.R. Lindemuth, Los Alamos National Laboratory, Los Alamos, NM
- 1 P 4 - 3 THE MAGPIE DENSE Z-PINCH PROJECT
J. Chittenden, P. Choi, I. Mitchell, A.E. Dangor, M.G. Haines
The Blackett Laboratory, Imperial College, London
- 1 P 4 - 4 DENSE X-PINCH PLASMAS FOR X-RAY MICROLITHOGRAPHY
D.H. Kalantar, D.A. Hammer, N.Qi, K.C. Mittal
Cornell University, Ithaca, NY
- 1 P 4 - 5 GENERATION OF μ S-STABLE Z-PINCHES AT A TEMPERATURE IN THE
ORDER OF 200 eV
F. Hoffmann and C. Schultheiss
Kernforschungszentrum, Karlsruhe, GmbH
Institut für Neutronenphysik und Reaktortechnik (INR)
Federal Republic of Germany
- 1 P 4 - 6 THE EFFECT OF THE INITIAL GAS DENSITY AND GAS SHELL PROFILE
IN A SMALL GAS-PUFF Z-PINCH
C. Li, T. Yang, C. Luo, and M. Han
Tsinghua University, Beijing, China
- 1 P 4 - 7 PHOTOPUMPED XUV LASER STUDIES AT CORNELL
N. Qi, D.A. Hammer, D.H. Kalantar, G.D. Rondeau, K.C. Mittal,
J.P. Apruzese*, G.J. Bordonaro
Cornell University, Ithaca, NY
*Plasma Physics Division, Naval Research Laboratory
- 1 P 4 - 8 REFLECTION DUE TO FLUORESCENCE OF A RADIANT ENERGY FLUX
IMPINGING ON A PLANAR SURFACE
A. Bourdier, Centre d'Etudes de Limeil-Valenton, France
J.F. Desfond, Centre d'Etudes de Vaujours-Moronvilliers, France
J.J. Frey, Centre d'Etudes de Limeil-Valenton, France
- 1 P 4 - 9 HIGH-TEMPERATURE CAPILLARY-DISCHARGE X-RAY LASER DESIGN
R.C. Elton, J.D. Shipman, Jr.*, F.C. Young
Naval Research Laboratory, Washington, DC
*Sachs-Freeman Associates

Monday Afternoon, 21 May 1990

2:00 pm - Regency Ballroom

PSAC Prize Award Address

**"CYCLOTRON RESONANCE:
FROM E.O. LAWRENCE TO
MICROCHIPS**

**J. L. Shohet
University of Wisconsin**

Chairman: M.A. Sweeney

Monday Afternoon, 21 May 1990
2:50 pm -- Regency Ballroom G&H

Oral Session 2A
MAGNETIC FUSION DEVICE DESIGN
Chairman: J.G. Gilligan

- Invited**
- 2A-1&2 **ITER: PHYSICS BASICS**
B. Nevins for the ITER Team, Max-Planck-Institut fur
Plasmaphysik, Garching, BRD
- 2A-3 PRODUCTION OF A SELF-SUSTAINED FUSION REACTION IN THE
IGNITEX EXPERIMENT
IGNITEX Group, The University of Texas at Austin, Austin, TX
- 2A-4 TSC HALO DISRUPTION-INDUCED FORCES ON THE CIT VACUUM VESSEL
R.O. Sayer and Y-K.M. Peng,
Oak Ridge National Laboratory, Oak Ridge, TN
S.C. Jardin, Princeton Plasma Physics Laboratory
- 2A-5 PHYSICS ANALYSIS OF THE APOLLO D-³HE TOKAMAK REACTOR
J.F. Santarius, G.A. Emmert
University of Wisconsin, Madison, WI
- 2A-6 NEUTRON AND ALPHA DETECTION FOR A FUSION IGNITION EXPERIMENT
W.D. Booth, R. Carrera, B. Wehring
The University of Texas at Austin, Austin, TX
T. Parish, Texas A&M University, College Station, TX
T. Elevant, JET Joint Undertaking, Abingdon, Oxfordshire, U.K.
- 2A-7 OPERATION OF A 20 TESLA ON-AXIS TOKAMAK TOROIDAL FIELD MAGNET
M.D. Werst, G.W. Brunson, K.T. Hsieh, R.L. Sledge, W.F. Weldon
The University of Texas at Austin, Austin, TX
- Invited**
- 2A-8&9 **THE COMPACT IGNITION TOKAMAK (CIT)**
R.D. Stambaugh, G. Bateman*, M.G. Bell*, D. Cohn,**
P. Colestock*, G.H. Neilson***, M. Porkolab**,
J.A. Schmidt*, D.J. Sigmar**, M. Ulrickson*,
K.M. Young*, and CIT Project Team
General Atomics, San Diego, CA
*Princeton Plasma Physics Laboratory
**Massachusetts Institute of Technology
***Oak Ridge National Laboratory

Monday Afternoon, 21 May 1990
2:50 pm -- Room #203

Oral Session 2B
COMPUTERS IN PLASMA SCIENCE
Chairman: A.T. Drobot

- 2 B - 1 USING MATHEMATICA TO ASSIST PLASMA STABILITY ANALYSIS
 N.T. Gladd, Berkeley Research Assoc., Berkeley, CA
- 2 B - 2 NUMERICAL SIMULATION OF COLLISION-FREE
 PLASMA USING VLASOV HYBRID SIMULATIONS
 D. Nunn, Dept. of Electronics and Computer Science
 University of Southampton, United Kingdom
- 2 B - 3 IMPROVEMENTS IN THE IMPLICIT SIMULATION OF PLASMAS
 C. Bergman and R.J. Mason
 Los Alamos National Laboratory, NM
- 2 B - 4 ELBA - A LASER-PLASMA SIMULATION CODE
 G. Joyce, J. Krall, S. Slinker, P. Sprangle
 Naval Research Laboratory, Washington, DC
- 2 B - 5 & 6 **Invited**
 GENERAL ANALYSIS OF 3D ELECTROMAGNETIC FIELDS
 USING MSC/EMAS
 B.E. MacNeal, The MacNeal-Schwendler Corporation
 Los Angeles, CA
- 2 B - 7 NEW PIC METHODS ON UNSTRUCTURED MESHES APPLIED TO THE
 SIMULATION OF A PHOTOCATHODE INJECTOR
 A. Adolf, P. Degond, F. Hermeline, J. Marilleau,
 P. Raviart, J. Segre
 CEA - Limeil, Villeneuve, St. Georges, France
- 2 B - 8 BOUNDARY CONDITIONS FOR THE DARWIN MODEL OF APPROXIMATION
 TO MAXWELL'S EQUATION
 P. Degond and P.A. Raviart
 Centre de Mathematiques Appliquees, Ecole Polytechnique, France
 Commissariat a l'Energie Atomique, France

Monday Afternoon, 21 May 1990
2:50 pm -- Room #202

Oral Session 2C
MAGNETOHYDRODYNAMICS and
ELECTROMAGNETIC AND ELECTROTHERMAL LAUNCHERS
Chairmen: I. Alexeff and J.V. Parker

- 2C-1&2 Invited**
MAGNETOHYDRODYNAMICS FROM A BLACKSMITH'S
PERSPECTIVE
D.O. Hobson, Oak Ridge National Laboratory, Oak Ridge, TN
- 2C-3 AN ELECTRODELESS AC MHD GENERATOR AND PUMP**
I. Alexeff, J. Brickey, S. Mitchell
University of Tennessee, Knoxville, TN
- 2C-4 MULTIPLE, SIMULTANEOUS, COUPLED, ONE-DIMENSIONAL**
MHD CALCULATIONS FOR MODELING TWO-DIMENSIONAL,
COAXIAL FLUX-COMPRESSION GENERATORS
M.G. Sheppard, T.A. Oliphant, D.L. Weiss
Pulsed Energy Applications Group, X-10
B.L. Freeman, Shock Wave Physics, M-6
Los Alamos National Laboratory, Los Alamos, NM
- 2C-5 HEAVY METAL ELECTRODES DEVELOPMENT FOR COAL-FIRED**
MHD GENERATOR CHANNELS
T. Okuo, Electrotechnical Laboratory, Tsukuba, Japan
Y. Aoki, S. Yatsu, S. Oikawa, H. Kitagawa, N. Kayukawa,
B. Tuchida, R. Nishimura, M. Yagi, K. Yoshizaki
Hokkaido University, Sapporo, Japan
- 2C-6 EXPERIMENTS ON A SiC-CuG₁-Cu INSULATOR AND A**
CONSTRUCTION OF 5 MWt LONG DURATION MHD CHANNEL
Y. Aoki, S. Yatsu, S. Oikawa, H. Kitagawa, M. Yagi,
N. Kayukawa, B. Tuchida, R. Nishimura, K. Yoshizaki
Hokkaido University, Sapporo, Japan
T. Okuo, Electrotechnical Laboratory, Tsukuba, Japan
T. Ookouchi, Hitachi Ltd., Ibaraki, Japan
- 2C-7 A SIMPLIFIED TWO-ELECTRON GROUP MODEL THEORY FOR**
RADIOFREQUENCY IONIZATION OF HELIUM WITH TURBULENT FLOW
M.E. Talaat, University of Maryland, College, Park, MD
- 2C-8 SECONDARY ARC FORMATION AND EVOLUTION OF RAILGUNS**
D. Keefer, L.M. Smith, R. Rhodes
University of Tennessee Space Institute, Tullahoma, TN

- 2C-9 STUDIES OF MATERIAL SURFACE EROSION EXPOSED TO
 PLASMAS IN AN ELECTROTHERMAL LAUNCHER
 O.E. Hawkins, M.A. Bourham, J.G. Gilligan, S. Tallavarjula
 North Carolina State University, Raleigh, NC
- 2C-10 IMPLICATIONS OF RAIL ELECTRODYNAMICS
 G.E. Rolader and K.A. Jamison
 Science Applications International Corporation, Shalimar, FL

Monday Afternoon, 21 May 1990
2:50 pm -- Rooms #210-211

**Oral Session 2D
GAS DISCHARGES and
GASEOUS ELECTRONICS:
FUNDAMENTAL PROCESSES II
Chairman: G.L. Rogoff**

- Invited**
- 2 D - 1 & 2 **RF REFERENCE CELL FOR PLASMA ETCHING STUDIES**
P.J. Hargis, Jr., Sandia National Laboratory, Albuquerque, NM
- 2 D - 3 **DIAGNOSTICS AND MODELING OF RF DISCHARGE DISSOCIATION IN N₂O**
L.E. Kline, W.D. Partlow, R.M. Young, R.R. Mitchell, T.V. Congedo
Westinghouse STC, Pittsburgh, PA
- 2 D - 4 **CONSTRAINTS ON PARTICLE GROWTH IN PLASMAS**
A. Garscadden, Wright Research & Development Center
Wright Patterson Air Force Base, Ohio
- 2 D - 5 **TOLERANCE OF PULSED DISCHARGES TO CONTAMINATION BY
GAS PHASE PARTICULATES**
M.J. McCaughey and M.J. Kusher
University of Illinois, Champaign, IL
- 2 D - 6 **THE COLD CATHODE ARC MODEL IN MERCURY DISCHARGES**
Y.M. Li, W.W. Byszewski, A.B. Budinger
GTE Laboratories Inc., Waltham, MA
- 2 D - 7 **A COMPARISON OF EXPERIMENTAL DATA FOR ARCS AND A THEORY
OF ELECTRICAL DISCHARGES**
W.B. Maier II, A. Kadish, R.T. Robiscoe
Los Alamos National Laboratory, Los Alamos, NM
- 2 D - 8 **THE AFFECTION OF MAGNETIC FIELD ON THE AXIAL MOTION OF A
ROTATING ELECTRIC ARC**
B. Gu and C. Wu
Institute of Mechanics, Chinese Academy of Science

Monday Afternoon, 21 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 2P1
TOKAMAKS AND STELLARATORS and
REVERSE-FIELD PINCH

- 2 P 1 - 1 PLASMA STABILITY AND CONFINEMENT IN THE PBX-M TOKAMAK
N.R. Sauthoff and the PBX-M Team
Princeton University, Princeton, NJ
- 2 P 1 - 2 DESIGN OF MICROWAVE ELECTRIC FIELD DIAGNOSTICS (LAPPS)
IN MTX TOKAMAK PLASMA
K. Mizuno, J. Foote*, T. Oda**, K. Takiyama**, M. Shiho***,
K. Odajima***, K. Oasa***, and Y. Matsuda*
Plasma Physics Research Institute and UC D_e
*Lawrence Livermore National Laboratory
**Hiroshima University
***Japan Atomic Energy Research Institute
- 2 P 1 - 3 TOKAMAK DISRUPTION HEAT FLUX SIMULATOR
M. Langhoff, G. Hess, J. Gahl, R. Ingram
Univ. of New Mexico, Albuquerque, NM
- 2 P 1 - 4 PARTICLE SIMULATIONS OF TRANSPORT IN A HIGH-RECYCLING DIVERTOR
SCRAPE-OFF LAYER
R.J. Procassini and C.K. Birdsall, UC Berkeley, Berkeley, CA
B.I. Cohen, Lawrence Livermore National Lab, Livermore, CA
- 2 P 1 - 5 ISSUES FOR THE ELECTRIC UTILITIES POSED BY DT
TOKAMAK FUSION POWER PLANTS
J. Reece Roth, University of Tennessee, Knoxville, TN
- 2 P 1 - 6 SCATTERING FROM DENSITY AND MAGNETIC FLUCTUATIONS
IN A TOKAMAK
L. Vahala, Old Dominion University, Norfolk, VA
G. Vahala, William & Mary, Williamsburg, VA
D. Sigmar, MIT, Cambridge, MA
- 2 P 1 - 7 EFFECTS OF ELECTRON TEMPERATURE GRADIENT ON THE c/ω_{pe}
INSTABILITY IN TOKAMAKS
A. Hirose, Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada
- 2 P 1 - 8 PARAMETERIZATION OF DT IGNITION IN TIGHT ASPECT RATIO,
ELONGATED TOROIDAL PLASMA
L.E. Sugiyama, Massachusetts Institute of Technology
Cambridge, MA

- 2 P 1 - 9 ABSENCE OF TILT AND SHIFT MODES IN A REVERSED FIELD PINCH
WITH NO SHELL
P. Greene and S. Robertson, University of Colorado, Boulder, CO
- 2 P 1 - 1 0 2-D MHD MODELING OF A DIVERTOR FOR ZT-P
R. Maingi*+, K. Werley, J. Gilligan*
Los Alamos National Laboratory, Los Alamos, NM
*North Carolina State University, Raleigh, NC
+DOE Magnetic Fusion Energy Technology Fellow
- 2 P 1 - 1 1 STATUS OF THE CONFINEMENT PHYSICS RESEARCH FACILITY
(CPRF) CONSTRUCTION PROGRAM
P. Thullen, K.F. Schoenberg, J.N. DiMarco
Los Alamos National Laboratory, Los Alamos, NM
- 2 P 1 - 1 2 A DIGITAL, NYQUIST SOLVING, FEEDBACK CONTROL SYSTEM FOR ZTP
M.M. Pickrell, Los Alamos National Laboratory, Los Alamos, NM

Monday Afternoon, 21 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 2P2
PLASMA WAVES AND INSTABILITIES and
BASIC PLASMA PHENOMENA

- 2 P 2 - 1 DOUBLE LAYERS IN A PLASMA WITH NEGATIVE IONS
 R.L. Merlino, J.J. Loomis
 University of Iowa, Iowa City, IA
- 2 P 2 - 2 MAGNETIZED POTENTIAL STRUCTURES IN A LABORATORY PLASMA
 T. Intrator, J. Menard
 Dept. of Nuclear Engineering and Engineering Physics
 University of Wisconsin, Madison, WI
- 2 P 2 - 3 OBLIQUELY PROPAGATING ION ACOUSTIC DOUBLE LAYERS IN A
MULTICOMPONENT MAGNETIZED PLASMA
 L.L. Yadav and S.R. Sharma
 University of Rajasthan, Jaipur, India
- 2 P 2 - 4 SEARCH FOR RESONANCES IN ELECTRON-POSITRON SCATTERING USING A
COLD POSITRON GAS TARGET
 T.E. Cowan, R.H. Howell, R. Rohatgi
 Lawrence Livermore National Laboratory, Livermore, CA
 J. Fajans, U.C. Berkeley, Berkeley, CA
- 2 P 2 - 5 AN EXPERIMENTAL INVESTIGATION OF FAST-TIMESCALE PHENOMENA
ASSOCIATED WITH THE RAPID BIASING OF OBJECTS IN PLASMA
 D.M. Suszcynsky and J.E. Borovsky
 Los Alamos National Laboratory, Los Alamos, NM
- 2 P 2 - 6 ELECTROSTATIC-INTERTIAL PLASMA CONFINEMENT
 G.H. Miley, J.H. Nadler, Y.B. Gu, and O. Barnouin
 University of Illinois, Urbana, IL
- 2 P 2 - 7 EXPLOSIVE PLASMA FORMATION ON SURFACES CAUSED BY
UNIPOLAR ARCING
 F. Schwirzke
 Naval Postgraduate School, Monterey, CA
- 2 P 2 - 8 ON THE THERMODYNAMICS OF DIAMAGNETIC PLASMA EXPANSIONS
 G.R. Gisler and T.G. Onsager
 Los Alamos National Laboratory, Los Alamos, NM
- 2 P 2 - 9 AN EXAMINATION OF THE FIRST ADIABATIC INVARIANT FOR PARTICLES
IN TIME-DEPENDENT MAGNETIC FIELDS
 J.E. Borovsky, Los Alamos National Laboratory, NM
 P.J. Hansen, University of Iowa, Iowa City, IA

- 2 P 2 - 1 0 ION-ACOUSTIC SOLITARY WAVES IN RELATIVISTIC PLASMAS
H.H. Kuehl and C. Y. Zhang
University of Southern California, Los Angeles, CA
- 2 P 2 - 1 1 ION-ACOUSTIC CNOIDAL WAVE IN A WARM ION PLASMA
S.L. Jain, R.S. Tiwari, S.R. Sharma
Dept. of Physics, University of Rajasthan, Jaipur, India
- 2 P 2 - 1 2 ICRF FULL WAVE FIELD SOLUTIONS AND ABSORPTION FOR
D-³HE AND D-T SCENARIOS
R. Sund and J. Scharer
University of Wisconsin, Madison, WI
- 2 P 2 - 1 3 EFFECT OF SWITCHING A MAGNETOPLASMA MEDIUM ON A TRAVELLING
WAVE: CONSERVATION LAW FOR FREQUENCIES OF NEWLY
CREATED WAVES
D.K. Kalluri, University of Lowell, Lowell, MA
- 2 P 2 - 1 4 LONGITUDINAL PROPAGATION OF WAVES IN A SWITCHED
MAGNETOPLASMA MEDIUM: ECKERSLEY APPROXIMATION
S.R.V. Madala and D.K. Kalluri
University of Lowell, Lowell, MA
- 2 P 2 - 1 5 TRANSVERSE PROPAGATION OF LOW FREQUENCY WAVES IN A SWITCHED
MAGNETOPLASMA MEDIUM
S.R.V. Madala and D.K. Kalluri, University of Lowell, Lowell, MA
- 2 P 2 - 1 6 PHOTON ACCELERATION: THREE-WAVE INTERACTION
O. Ishihara, Texas Tech University, Lubbock, TX
- 2 P 2 - 1 7 UPPER HYBRID MODE CONVERSION AND RESONANCE EXCITATION OF
BERNSTEIN MODES IN IONOSPHERIC HEATING EXPERMENTS
N.N. Rao* and D.J. Kaup
Clarkson University, Potsdam, NY
*Physical Research Laboratory, Navrangpura, Ahmedabad, India

Monday Afternoon, 21 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 2P3
INTENSE BEAM MICROWAVE SOURCES

- 2 P3 -1 LONG PULSE RELATIVISTIC KLYSTRON OPERATION AT 1.3 GHZ
D.G. Rickel, M.V. Fazio, R.M. Stringfield, J. Farnham
Los Alamos National Laboratory, Los Alamos, NM
- 2 P3 -2 RELATIVISTIC KLYSTRON AMPLIFIER AND ITS APPLICATIONS
V. Serlin, M. Friedman, Y.Y. Lau, J. Krall
Naval Research Laboratory, Washington, DC
- 2 P3 -3 PHASE CONTROL OF CROSSED-FIELD DEVICES FOR
HPM POWER COMBINING
T.A. Treado, R.S. Smith III, G.E. Thomas, D.J. Jenkins,
J.A. Robertson, R.D. Pomeroy
Varian Beverly Microwave Division, Beverly, MA
R.A. Kehs, Harry Diamond Laboratory, Adelphi, MD
- 2 P3 -4 INITIAL TEST RESULTS FROM THE HDL-VARIAN INJECTION-LOCKED,
CONVENTIONAL EMISSION, HIGH POWER MAGNETRON PROGRAM
R.S. Smith III, T.A. Treado, G.E. Thomas, J.A. Robertson,
R.D. Pomeroy, J.D. Barry,
Varian Beverly Microwave Division, Beverly, MA
R. A. Kehs and A. Bromborsky
Harry Diamond Laboratory, Adelphi, MD
- 2 P3 -5 THEORY OF HIGH POWER CYLINDRICAL MAGNETRON
H.S. Uhm, H.C. Chen, R.A. Stark
Naval Surface Warfare Center, White Oak, Silver Spring, MD
H.E. Brandt, Harry Diamond Laboratories, Adelphi, MD
- 2 P3 -6 PHASE-LOCKING SIMULATION OF DUAL MAGNETRONS
H.C. Chen, R.A. Stark, H.S. Uhm
Naval Surface Warfare Center, White Oak, Silver Spring, MD
- 2 P3 -7 FREQUENCY STABILIZATION OF A VIRCATOR BY USE OF
A SLOW WAVE STRUCTURE
R.G. Madonna and P.J. Scheno
Grumman Corporate Research Center, Bethpage, NY

- 2 P 3 - 8 A 100 MW, 8.63 GHZ NARROW-BAND MICROWAVE PULSE FROM
THE RADIALLY EXTRACTED REFLEX TRIODE
C.S. Hwang, M.W. Wu, M.S. Yang, F.C. Lin, P.S. Song, W.S. Hou
Institute of Nuclear Energy Research, Lungtan, Taiwan, R.O.C.
- 2 P 3 - 9 A TM_{01} -MODE AXIAL VIRCATOR
M.W. Wu, C.Y. Chen, T.C. Guung, C.S. Hwang, P.S. Song, W.S. Hou
Institute of Nuclear Energy Research, Lungtan, Taiwan, R.O.C.
- 2 P 3 - 10 A TUNEABLE NARROW-BAND HIGH POWER VIRCATOR
C.S. Hwang, M.S. Yang, F.C. Lin, M.W. Wu, P.S. Song, W.S. Hou
Institute of Nuclear Energy Research, Lungtan, Taiwan, R.O.C.
- 2 P 3 - 11 RELATIVISTIC ELECTRON BEAM PROPAGATION AND EXPERIMENTAL
DESIGN FOR AN X-BAND BACKWARD-WAVE OSCILLATOR
E.T. Rosenbury, M. Rhodes, J.F. Camacho, B.R. Poole
Lawrence Livermore National Laboratory, Livermore, CA
- 2 P 3 - 12 MICROWAVE GENERATION RESULTS FROM AN X-BAND BACKWARD-
WAVE OSCILLATOR EXPERIMENT
J.F. Camacho, E.T. Rosenbury, B.R. Poole
Lawrence Livermore National Laboratory, Livermore, CA
- 2 P 3 - 13 THEORY AND MODELING OF AN X-BAND BACKWARD-WAVE OSCILLATOR
B.R. Poole, J.F. Camacho, E.T. Rosenbury
Lawrence Livermore National Laboratory, Livermore, CA
- 2 P 3 - 14 DESIGN STUDY OF A MULTIWAVE CERENKOV GENERATOR FOR
HIGH POWER MICROWAVE EMISSION
D.K. Abe, A. Bromborsky*, Y. Carmel, W.W. Destler,
V. L. Granatstein, and R.A. Kehs*
University of Maryland, College Park, MD
*Harry Diamond Laboratories, Adelphi, MD
- 2 P 3 - 15 NONLINEAR THEORY OF THE BACKWARD WAVE OSCILLATOR WITH
RELATIVISTIC ELECTRON BEAM
B. Levush and T. Antonsen, Jr.
University of Maryland, College Park, MD
- 2 P 3 - 16 X-BAND TANDEM OSCILLATOR-AMPLIFIER
C.B. Wharton, Cornell University, Ithaca, NY
- 2 P 3 - 17 ELECTRON BEAM GENERATION AND TRANSPORT IN A BACKWARD
WAVE OSCILLATOR EXPERIMENT
J. Bradley, G. McCarthy, J. Gahl, E. Schamiloglu
Dept. of Electrical and Computer Engineering,
University of New Mexico, Albuquerque, NM

- 2P3-18 HIGH POWER MICROWAVE EMISSION FROM CYCLOTRON MASER INTERACTIONS IN MICROSECOND, INTENSE ELECTRON BEAMS
R.M. Gilgenbach, J.J. Choi, T.A. Spencer
University of Michigan, Ann Arbor, MI
- 2P3-19 MICROWAVE MEASUREMENTS FROM A GYROTRON OPERATING WITH A NEUTRALIZING BACKGROUND PLASMA
D.A. Kirkpatrick*, S.H. Gold, A.C. Ting, W.M. Manheimer, A.K. Kinkead, D.L. Hardesty, K.W. Killian, and M. Sucky**
Naval Research Laboratory
*Science Applications International Corp., McLean, VA
**Jaycor Inc., Vienna, VA
- 2P3-20 MEGAVOLT GYRO-TRAVELING-WAVE AMPLIFIER EXPERIMENT AT 35 GHz
S.H. Gold, D.A. Kirkpatrick*, A.W. Flitflet, A.K. Kinkead, D.L. Hardesty, M. Sucky, Naval Research Laboratory, Wash., DC
*SAIC, McLean, VA
- 2P3-21 CO-AXIAL CONFIGURATION OF A DIELECTRIC CHERENKOV MASER
E. Garate and A. Fisher
U.C. Irvine, Irvine, CA
W. Main
University of Maryland, College Park, MD
- 2P3-22 OPERATION OF AN X-BAND DIELECTRIC CHERENKOV MASER AMPLIFIER
W. Main, J. Weatherall, and R. Cherry
General Dynamics Pomona Division, Pomona, CA
E. Garate, H. Kosai, W. Peter, and A. Fisher
University of California at Irvine, Irvine, CA
- 2P3-23 LINEAR STABILITY OF A HIGH CURRENT, RELATIVISTIC, CHARGED PARTICLE BEAM DRIFTING IN A RESONANT CAVITY
R.W. Lemke, Sandia National Laboratory, Albuquerque, NM
- 2P3-24 ANALYSIS OF TRANSIT-TIME OSCILLATOR DEVICES IN THE SLOWLY-VARYING AMPLITUDE APPROXIMATION
T.C. Genoni, Mission Research Corporation, Albuquerque, NM
- 2P3-25 3-D RADIAL LOADING OF CYLINDRICAL CAVITIES WITH MULTIPLE RECTANGULAR WAVEGUIDE
J.H. Havey, Mission Research Corporation, Albuquerque, NM
- 2P3-26 EXPERIMENTAL REALIZATION OF A TRANSVERTON OSCILLATOR FOR HIGH POWER MICROWAVES
C. Wood, G. Hutcheson, D. Sullivan, M. Arman, J. Havey
Mission Research Corporation, Albuquerque, NM

- 2 P 3 - 27 HYBRID FINITE-BOUNDARY ELEMENT ANALYSIS OF MICROWAVE
ANTENNAS FOR HIGH POWER APPLICATIONS
P.K. Shin, S.J. Salon, K.A. Connor
Rensselaer Polytechnic Institute, Troy, NY
- 2 P 3 - 28 MEASUREMENTS OF RF WAVE-ELECTRON INTERACTIONS IN A
LOW FREQUENCY (150 MHz) CROSSED-FIELD AMPLIFIER
J. Browning, C. Chan, J. Ye
Center for Electromagnetics Research
Northeastern University, Boston, MA

Tuesday Morning, 22 May 1990

8:30 am - Regency Ballroom

***"PHYSICS AND APPLICATIONS OF
ADVANCED PULSED POWER
ACCELERATORS AND PARTICLE
BEAMS"***

***Dr. Pace VanDevender
Sandia National Laboratory***

Chairman: M. Krishnan

Tuesday Morning, 22 May 1990
9:40 am -- Regency Ballroom G&H

Oral Session 3A
INTENSE BEAM MICROWAVE SOURCES - I
Chairman: S. H. Gold

- 3A-1&2 **Invited**
CHARACTERISTICS OF A HIGH EFFICIENCY, HIGH POWER
X BAND TWT AMPLIFIER
J.A. Nation, D. Shiffler, G. Kerslick, L. Schacter
Cornell University, Ithaca, NY
- 3A-3 EXPERIMENTAL STUDIES OF HIGH POWER PLASMA FILLED
BACKWARD WAVE OSCILLATORS
Y. Carmel, W.R. Lou, W.W. Destler, V.L. Granatstein, J. Rodgers,
R.A. Kehs, K. Minami
University of Maryland, College Park, MD
- 3A-4 ABSOLUTE INSTABILITY FOR ENHANCED RADIATION FROM A HIGH-POWER
PLASMA FILLED BACKWARD WAVE OSCILLATOR
K. Minami, M.M. Ali, K. Ogura, T. Hosokawa, H. Kazama, T. Ozawa
Niigata University, Japan
T. Watanabe
Institute for Fusion Science, Japan
V.L. Granatstein, W.W. Destler, R.A. Kehs, Y. Carmel,
W.R. Lou, D. Abe, University of Maryland, College Park, MD, USA
- 3A-5 THE EMISSION OF PLASMA CYCLOTRON WAVES IN PLASMA-FILLED
BACKWARD WAVE OSCILLATORS
A.T. Lin, University of California at Los Angeles, Los Angeles, CA
- 3A-6&7 **Invited**
PROGRESS IN RELATIVISTIC KLYSTRON RESEARCH
A.E. Vlieks, Stanford Linear Accelerator Center, Stanford, CA
- 3A-8 NONLINEAR BEAM LOADING AND DYNAMICAL LIMITING CURRENTS
IN A HIGH POWER MICROWAVE GAP
D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall, V. Serlin
Naval Research Laboratory, Washington, DC
- 3A-9 A MASTER-OSCILLATOR-DRIVEN PHASE-LOCKED VIRCATOR ARRAY
H. Sze, D. Price, B. Harteneck, N. Cooksey
Physics International Company, San Leandro, CA 94577
- 3A-10 COMPUTER SIMULATION OF VIRTUAL CATHODE OSCILLATIONS
T.-L. Lang, W.-T. Chen, W.-J. Liou, Y. Hu
National Tsing-Hua University, Taiwan, R.O.C.

Tuesday Morning, 22 May 1990
9:40 am -- Rooms #210-211

Oral Session 3B
INTENSE ELECTRON AND ION BEAMS - I
Chairman: S. Humphries, Jr.

- 3B-1&2 **Invited**
HIGH-CURRENT ION-BEAM DIAGNOSTICS
F.C. Young, Naval Research Laboratory, Washington, DC
- 3B-3 EXTRACTION APPLIED-B ION DIODE EXPERIMENTS ON HELIA
M.E. Cuneo, D.L. Hanson, P.F. McKay, R.S. Coats, W.G. Adams,
C.W. Heath, W.F. Stearns, J.R. Chavez
Sandia National Laboratories, Albuquerque, NM
- 3B-4 LOW MASS WALL-CONFINED DISCHARGE FOR LIGHT ION
BEAM TRANSPORT
D.D. Hinshelwood*, P.J. Goodrich*, J. Neri, W.F. Oliphant,
S.J. Stephanakis, J.J. Atrous, F.C. Young
Naval Research Laboratory, Washington, DC
*Jaycor, Vienna, VA
- 3B-5&6 **Invited**
PBFA II APPLIED B ION DIODE BEAM CHARACTERISTICS
AT HIGH VOLTAGES
D.J. Johnson, Sandia National Laboratories, Albuquerque, NM
- 3B-7 EXPERIMENTAL INVESTIGATIONS OF WIRE-GUIDED TRANSPORT FOR
LIGHT-ION-BEAM ICF
J.M. Neri, P.J. Goodrich*, D. Mosher, W.F. Oliphant,
P.F. Ottinger, S.J. Stephanakis, J.J. Watrous*, F.C. Young
Naval Research Laboratory, Washington, DC
*Jaycor, Vienna, VA
- 3B-8 BOLVAPS/LIBORS LITHIUM SOURCE EXPERIMENTS ON PBFA-II
T.J. Renk, P.L. Dreike, G.C. Tisone, G. Chandler, R.R. Johnston,
K.P. Lamppa, B.F. Clark
Sandia National Laboratories, Albuquerque, NM
- 3B-9 ANALYSIS OF NRL WIRE-GUIDED ION BEAM TRANSPORT EXPERIMENTS
J. Watrous*, P.J. Goodrich*, D. Mosher, J.M. Neri, P.F. Ottinger,
V.C. Scherrer, S.J. Stephanakis, F.C. Young
Naval Research Laboratory, Washington, DC
*Jaycor, Vienna, VA

Wednesday Morning, 23 May 1990
9:40 am -- Room #202

Oral Session 3C
FAST OPENING SWITCHES - I
Chairman: J. Goyer

- 3C-1 RECENT DEVELOPMENTS IN PEOS THEORY
J.M. Grossmann, P.F. Ottinger, R.J. Mason
Naval Research Laboratory, Washington, DC
- 3C-2&3 **Invited**
OPERATION AND EMPIRICAL MODELING OF THE PLASMA OPENING SWITCH
W. Rix, J. Thompson, D. Parks, E. Waisman
Maxwell Laboratories, Inc., San Diego, CA
- 3C-4 C⁺ AND C²⁺ OPTIMIZED PLASMA OPENING SWITCH FOR INDUCTIVE STORAGE
L. Veron, C. Rouille, B. Etlicher, B. Dufour, J.-M. Buzzi
Laboratoire de Physique des Milieux Ionises,
Laboratoire du CNRS, Ecole Polytechnique, Palaiseau France
R. Boivinet, Commissariat a l'Energie Atomique,
Centre d'Etudes de Moronvilliers, Bazancourt, France
- 3C-5&6 **Invited**
INVESTIGATION OF MICROSECOND PLASMA OPENING SWITCH
V.B. An, P.S. Anan'in, V.M. Bystritskii*, V.B. Karpov,
Ya.E. Krasik, I.V. Lisitsyn*, G.A. Mesyats*, A.A. Sinebrjukhov*,
Yu.P. Usov
Institute of Nuclear Physics, Tomsk, USSR
*Institute of Electrophysics, Sverdlovsk, USSR
- 3C-7 CALCULATED MAGNETIC FIELD ADVECTION IN PLASMA OPENING SWITCHES
D.C. Wilson, R.J. Mason, M.E. Jones, C. Bergman
Los Alamos National Laboratories, Los Alamos, NM
J.M. Grossmann and P.F. Ottinger
Naval Research Laboratory, Washington, DC
- 3C-8 EXPERIMENTS WITH PLASMA OPENING SWITCH ON SNOP-3 GENERATOR
V.M. Bystritskii, Yu.A. Glushko, G.A. Mesyats, Ya.E. Krasik**,
V.K. Petin*, N.A. Ratakhin*, A.A. Sinebrjukhov
Institute of Electrophysics, Sverdlovsk, USSR
*Institute of High Current Electronics, Tomsk, USSR
**Institute of Nuclear Physics, Tomsk, USSR
- 3C-9 THE SECOND PLASMA OPENING SWITCH STAGE ON THE GIT-4 GENERATOR
A.N. Bastrikov, S.P. Bugaev, A.M. Volkov, A.A. Kim,
B.M. Koval'chuk, V.A. Kokshenev, G.A. Mesyats*, F.I. Fursov,
V.P. Yakovlev, S.Yu. Sokovnin*
Institute of High Current Electronics, Tomsk USSR
Institute of Electrophysics, Sverdlovsk, USSR

Tuesday Morning, 22 May 1990
9:40 am -- Room #203

Oral Session 3D
X-RAY LASERS
Chairman: R.C. Elton

- 3D-1&2 **Invited**
SODIUM-NEON RESONANT PHOTOEXCITATION SOFT
X-RAY LASER EXPERIMENTS ON SATURN
J.L. Porter, R.B. Spielman, M.K. Matzen,
E.J. McGuire, T.W. Hussey
Sandia National Laboratories, Albuquerque, NM
C. Deeney, R.R. Prasad, T. Nash
Physics International Company, San Leandro, CA
- 3D-3 CALCULATION OF PHOTOIONIZATION AND PHOTOEXCITATION OF NEON
BY X-RAYS FROM A SODIUM-BEARING Z-PINCH IMPODED ON SATURN
J.P. Apruzese, R.W. Clark, J. Davis
Naval Research Laboratory, Washington, DC
- 3D-4 SODIUM WIRE ARRAY Z-PINCHES AS THE FLASHLAMP IN THE
NaX-NeIX X-RAY LASER SCHEME
C. Deeney, T. Nash, R.R. Prasad, M. Krishnan*
Physics International Company, San Leandro, CA
*Science Research Laboratory, Alameda, CA
F.C. Young, D.D. Hinshelwood, J.P. Apruzese
Naval Research Laboratory, Washington, DC
- 3D-5 IMPLOSION OF NaF PLASMA WITH A 3-MA DRIVER FOR A
Na/Ne PHOTOPUMPED LASER
F.C. Young and D.D. Hinshelwood
Naval Research Laboratory, Washington, DC
- 3D-6 ANALYSIS OF A POSSIBLE LASER AT 230 Å IN Be-LIKE MgIX,
RESONANTLY PHOTO-EXCITED BY THE 48.338Å LINE OF ALXI
M. Krishnan, Science Research Laboratory, Alameda, CA
J.P. Apruzese, Naval Research Laboratory, Washington, DC
T. Nash, C. Deeney, R.R. Prasad
Physics International Company, San Leandro, CA
- 3D-7 REFLECTION DUE TO FLUORESCENCE OF A RADIANT ENERGY FLUX
IMPINGING ON A PLANAR SURFACE
A. Bourdier, Centre d'Etudes de Limeil-Valenton, France
J.F. Desfond, Centre d'Etudes de Vaujours-Moronvilliers, France
J.J. Frey, Centre d'Etudes de Limeil-Valenton, France

Tuesday Morning, 22 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session 3P1
MICROWAVE-PLASMA INTERACTIONS

- 3 P 1 - 1 BROADBAND PLASMA ABSORBER
R.J. Vidmar, SRI International, Menlo Park, CA
- 3 P 1 - 2 ANOMALOUS ABSORPTION OF ELECTROMAGNETIC RADIATION
H.L. Rowland, Naval Research Laboratory, Washington, DC
- 3 P 1 - 3 EXPERIMENTAL STUDIES OF MICROWAVE INTERACTION WITH A
PLASMA-COVERED PLANAR CONDUCTING SURFACE
W.W. Destler, J. Rodgers, J.E. DeGrange, and Z. Segalov
University of Maryland, College Park, MD
- 3 P 1 - 4 MICROWAVE INTERACTIONS WITH A MAGNETIZED PLASMA NEAR THE
ELECTRON CYCLOTRON FREQUENCY
L.H. Combs, C. Liu, J.R. Roth
University of Tennessee, Knoxville, TN
- 3 P 1 - 5 EXPERIMENTS AND ANALYSIS OF WAVE ABSORPTION, REFLECTION AND
SCATTERING IN PLASMAS
J.E. Scharer, O.C. Eldridge, M.H. Bettenhausen, N.T. Lam,
S.W. Lam, University of Wisconsin, Madison, WI
- 3 P 1 - 6 ON THE FEASIBILITY OF MICROWAVE PRODUCED BRAGG REFLECTOR FOR
THE OTH RADAR APPLICATION
S.P. Kuo and Y.S. Zhang, Polytechnic University,
Weber Research Institute, Farmingdale, NY
- 3 P 1 - 7 A PLASMA-BASED SOURCE OF PULSED MICROWAVE AND MILLIMETER
WAVELENGTH RADIATION
R. Liou, H. Figueroa, G. Kirkman-Amemiya**, R.J. Temkin*,
A.H. McCurdy, H. Fetterman***, M.A. Gunderson
University of Southern California
*MIT
**Integrated Applied Physics
***UCLA
- 3 P 1 - 8 FURTHER DEVELOPMENT OF THE DOUBLE CAVITY MICROWAVE PULSE
COMPRESSION SOURCE AND LASER-INDUCED PLASMA SWITCHING
P.R. Bolton, R.A. Alvarez D.N. Fittinghoff
Univ. of Calif., Lawrence Livermore National Lab, Livermore, CA

- 3 P 1 - 9 CALCULATION OF FINITE-TIME ECRH POWER ABSORPTION
USING THE METHOD OF CHARACTERISTICS
J.H. Booske, ECE Dept. U. Wisconsin, Madison, WI
K. Junck and W.D. Getty, U. Michigan, Ann Arbor, MI
P.N. Guzdar, University of Maryland, College Park, MD
- 3 P 1 - 1 0 ANALYSIS OF SINGLE PASS ECH PROPAGATION AND ABSORPTION
EXPERIMENTS IN MTX
M.E. Fenstermacher, S.L. Allen, J.A. Byers, T.A. Casper,
R.H. Cohen, J.H. Foote, E.B. Hooper, M.A. Makowski,
W.H. Meyer, J.M. Koller, K. Oasa,* T. Ogawa,* B.W. Rice,
T.D. Rognlien, G.R. Smith, B.W. Stallard, K.I. Thomassen,
R.D. Wood, Lawrence Livermore National Lab, Livermore, CA
*Japan Atomic Energy Research Institute
- 3 P 1 - 1 1 MTX TRANSPORT SYSTEM FOR 140 GHz, 0.4 MW CW GYROTRON
M.A. Makowski, TRW Inc., Redondo Beach, CA
B.W. Stallard, Lawrence Livermore Laboratory, Livermore, CA

Tuesday Morning, 22 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Sesseion 3P2
SPACE PLASMA DIAGNOSTIC TECHNIQUES

- 3 P 2 - 1 LABORATORY STUDY OF THE TEMPORAL EVOLUTION OF THE
NEAR WAKE OF A CONDUCTING BODY WITH ENHANCED
SECONDARY ELECTRON EMISSION
S. Meassick, C. Chan, T. Azar, G. Scarmoutzos, T. Stroda
Northeastern University, Boston, MA
- 3 P 2 - 2 SHEATH STRUCTURE NEAR A PROBE IN A FLOWING PLASMA
N. Singh and B. Vashi
Dept. of Electrical and Computer Engineering & CSPAR,
University of Alabama in Huntsville, Huntsville, AL
- 3 P 2 - 3 SUB-STORMS - MODEL PREDICTIONS AND OBSERVATIONS
M.B. Silevitch¹, P.L. Rothwell², L.P. Block³,
C.G. Falthammer³
¹Center for Electromagnetics Research
Northeastern University, Boston, MA
²Hanscom AFB, Bedford, MA
³Royal Institute of Technology, Stockholm, Sweden
- 3 P 2 - 4 SEEDING OF AMBIENT ELECTRONS IN CRITICAL VELOCITY IONIZATION
S.T. Lai and E. Murad
Geophysics Laboratory, Hanscom AFB, MA
W.J. McNeil, Radex Inc, Bedford, MA
- 3 P 2 - 5 HIGH T_c SUPERCONDUCTING ANTENNA PRODUCED BY SPUTTERING
T. Ohnuma, T. Kuroko, H. Tomi
Tohoku University, Sendai, Japan
- 3 P 2 - 6 CONTROLLED RADIATION FIELDS FROM PARTICLE BEAM ANTENNA
T. Ohnuma and M. Shimegi
Tohoku University, Sendai, Japan

Tuesday Morning, 22 May 1990
9:40 am -- Calvin Simmons Ballroom

**Poster Session 3P3
ELECTRON, ION, AND PLASMA SOURCES**

- 3 P 3 - 1 LIQUID-ANODE LITHIUM ION-SOURCE EXPERIMENTS ON PBFA II
J.R. Woodworth, A.L. Pregonzer, R.G. Adams, T.R. Lockner,
R.A. Gerber, D. J. Johnson, W.H. Jaramillo, M.M. Dillon,
R.S. Coats, Sandia National Laboratories, Albuquerque, NM
M. Halliburton, P. Primm, G. Torres, G. Ziska, T. Atwood
K-Tech Corporation, Albuquerque, NM
- 3 P 3 - 2 THEORY OF EHD ION SOURCES ON PBFA II
A.L. Pregonzer and S. E. Rosenthal
Sandia National Laboratories, Albuquerque, NM
- 3 P 3 - 3 MAGNETICALLY-CONTROLLED GAS BREAKDOWN ANODE PLASMA
SOURCES FOR MAGNETICALLY-INSULATED ION DIODES
J.B. Greenly, A. Dunning, K.C. Mittal, G.D. Rondeau
Cornell University, Ithaca, NY
- 3 P 3 - 4 CARBON⁴⁺ PLASMA SOURCE
C.W. Mendel, Jr., M.E. Savage, D.M. Zagar, W.W. Simpson
Sandia National Laboratories, Albuquerque, NM
- 3 P 3 - 5 FLASHBOARD PLASMA CHARACTERIZATION BY OPTICAL DIAGNOSTICS
A.B. Baranga, N. Qi, D.A. Hammer
Cornell University, Ithaca, NY
- 3 P 3 - 6 COMPOSITION OF A SURFACE FLASHOVER PLASMA
D.E. Buraczyk and K.W. Zieher
Texas Tech University, Lubbock, TX
- 3 P 3 - 7 LONG PULSE ELECTRON BEAM EXTRACTION FROM A PLASMA
EDGE CATHODE
M.G. Grothaus and K.W. Zieher
Texas Tech Univeristy, Lubbock, TX
- 3 P 3 - 8 NUMERICAL MODELING OF THE LBL HIF ION SOURCE
D.W. Hewett, Lawrence Livermore Laboratory, Livermore, CA
H.L. Rutkowski, Lawrence Berkeley Laboratory, Berkeley, CA

- 3 P 3 - 9 LOW ENERGY METAL ION BEAM SOURCE
 X. Godechot* and I.G. Brown
 Lawrence Berkeley Laboratory, Berkeley, CA
 *On leave to Lawrence Berkeley Laboratory from
 SODERN, Limeil-Brevannes, France
- 3 P 3 - 10 DEVELOPMENT OF AN RF PLASMA SOURCE USING HELICON WAVES
 FOR THE STUDY OF PLASMA-MATERIAL INTERACTIONS IN FUSION
 MACHINES
 Y. Ra, L. Schmitz, P. Chia, R.W. Conn
 University of California at Los Angeles, Los Angeles, CA
- 3 P 3 - 11 CHARACTERISTICS OF AN ELECTRON CYCLOTRON RESONANCE MULTICUSP
 PLASMA SOURCE
 C.C. Tsai, L.A. Berry, H.H. Haselton, D.E. Schechter
 Oak Ridge National Laboratory, Oak Ridge, TN
- 3 P 3 - 12 PLASMA INSTABILITY IN ECR HEATED ION SOURCES
 Y.-K. Pu and W. Halverson
 Spire Corporation, Bedford, MA
- 3 P 3 - 13 A MICROWAVE GENERATED PLASMA FOR ION IMPLANTATION STUDIES
 P.F. Keebler and J.R. Roth
 University of Tennessee, Knoxville, TN
- 3 P 3 - 14 FAST MAGNETIZATION OF A LOW TO HIGH BETA PLASMA BEAM
 F.J. Wessel, J.H. Song, N. Rostoker
 University of California at Irvine, Irvine, CA
 G. Yur and H.U. Rahman
 IGPP, University of California at Riverside
- 3 P 3 - 15 PRELIMINARY CONSIDERATIONS AND EXPERIMENTS TO OBTAIN HIGHER
 BRIGHTNESS OF PULSED ION BEAMS WITH BUNCH
 K. Kasuya, K. Horioka, Y. Saito, T. Aso, H. Iida, N. Matsuura,
 Y. Goino* and S. Kato*
 Tokyo Institute of Technology, The Graduate School at Nagatsuta,
 Yokohama, Kanagawa, Japan
 *Nissin Electric Co., Ltd., Kyoto, Japan
- 3 P 3 - 16 PHASE SPACE MEASUREMENTS BY A FINITE-WIDTH SLIT
 M.J. Rhee and K.K. Jain
 University of Maryland, College Park, MD
 R.F. Schneider, Naval Surface Warfare Center, Silver Spring, MD
- 3 P 3 - 17 INVESTIGATION OF REPETITIVE HIGH QUALITY ELECTRON BEAM
 FROM A PSEUDOSPARK
 K.K. Jain and M.J. Rhee
 University of Maryland, College Park, MD

Tuesday Morning, 22 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 3P4
COMPACT TOROID PLASMAS AND
ALTERNATE FUSION CONCEPTS

- 3 P 4 - 1 MODEL FOR FORMATION OF FIELD-REVERSED CONFIGURATIONS
IN THETA PINCH
L. Steinhauer, Spectra Technology, Inc. Bellevue, WA
- 3 P 4 - 2 TRANSPORT IN A STEADY-STATE RIGID-ROTOR FRC
A. Kuthi, H. Zwi, A.Y. Wong, UCLA, Los Angeles, CA
- 3 P 4 - 3 PROGRESS IN SPHEROMAKS FOR POWER AMPLIFICATION AND
TRANSFER TO HYPERVELOCITY PROJECTILES
J.C. Fernandez, I. Henins, R.M. Mayo, F.J. Wysocki, G.J. Marklin
Los Alamos National Laboratory, Los Alamos, NM
- 3 P 4 - 4 PROGRESS WITH SMALL, HIGH-MAGNETIC-FIELD SPHEROMAKS IN CTX
F.J. Wysocki, J.C. Fernandez, I. Henins, T.R. Jarboe*,
G.J. Marlin, R.M. Mayo
Los Alamos National Laboratory, Los Alamos, NM
*University of Washington, Seattle, WA
- 3 P 4 - 5 IMPLICATIONS OF THE EDGE HELICITY DISSIPATION MODEL AS
APPLIED TO SPHEROMAKS
R.M. Mayo, F.J. Wysocki, J.C. Fernandez
Los Alamos National Laboratory, Los Alamos, NM
- 3 P 4 - 6 FORMATION AND ACCELERATION OF PRECOMPRESSED
COMPACT TORI IN RACE
A.W. Molvik, J.L. Eddleman, J.H. Hammer,
C.W. Harman, H.S. McLean*
Lawrence Livermore National Laboratory, Livermore, CA
*University of California at Berkeley, Berkeley, CA
- 3 P 4 - 7 DYNAMICS OF ACCELERATED COMPACT TOROIDAL PLASMAS
H.S. McLean, J.L. Eddleman, J.H. Hammer, C.W. Hartman,
A.W. Molvik, Lawrence Livermore National Lab., Livermore, CA
- 3 P 4 - 8 NUMERICAL MODELING OF ACCELERATED PRE-COMPRESSED
CTs IN RACE
J.L. Eddleman, J.H. Hammer, C.W. Hartman, B.G. Logan,
H.S. McLean, A.W. Molvik
Lawrence Livermore National Laboratory, Livermore, CA

- 3 P 4 - 9 AN ALTERNATIVE GEOMETRY FOR THE ACCELERATION OF
COMPACT TOROIDS
J.C. Thomas, D.Q. Hwang, J.H. Rogers
University of California at Davis, Davis, CA and
Lawrence Livermore National Laboratory, Livermore, CA
- 3 P 4 - 10 COMPACT TOROID FORMATION EXPERIMENTS
J.H. Degnan, G.P. Baca, J.D. Beason, M.E. Dearborn, D. Dietz,
K.E. Hackett, J.L. Holms, B.W. Mullins, J.L. Mullins, E.L. Ruden,
D.W. Price, C.R. Sovinec
Weapons Laboratory, Kirtland AFB, New Mexico
D. Gale, J.D. Graham, D. Ralph, M. Scott, W. Sommars
Maxwell Laboratories, Inc., Albuquerque, NM
G. Bird, S.K. Coffey, S.W. Seiler
R&D Associates, Alexandria, VA
G.F. Kiuttu, R.E. Peterkin, N.F. Roderick
Mission Research Corporation, Albuquerque, NM
P. Turchi, Ohio State University, Columbus, OH
- 3 P 4 - 11 MAGNETIC PROBE OF MEASUREMENTS OF COMPACT TOROID
FORMATION EXPERIMENTS
S.W. Seiler and S. Coffey
R&D Associates, Alexandria, VA
D.W. Price, J.H. Degnan, J.L. Holmes
Weapons Laboratory, Kirtland AFB, NM
- 3 P 4 - 12 OPTICAL SPECTROSCOPIC ANALYSIS OF COMPACT TOROIDS
G.F. Kiuttu, Mission Research Corporation, Albuquerque, NM
D.W. Price, Weapons Laboratory/Air Force Systems
Command, Kirtland AFB, NM
- 3 P 4 - 13 INTERFEROMETRY ON THE WEAPONS LABORATORY'S COMPACT
TOROID EXPERIMENT
E. Ruden and B. Mullins, Weapons Laboratory, Kirtland AFB, NM
- 3 P 4 - 14 PHASE 1B MARAUDER COMPUTER SIMULATIONS--
FORMATION OF PLASMA TORUS
C.R. Sovinec, Weapons Laboratory/AWX
Kirtland AFB, Albuquerque, NM
R.E. Peterkin, Jr.
Mission Research Corporation, Albuquerque, NM
- 3 P 4 - 15 COMPUTER SIMULATIONS OF COMPACT TOROID FORMATION
AND ACCELERATION
R.E. Peterkin, Jr., Mission Research Corporation, Albq., NM
C.R. Sovinec, Weapons Laboratory/AWX,
Kirtland AFB, Albuquerque, NM

- 3 P 4 - 1 6 STAGING FLUID FORMATION CALCULATIONS
D. Dietz, J.H. Degnan, J.D. Beason
Weapons Laboratory, Kirtland AFB, NM
P. Turchi, Ohio State University, Columbus, OH
- 3 P 4 - 1 7 COMPUTER SIMULATIONS OF CYLINDRICAL CURRENT DISCHARGE
DRIVEN SPHERICAL IMPLOSIONS
J.D. Beason, D. Dietz, and J.H. Degnan
Weapons Laboratory, Kirtland AFB, NM
M.L. Alme, R&D Associates, Alexandria, VA
P.J. Turchi, Ohio State University
- 3 P 4 - 1 8 HALL EFFECT MAGNETO HYDRO DYNAMICS AND APPLICATIONS
E.A. Witalis
Swedish Defence Research Establishment, Stockholm, Sweden

Tuesday Afternoon, 22 May 1990

2:00 pm - Regency Ballroom

The History of Plasma Science Address

***"HISTORY OF THE
FREE ELECTRON LASER"***

***Mr. R. M. Phillips
M-Square Microtek, Inc.***

Chairman: J.N. Benford

Tuesday Afternoon, 22 May 1990
2:50 pm -- Room #203

Oral Session 4A
MICROWAVE-PLASMA INTERACTIONS
Chairman: I. Alexeff

- 4 A - 1 EXPERIMENTAL STUDIES OF PLASMA EFFECTS ON MICROWAVE SIGNALS
R.J. Barker, Air Force Office of Scientific Research,
Bolling Air Force Base, Washington, DC
- 4 A - 2 THE DIMEX EXPERIMENT: RESULTS AND ANALYSIS
J.E. Brandenburg, W.M. Bollen, R. Seeley, D. Felinczak
Mission Research Corporation, Newington, VA
- 4 A - 3 ELECTROMAGNETIC-WAVE ABSORPTION BY INHOMOGENEOUS,
COLLISIONAL PLASMAS
D.J. Gregoire, J. Santoru, R.W. Schumacher
Hughes Research Labs, Malibu, CA
- 4 A - 4 ELECTROMAGNETIC-WAVE ABSORPTION IN A PLASMA-LOADED
RECTANGULAR WAVEGUIDE
J. Santoru, D.J. Gregoire, R.W. Schumacher
Hughes Research Labs, Malibu, CA
- 4 A - 5 PLASMA-INDUCED FREQUENCY SHIFTS IN MICROWAVE BEAMS
M. Rader, F. Dyer, A. Matas, I. Alexeff
University of Tennessee, Knoxville, TN
- 4 A - 6 FREQUENCY UP-CONVERSION OF MICROWAVE PULSE IN A RAPIDLY
GROWING PLASMA
S.P. Kuo, Y.S. Zhang, A.Q. Ren, Polytechnic University,
Weber Research Institute, Farmingdale, NY
- 4 A - 7 BROADBAND ATTENUATION OF MICROWAVE BY HOLLOW
CATHODE DISCHARGE PLASMA
S.P. Kuo and A.Y. Ho
Polytechnic Univ., Weber Research Institute, Farmingdale, NY
- 4 A - 8 TWO-DIMENSIONAL CALCULATION OF NONSEQUENTIAL ELECTRON LAYER
GENERATION BY CROSSED MICROWAVE BEAMS IN LOW-PRESSURE AIR
D.J. Mayhall, J.H. Yee, G.E. Sieger, and R.A. Alvarez
Lawrence Livermore National Laboratory, Livermore, CA
- 4 A - 9 SIMULATION OF INTENSE MICROWAVE PULSE PROPAGATION IN AIR
BREAKDOWN ENVIRONMENT
Y.S. Zhang and S.P. Kuo, Polytechnic University,
Weber Research Institute, Farmingdale, NY

4 A - 1 0

FIELD EXPERIMENTS AN LABORATORY STUDY OF PLASMA TURBULENCE
AND EFFECTS ON EM WAVE PROPAGATION

M.C. Lee, Plasma Fusion Center, MIT, Cambridge, MA

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

Tuesday Afternoon, 22 May 1990
2:50 pm -- Rooms #210-211

Oral Session 4B
INTENSE ELECTRON AND ION BEAMS - II
Chairman: S. Humphries, Jr.

- 4B-1&2 Invited**
LONG PULSE, LONG RANGE PROPAGATION
J.R. Smith¹, R.J. Lipinski, E. Schamiloglu², I.R. Shokair,
K.W. Struve³, P.W. Werner⁴
Sandia National Laboratories, Albuquerque, NM
¹Titan/Spectron
²University of New Mexico
³Mission Research Corporation
⁴U.S. Navy
- 4B-3 GAS CELL TRANSPORT OF 10 MA RELATIVISTIC ELECTRON BEAM**
V.J. Harper-Slaboszewicz, D.R. Welch*, J.R. Lee, W.A. Stygar,
W.E. Fowler, Sandia National Laboratory, Albuquerque, NM
*Mission Research Corp., Albuquerque, NM
- 4B-4 INJECTION AND TRANSPORT STUDIES ON THE UNM CUSP ARRAY**
TRANSPORT EXPERIMENT
S. Humphries, Jr., University of New Mexico, Albuquerque, NM
- 4B-5&6 Invited**
REB PROPAGATION EXPERIMENTS IN NEUTRAL GAS
R.A. Meger, J.A. Antoniadis*, D.P. Murphy, M.C. Myers,
R.E. Pechacek, T.A. Peyser**
Naval Research Laboratory, Washington, DC
*Sachs Freeman Associates, Landover, MD
**SAIC, McLean, VA
- 4B-7 NON-IMMERSED APERTURED FOILLESS DIODES FOR THE**
RECIRCULATING LINEAR ACCELERATOR
M.G. Mazarakis, J.W. Poukey, R.C. Platt, C.A. Frost, J.T. Crow
Sandia National Laboratories, Albuquerque, NM
- 4B-8&9 Invited**
ELECTRON ACCELERATORS DRIVEN BY INTENSE
RELATIVISTIC ELECTRON BEAMS
V. Serlin, Naval Research Laboratory, Washington, DC

- 4 B - 1 0 A BROADBAND CONDENSER OPTIC FOR THE EFFICIENT COLLECTION OF
SOFT X-RAY RADIATION
P.D. Rockett and J.L. Porter
Sandia National Laboratories, Albuquerque, NM
- 4 B - 1 1 STUDIES OF ELECTRON ENERGY DEPOSITION IN A LONG PULSE ELECTRON-
BEAM-PUMPED LASER FOR DIFFERENT GAS MIXTURES
M.A. Sweeney, E.L. Patterson, G.E. Samlin
Sandia National Laboratories, Albuquerque, NM

Tuesday Afternoon, 22 May 1990
2:50 pm -- Room #202

Oral Session 4C
ULTRAFast Z-PINCHES
Chairman: R. Gullickson

- 4C-1 DEVELOPMENT OF A HIGH REPETITION RATE PULSE POWER SOURCE AND
ITS APPLICATIONS TO SOFT X-RAY GENERATION
H. Arita, K. Suzuki, Y. Kurosawa, K. Hirasawa
Hitachi Research Laboratory, Hitachi Ltd., Ibaraki, Japan
I. Ochiai
Central Research Laboratory, Hitachi Ltd., Tokyo, Japan
- 4C-2 PLASMA-EROSION-ENHANCED NEUTRON EMISSION IN FIBER-
GENERATED DENSE Z-PINCHES
D. Mosher and D. Colombant
Naval Research Laboratory, Washington, DC
- 4C-3&4 **Invited**
SCALING KILOVOLT X-RAY EMISSION IN Z-PINCHES
K.G. Whitney and J.W. Thornhill
Naval Research Laboratory, Washington, DC
- 4C-5 SATURN: A 10-MA DRIVER FOR Z-PINCH PLASMA RADIATION SOURCES
R.B. Spielman, J.L. Proter, M.A. Hedemann
Sandia National Laboratory, Albuquerque, NM
- 4C-6 THEORETICAL AND EXPERIMENTAL COMPARISONS OF GAMBLE II
ARGON GAS PUFF EXPERIMENTS
J.W. Thornhill, F.C. Young, K.G. Whitney,
J. Davis, S.J. Stephanakis
Naval Research Laboratory, Washington, DC
- 4C-7&8 **Invited**
**A COMPARISON OF ALUMINUM AND NICKEL WIRE ARRAY
Z-PINCHES AND ALUMINUM EXPLODING SINGLE WIRES**
C. Deeney, T. Nash, P.D. LePell, R.R. Prasad, M. Krishnan*
Physics International Company, San Leandro, CA
*Science Research Laboratory, Alameda, CA
K.G. Whitney, J.W. Thornhill, M.C. Coulter, J. Giuliani
Naval Research Laboratory, Washington, DC

Tuesday Afternoon, 22 May 1990
2:50 pm -- Regency Ballroom G&H

Oral Session 4D
INTENSE BEAM MICROWAVE SOURCES - II
Chairman: A. T. Lin

- 4 D - 1 & 2 **Invited**
THEORY, SIMULATION, AND EXPERIMENTAL RESULTS OF THE
TRANSVERTRON HPM SOURCE
D. Sullivan, C. Woods, M. Arman, R. Clark, T. Genoni, J. Havey,
G. Hutcheson, R. Ingram, S. von Laven
Mission Research Corporation, Albuquerque, NM
- 4 D - 3 ON THE ELECTRON BEAM-BREAKUP TRANSIT TIME OSCILLATOR
T.J.T. Kwan, Pulsed Energy Applications Group, X-10
Los Alamos National Laboratory
M.A. Mostrom, Mission Research Corporation
- 4 D - 4 GRATING-COUPLED OSCILLATORS: THEORY AND THE RESULTS OF
RECENT EXPERIMENTS
J. Jackson, E. Marshall, E. Price, Y. Xu, J. Walsh
Dartmouth College, Hanover, NH
- 4 D - 5 OPERATION OF RELATIVISTIC MAGNETRONS IN A PHASE-LOCKED MODULE
J.S. Levine, J. Benford, B. Harteneck, S. Montalvo
Physics International Company, San Leandro, CA
- 4 D - 6 SIMULATION STUDIES OF THE RELATIVISTIC MAGNETRON
R.A. Stark, H.C. Chen, H.S. Uhm
Naval Surface Warfare Center, White Oak, Silver Spring, MD
- 4 D - 7 UNIVERSAL SCALING AND INITIAL ENERGY DISTRIBUTION
FOR THE MAGNETRON
V. M. Ayres* and J. Walsh
Dartmouth College, Hanover, NH
*NSWC, White Oak, MD
- 4 D - 8 SHORT MICROWAVE PULSES IN LONG PULSE REB SYSTEMS
R.A. Stone, Dept. of Physics
J.S. DeGroot, Dept. of Applied Science
University of California at Davis, Davis, CA
- 4 D - 9 COMPUTER SIMULATION STUDIES OF CYLINDRICAL MILO
MICROWAVE SOURCES
J.W. Eastwood, D.E.T.F. Ashby, T.C. Hender
Culham Laboratory, Abingdon, Oxon, England

Tuesday Afternoon, 22 May 1990
2:50 pm -- Calvin Simmons Ballroom

**Poster Session 4P1
GAS DISCHARGES and
GASEOUS ELECTRONICS:
FUNDAMENTAL PROCESSES**

- 4 P 1 - 1 IMPROVEMENT OF THE E-FIELD TRIGGERED SURFACE BREAKDOWN OF
DIELECTRIC ANODES IN VACUUM ION DIODES
C. Schulthesis, H.U. Karow, W. Petasch
Kernforschungszentrum Karlsruhe GmbH,
Institut für Neutronenphysik und Reaktortechnik, F.R.G.
- 4 P 1 - 2 A NEW METHOD OF MEASURING THE POSITION OF ARC SPOTS--
OPTICAL FIBERS EMBEDDED IN THE WALL OF ELECTRODES
B. Gu and C. Wu. Institute of Mechanics,
Chinese Academy of Sciences, Beijing, P.R. China
- 4 P 1 - 3 A STUDY OF THE HIGH CURRENT DISCHARGE OF THE PSEUDOSPARK
AND BACK LIGHTED THYRATRON SWITCH
G. Kirkman-Amemiya, H. Bauer, R.L. Liou, T.Y. Hsu,
H. Figueroa, M.A. Gundersen
University of Southern California, Los Angeles, CA
- 4 P 1 - 4 STUDIES ON THE BREAKDOWN AND SUSTAINMENT OF HOLLOW
CATHODE DISCHARGES
K.H. Schoenback, L.L. Vahala, G.A. Gerdin, N. Homayoun, F. Loke
Old Dominion University, VA
G. Schaefer, Polytechnic University,
Weber Research Institute, Farmingdale, NY
- 4 P 1 - 5 INTERACTION DYNAMICS OF HOLLOW CATHODE DISCHARGE PLASMAS
A.Y. Ho and S.P. Kuo, Polytechnic University,
Weber Research Institute, Farmingdale, NY
- 4 P 1 - 6 MODELING OF MAGNETICALLY ENHANCED PLANE PARALLEL
CAPACITIVE RF DISCHARGES
M.A. Lieberman and A.J. Lichtenberg
University of California, Berkeley, Berkeley, CA
S.E. Savas, Applied Materials, Inc., Santa Clara, CA
- 4 P 1 - 7 ELECTRON BEAM DIAGNOSTIC FOR ELECTRIC FIELD MEASUREMENT
IN RF DISCHARGES
A.H. Sato and M.A. Lieberman
University of California, Berkeley, Berkeley, CA

- 4 P 1 - 8 NONLINEAR SHEATH MOTION AND STOCHASTIC HEATING IN A
CAPACITIVE RF DISCHARGE
D.P. Wood, M.A. Lieberman, A.J. Lichtenberg
University of California, Berkeley, Berkeley, CA
- 4 P 1 - 9 SHEATH VOLTAGE RATIO FOR ASYMMETRIC RF DISCHARGES
M.V. Alves*, M.A. Lieberman, V. Vahedi, C.K. Birdsall
University of California, Berkeley, Berkeley, CA
*Visitng from INPE-Brazil
- 4 P 1 - 1 0 WORK DONE AND ENERGY BALANCE IN RF DISCHARGES
J.P. Verboncoeur, V. Vahedi, M.A. Lieberman, C.K. Birdsall
University of California, Berkeley, Berkeley, CA
- 4 P 1 - 1 1 A COLLISIONAL MODEL FOR PLASMA IMMERSION ION IMPLANTATION
V. Vahedi, M.A. Lieberman, M.A. Alves*, J.P. Verboncoeur,
C.K. Birdsall
University of California, Berkeley, Berkeley, CA
*Visitng from INPE-Brazil

Tuesday Afternoon, 22 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 4P2
FAST OPENING SWITCHES and
PLASMA FOCUS

- 4 P 2 - 1 EXPLOSIVE PULSED POWER DRIVEN PLASMA GUN EXPERIMENT
J.H. Goforth, A.E. Greene, I.R. Lindemuth, H. Oona,
J.V. Parker, R.E. Reinovsky, D.G. Rickel, P.J. Turchi*
Los Alamos National Laboratory, Los Alamos, NM
*Ohio State University
- 4 P 2 - 2 PLASMA FLOW SWITCH FOR FOIL-IMPLOSION EXPERIMENTS:
SHORT-CIRCUIT-LOAD EXPERIMENTS AT 6 MA
R.R. Bartsch, J.F. Benage, J.C. Cochrane, H.W. Kruse,
P.H.Y. Lee, H. Oona, J.V. Parker, P.J. Turchi*
Los Alamos National Laboratory, Los Alamos, NM
*LANL Consultant, Ohio State University, Columbus, OH
- 4 P 2 - 3 ONE DIMENSIONAL PARTICLE-IN-CELL SIMULATIONS OF A PLASMA
FILLED DIODE WITH AN EXTERNAL CIRCUIT
R.J. Kares, Berkeley Research Associates, Berkeley, CA
- 4 P 2 - 4 COMPUTER SIMULATION OF THE PLASMA FILLED-DIODE
J. Geary, Berkeley Research Associates, Springfield, VA
- 4 P 2 - 5 PLASMA DYNAMICS IN A LONG CONDUCTION TIME PLANAR
PLASMA OPENING SWITCH
L.K. Adler, J.B. Greenly, D.A. Hammer
Cornell University, Ithaca, NY
- 4 P 2 - 6 LONG CONDUCTION TIME POS EXPERIMENTS ON MITE
H.N. Woodall, D.H. McDaniel, C.W. Mendel, G.E. Rochau, D.M. Zaga,
W.W. Simpson, N.P. Zuchowski
Sandia National Laboratories, Albuquerque, NM
- 4 P 2 - 7 PERFORMANCE OF MAGNETICALLY-INJECTED-PLASMA
OPENING SWITCHES ON THE PARTICLE BEAM FUSION
ACCELERATOR II (PBFA II)
G.E. Rochau, D.H. McDaniel, C.W. Mendel, M.A. Sweeney,
W.B.S. Moore, G.R. Mowrer, D.W. Zagar
Sandia National Laboratories, Albuquerque, NM
- 4 P 2 - 8 PLASMA DENSITY MEASUREMENTS IN PBFA-II OPENING SWITCH
CONFIGURATIONS
B.V. Weber, Naval Research Lab, Washington, DC
D.H. McDaniel and G.E. Rochau
Sandia National Laboratory, Albuquerque, NM

- 4 P 2 - 9 INVESTIGATION OF PLASMA OPENING SWITCH WITH GASEOUS PULSED GUNS
 P.S. Anan'in, V.B. Karpov, Ya.E. Krasik, I.V. Lisitsyn*,
 A.V. Petrov, V.G. Tolmacheva
 Institute of Nuclear Physics, Tomsk, USSR
 *Institute of Electrophysics, Sverdlovsk, USSR
- 4 P 2 - 10 SIMULATION OF INDUCTIVE PULSE GENERATOR WITH FUSE AND PLASMA EROSION OPENING SWITCH (PEOS)
 T.A. Golub, N.A. Gondarenko, A.M. Iskoldsy
 Institute of Electrophysics of the USSR
 Academy of Sciences Ural Division, Sverdlovsk USSR
- 4 P 2 - 11 SWITCHING OF A SUPERCONDUCTING Y-Ba-Cu-O THIN FILM BY LASER IRRADIATION
 K. Kato, K. Takahashi, T. Suzuki, K. Nishimaki, K. Minami
 Niigata University, Japan
 N. Hayashi, S. Okuda, S. Takano
 Sumitomo Electric Industries
 M. Ohtsuka, Tokyo Institute of Technology
 M. Awano, Tokyo Engineering University
- 4 P 2 - 12 EXPERIMENTAL STUDY OF POWER GAIN IN AN INDUCTIVE ENERGY PULSED POWER SYSTEM WITH AN OPTICALLY ACTIVATED SEMICONDUCTOR OPENING SWITCH
 C.C. Kung, E.A. Chauchard, C.H. Lee, M.J. Rhee, L. Yan
 University of Maryland, College Park, MD
- 4 P 2 - 13 USE OF A DENSE PLASMA FOCUS AS AN X-RAY IRRADIATION FACILITY
 O. Barnouin, B. Temple, G.H. Miley
 University of Illinois, Urbana-Champaign, IL
- 4 P 2 - 14 TIME AND SPACE RESOLVED OBSERVATION OF HOT SPOTS IN A PLASMA FOCUS
 P. Choi and R. Aliaga
 The Blackett Laboratory, Imperial College, London, U.K.
 H. Herold
 Institut für Plasmaforschung, Universität Stuttgart, F.R.G.
- 4 P 2 - 15 STRUCTURE OF PLASMA SHEATH IN A PLASMA FOCUS DEVICE
 X.X. Wang and T.C. Yang
 Tsing Hua University, Beijing, China
- 4 P 2 - 16 INVESTIGATION OF GAS-PUFFED DISCHARGES OF THE PLASMA-FOCUS TYPE
 M. Sadowski, J. Baranowski, L. Jakubowski, E. Skladnik-Sadowska, A. Szydlowski
 Soltan Institute for Nuclear Studies, Swierk, Poland

- 4 P 2 - 1 7 EXPERIMENTS ON PLASMA FOCUS AND DT MICROBALLOON INTERACTIONS
B.L. Freeman and D.G. Rickel
Los Alamos National Laboratory, Los Alamos, NM
- 4 P 2 - 1 8 ION CLUSTERS, REB, AND CURRENT SHEATH CHARACTERISTICS IN
FOCUSED DISCHARGES
A. Bortolotti, J. Brzosko, P. DeChiara, H. Killic, F. Mezzetti,
V. Nardi, C. Powell, D. Zeng
Stevens Institute of Technology, University of Ferrara
- 4 P 2 - 1 9 DENSITY PROFILE MEASUREMENTS FROM A TWO-GUN
PLASMA FOCUS DEVICE
C.C. Tzeng, C.K. Yeh, T.R. Yeh, Y.Y. Kuo, D.J. Shang,
Y.Z. Yu, W.S. Hou, Institute of Nuclear Energy Research,
Lung-Tan, Taiwan, R.O.C.

Tuesday Afternoon, 22 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 4P3
FAST WAVE MICROWAVE DEVICES

- 4 P 3 - 1 RESEARCH IN COHERENT, FREE ELECTRON, MILLIMETER-WAVE
SOURCES AT THE UNIVERSITY OF WISCONSIN
J.H. Booske, J.E. Scharer, S.F. Chang, and J. Joe
University of Wisconsin, Madison, WI
- 4 P 3 - 2 INITIAL RESULTS FROM HARMONIC UBITRON EXPERIMENT
H. Bluem*, R.H. Jackson, D.E. Pershing**, H.P. Freund***,
V. Granatstein*, Naval Research Laboratory, Washington, DC
*University of MD, College Park, MD
**Mission Research, Newington, VA
***Science Applications International Corporation, McLean, VA
- 4 P 3 - 3 DESIGN OF A HIGH POWER THREE-CAVITY GYROKLYSTRON SYSTEM
W. Main, S. Tantawi, P.E. Latham, W. Lawson, S. Demske,
C.D. Striffler, M. Reiser, V.L. Granatstein
University of Maryland, College Park, MD
- 4 P 3 - 4 OPERATION OF A HIGH POWER, X-BAND GYROKLYSTRON EXPERIMENT
W. Lawson, J.P. Calame, D. Welsh, M. Skopec, B. Hogan,
M. Naiman, W. Main, P.E. Latham, S. Demske, C.D. Striffler,
M. Reiser, V.L. Granatstein, Univ. of Maryland, College Park, MD
- 4 P 3 - 5 STABILITY OF THE UNIVERSITY OF MARYLAND TWO-CAVITY
GYROKLYSTRON AMPLIFIER
P.E. Latham and S. Demske, Univ. of Maryland, College Park, MD
- 4 P 3 - 6 APPLICATION OF THE LIE TRANSFORM METHOD TO THE LINEAR
ANALYSIS OF GYROTRONS
S. Miller, P.E. Latham, C.D. Striffler
University of Maryland, College Park, MD
- 4 P 3 - 7 DIELECTRIC LOADED CARM
K.C. Leou, D.B. McDermott, N.C. Luhmann, Jr.
University of California, Los Angeles, CA
- 4 P 3 - 8 HIGH POWER CARM FOR HIGH GRADIENT RF LINAC
Q.S. Wang, D.B. McDermott, A.T. Lin, N.C. Luhmann, Jr.
University of California, Los Angeles, CA

- 4 P 3 - 9 THE UCLA IR-FEL
 F. Aghamir, W. Barletta*, D. Cline, J. Dodd, S. Hartman, C. Joshi,
 J. Kolonko, N. Luhmann, D. McDermott, C. Pellegrini, C. Terrien
 University of California, Los Angeles, CA
 *also Lawrence Livermore National Laboratory, Livermore, CA
- 4 P 3 - 1 0 BRAGG RESONATOR FOR SELECTIVE FEEDBACK IN OVERMODED
 OSCILLATORS
 C.K. Chong, M.M. Razeghi, D.B. McDermott, N.C. Luhmann, Jr.
 University of California, Los Angeles, CA
- 4 P 3 - 1 1 PREBUNCHED HIGH HARMONIC GYROTRON -- MAGNICON
 C.S. Kou, D.B. McDermott, N.C. Luhmann, Jr.
 University of California, Los Angeles, CA
- 4 P 3 - 1 2 DEVELOPMENT OF HIGH-AVERAGE POWER FEL AMPLIFIERS USING
 SHEET ELECTRON BEAMS AND SHORT-PERIOD WIGGLERS
 D.J. Radack, S.W. Bidwell, T.M. Antonsen, J.H. Booske*,
 Y. Carmel, W.W. Destler, H.P. Freund**, V.L. Granatstein,
 P.E. Latham, B. Levush, W.P. Marable, I.D. Mayergoyz,
 J. Rodgers, Z.X. Zhang, University of Maryland, College Park, MD

Tuesday Afternoon, 22 May 1990
2:50 pm -- Calvin Simmons Ballroom

Poster Session 4P4
MULTIGAP ACCELERATORS AND APPLICATIONS

- 4 P 4 - 1 HEAVY ION INDUCTION LINAC STUDIES AT LBL
 S. Eylon, T.J. Fessenden, T. Garvey
 Lawrence Berkeley Laboratory, Berkeley, CA
- 4 P 4 - 2 A LOW EMITTANCE AND UNIFORM DENSITY CS⁺ SOURCE FOR
 HEAVY ION INDUCTION LINACS
 E. Henestroza and S. Eylon
 Lawrence Berkeley Laboratory, Berkeley, CA
- 4 P 4 - 3 AN ELECTROSTATIC QUADRUPOLE ARRAY FOR FOCUSING
 16 ION BEAMS
 S.K. Mukherjee, Lawrence Berkeley Laboratory, Berkeley, CA
- 4 P 4 - 4 BEAM ENERGY REDUCTION IN AN ACCELERATION GAP
 M.J. Rhee, University of Maryland, College Park, MD
- 4 P 4 - 5 MULTIBUNCH ACCELERATOR OPERATION WITH RF PULSE DISTORTION
 T.L. Houck, G.D. Craig, G.A. Westenskow, S.S. Yu
 Lawrence Livermore National Laboratory, Livermore, CA
 A.E. Vlieks, Stanford Linear Accelerator Center, Stanford, CA
- 4 P 4 - 6 FOCUSING VARIABLE-CURRENT HEAVY-ION BEAMS USING CONSTANT
 STRENGTH QUADRUPOLES
 D.D.-M. Ho, Lawrence Livermore National Lab, Livermore, CA
 K.R. Crandall, AccSys Technology, Inc., Pleasanton, CA

Wednesday Morning, 23 May 1990

8:30 am - Regency Ballroom

**'STATUS OF HEAVY ION INERTIAL
FUSION IN EUROPE'**

***Prof. R. Bock
GSI Darmstadt***

Chairman: J. Mark

Wednesday Morning, 23 May 1990
9:40 am -- Room #203

Oral Session 5A
PLASMA PROCESSING
Chairman: K. Etemadi

- 5A-1&2 **Invited**
PLASMA DESTRUCTION OF HAZARDOUS MIXED WASTE
T.L. Eddy, D.W. Parke, A.D. Donaldson, G.A. Reimann
INEL/EG&G Idaho
- 5A-3 MIXING OF A COLD JET WITH A TRANSVERSE PLASMA FLOW
Z. Njah, J. Mostaghimi, M.I. Boulos
University of Sherbrooke, Sherbrooke, Quebec, Canada
- 5A-4 SILICON NITRIDE DEPOSITION USING N₂-RARE GAS RADIO-
FREQUENCY AFTERGLOWS
R.R. Mitchell, R.M. Young, W.D. Partlow, M.J. Bevan,
P.J. Chantry, L.E. Kline
Westinghouse Electric Corp., Science & Technology Center
Pittsburgh, PA 15235
- 5A-5 MEASUREMENT OF THE SI ATOM DENSITY IN RF SILANE PLASMA
USING ABSORPTION SPECTROSCOPY
T. Goto and M. Sakakibara, Nagoya Univ., Japan
M. Hiramatsu, Meijo Univ., Japan
- 5A-6 RELATIONSHIP BETWEEN THE INDUCTION FREQUENCY AND
LTE IN INDUCTIVELY COUPLED PLASMAS
J. Mostaghimi and M.I. Boulos
University of Sherbrooke, Sherbrooke, Quebec, Canada
- 5A-7 IMPACT OF CATHODE EVAPORATION ON A FREE-BURNING ARC
K. Etemadi
State University of New York at Buffalo, Buffalo, NY
- 5A-8 LASER PRODUCED PLASMAS IN MEDICINE II.
PROPERTIES AND EFFECTS
S.J. Gitomer and R.D. Jones
Los Alamos National Laboratory, Los Alamos, NM
- 5A-9 SPUTTERING MAGNETRON EXPERIMENTS AND MODELING
J. Goree, M.J. Goechner, T.E. Sheridan
The University of Iowa, Iowa City, IA

Wednesday Morning, 23 May 1990
9:40 am -- Oakland Room

Oral Session 5B
FAST OPENING SWITCHES - II
Chairman: J. Neri

- 5B-1&2 **Invited**
REVIEW AND MODELING OF SOVIET EXPLOSIVE PULSE-POWER TECHNOLOGY FOR HIGH ENERGY PLASMA PHYSICS EXPERIMENTS
R.E. Reinovsky, I.R. Lindemuth, S.P. Marsh
Los Alamos National Laboratory, Los Alamos, NM
- 5B-3&4 **Invited**
RADIATION MAGNETOHYDRODYNAMIC MODELING OF PLASMA FLOW SWITCH PERFORMANCE AT HIGH CURRENT LEVELS
R. Bowers, J. Brownell, A. Greene, D. Peterson, T. Oliphant, N. Roderick*, D. Weiss
Los Alamos National Laboratories, Albuquerque, NM
*University of New Mexico, Albuquerque, NM
- 5B-5 ANTHEM SIMULATION OF THE PLASMA FLOW SWITCH
R.J. Mason, N.F. Roderick, J.V. Parker
Los Alamos National Laboratory, Los Alamos, NM
- 5B-6 MOTION OF MAGNETICALLY INJECTED PLASMA IN THE PBFA-II PLASMA OPENING SWITCH DURING THE ACCELERATOR PULSE
M.H. Frese, NumerEx, Albuquerque, NM
- 5B-7 A TWO-DIMENSIONAL MODEL FOR HIGH POWER MAGNETICALLY INSULATED TRANSMISSION LINES
R.N. Sudan, B. Church, D. Longcope
Cornell University, Ithaca, NY
- 5B-8 POS DRIVEN PLASMA FILLED DIODE LOADS
J. Thompson, W. Rix, P. Davis, K. Ware
Maxwell Laboratories, Inc., San Diego, CA
- 5B-9 A PLASMA OPENING SWITCH CONTROLLED BY A DRIFTING PLASMA
J.P. Lidestri, V.L. Bailey, L.J. Demeter, S.D. Putnam, P.W. Spence
Pulse Sciences, Inc., San Leandro, CA

Wednesday Morning, 23 May 1990
9:40 am -- Room #202

Oral Session 5C
MULTIGAP ACCELERATORS AND APPLICATIONS
Chairman: J. Mark

*This session will be dedicated
to the memory of
Dr. Dennis Keefe*

- 5C-1&2 **Invited**
**HIGHLIGHTS OF HEAVY ION FUSION RESEARCH
IN THE U.S. (A Tribute to Dennis Keefe)**
M. Reiser, University of Maryland, College Park, MD
J. Mark, Lawrence Livermore National Lab, Livermore, CA
- 5C-3 SCALING LAWS FOR MIRRORTRON ION ACCELERATORS
R.F. Post, Lawrence Livermore National Lab, Livermore, CA
- 5C-4 THE MIRRORTRON: AN EXPERIMENT TO GENERATE HIGH TRANSIENT
TRANSIENT PLASMA POTENTIALS
S.R. Douglass, R.F. Post, M.A. Lambert
Lawrence Livermore National Laboratory, Livermore, CA
- 5C-5 SIMULATIONS OF ION BEAMS USING THE WARP CODE
A. Friedman, D.A. Callahan, D.P. Grote, A.B. Langdon
Lawrence Livermore National Laboratory, Livermore, CA
I. Haber, U.S. Naval Research Laboratory, Washington, DC
- 5C-6&7 **Invited**
PLASMA AT THE SUPER-COLLIDER
P. McIntyer, Texas A&M, College Station, TX
- 5C-8 ELECTROMAGNETIC INSTABILITY IN A PERIODIC ALTERNATING
GRADIENT QUADRUPOLE FOCUSING SYSTEM
C.-M. Tang and J. Krall
Naval Research Laboratory, Washington, DC
T.P. Hughes, Mission Research Corporation, Albuquerque, NM
D. Chernin
Science Applications International Corporation, McLean, VA

- 5C-9 A GENERAL THEORY OF BEAM BREAKUP INSTABILITIES
 Y.Y. Lau and D.G. Colombant
 Naval Research Laboratory, Washington, DC
- 5C-10 SLIA BEAM LINE DESIGN
 J. Petillo, D. Chernin, C. Kostas, A. Mondelli
 Science Applications International Corp., McLean, VA

Wednesday Morning, 23 May 1990
9:40 am -- Rooms #210-211

Oral Session 5D
FAST WAVE MICROWAVE DEVICES
Chairman: I. Alexeff

- Invited**
- 5 D - 1 & 2 **A 0.5 MW QUASI-OPTICAL GYROTRON EXPERIMENT**
T.A. Hargreaves, A.W. Fliflet, W.M. Manheimer,
R.P. Fischer, M.L. Barsanti*
U.S. Naval Research Laboratory, Washington, DC
*Jaycor Inc., Vienna, VA
- 5 D - 3 RECENT ADVANCES IN ORBITRON MICROWAVE DEVELOPMENT
F. Dyer, M. Rader, A. Matas, B. Bernhard, I. Alexeff
University of Tennessee, Knoxville, TN
- 5 D - 4 A 35 GHz FREE ELECTRON LASER AMPLIFIER OPERATING WITH HIGH
GUIDE MAGNETIC FIELD
M.E. Conde, G. Bekefi, J.S. Wurtele
Massachusetts Institute of Technology, Cambridge, MA
- 5 D - 5 TUNABLE MICROWIGGLER FREE ELECTRON LASER EXPERIMENT
R. Stoner, S.C. Chen, G. Bekefi
Plasma Fusion Center, MIT, Cambridge, MA
- 5 D - 6 A COMPACT, 35 GHz, PHASE-LOCKED GYROTRON OSCILLATOR WITH
SUBHARMONIC INJECTION
H. Guo, Y. Carmel, V.L. Granatstein
University of Maryland, College Park, MD
E. Scannell and S. Spang
AAI Corporation, Hunt Valley, MD

Wednesday Morning, 23 May 1990
9:40 am -- Calvin Simmons Ballroom

**Poster Session 5P1
PLASMA PROCESSING**

- 5 P 1 - 1 HYDRODYNAMICS OF EXCIMER LASER ABLATION OF POLYMERS IN
ATMOSPHERIC PRESSURE GAS
P.L.G. Ventzek and R.M. Gilgenbach
University of Michigan, Ann Arbor, MI
- 5 P 1 - 2 ION TEMPERATURE IN AN ELECTRON CYCLOTRON RESONANCE
PLASMA AS DETERMINED BY LASER INDUCED FLUORESCENCE
DOPPLER WIDTH MEASUREMENTS
E.A. Den Hartog, H. Persing, R.C. Woods
University of Wisconsin, Madison, WI
- 5 P 1 - 3 DYNAMIC SHEATH STUDIES IN PLASMA SOURCE ION IMPLANTATION
J.T. Scheuer, M. Shamim, J.R. Conrad
University of Wisconsin, Madison, WI
- 5 P 1 - 4 PC BASED NUMERICAL SIMULATION OF PLASMA SOURCE
ION IMPLANTATION
G.A. Emmert, University of Wisconsin
- 5 P 1 - 5 VERY LOW PRESSURE RF GLOW DISCHARGE PLASMA USING
MULTI-DIPOLE SURFACE MAGNETIC FIELDS
N. Hershkowitz, M.H. Cho, A. Wendt, J. Pruski
University of Wisconsin-Madison
- 5 P 1 - 6 RF DISCHARGE WITH MULTIDIPOLE SURFACE MAGNETIC
CONFINEMENT FOR LOW PRESSURE PLASMA ETCHING
A. Wendt, N. Hershkowitz, R.C. Woods
University of Wisconsin-Madison
- 5 P 1 - 7 MICROWAVE PLASMA ETCHING OF SILICON AND SILICON DIOXIDE
C. Grabowski and J. Gahl
University of New Mexico, Albuquerque, NM
- 5 P 1 - 8 ION POWER LOSSES AT THE ELECTRODE SHEATHS IN A
SYMMETRIC RF DISCHARGE
V.A. Godyak and R.B. Piejak
GTE Laboratories, Waltham, MA

Wednesday Morning, 23 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session 5P2
BEAM AND PLASMA ACCELERATORS

- 5 P 2 - 1 THREE-DIMENSIONAL NONLINEAR TRANSVERSE BEAM DYNAMICS
OF A RADIO-FREQUENCY QUADRUPOLE: COMPARISON OF PARMTEQ
WITH AN EXACT IMAGE-CHARGE CALCULATION
B.D. Murphy, J.H. Whealton, R.J. Raridon, K.E. Rothe,
W.R. Becraft, P.M. Ryan
Oak Ridge National Laboratory, Oak Ridge, TN
- 5 P 2 - 2 SIMULATED RAMAN FORWARD SCATTERING AND RELATIVISTIC
MODULATIONAL INSTABILITY OF LIGHT WAVES IN RAREFIED PLASMA
C.J. McKinstrie, L. Mu, M. Yu
Laboratory for Laser Energetics
R. Bingham
Rutherford Appleton Laboratory
- 5 P 2 - 3 NUMERICAL SIMULATION OF THE MIRRORTRON
D.L. Larson, University of California, Davis, Davis, CA
D.W. Hewett, Lawrence Livermore National Laboratory,
Livermore, CA
- 5 P 2 - 4 MODELING OF AN RF ELECTRON ACCELERATOR
S.J. Gitomer and M.E. Jones
Applied Theoretical Physics Division, Los Alamos National
Laboratory, Los Alamos, NM
- 5 P 2 - 5 EXPERIMENTAL RESULTS OF ELECTRON ACCELERATION USING
VpXB LINAC
N. Yugami, Y. Nishida, T. Taura
Utsunomiya University, Utsunomiya, Tochigi, Japan
- 5 P 2 - 6 NONLINEAR WAKEFIELD GENERATION AND OPTICAL GUIDING OF LASER
PULSES IN PLASMAS
E. Esarey, P. Sprangle, A. Ting, G. Joyce
Naval Research Laboratory, Washington, DC
- 5 P 2 - 7 DESIGN OF A PLASMA LENS EXPERIMENT FOR THE SLAC FINAL
FOCUS TEST FACILITY
S. Rajagopalan and D. Cline
University of California, Los Angeles, CA
P. Chen, Stanford Linear Accelerator Center, Stanford, CA

Wednesday Morning, 23 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session 5P3
INTENSE ELECTRON AND ION BEAMS

- 5 P 3 - 1 PIC SIMULATIONS IN AN EMISSIVE DIODE WITH DIFFERENT
FLOW DURATION
 S.-H. Li, Y.-S. Chen, and C.-S. Hwang*
 National Tsing Hua University, Taiwan, R.O.C.
 *Institute of Nuclear Energy Research, Lung Tan Taiwan, R.O.C.
- 5 P 3 - 2 FIELD ERROR RESONANCES IN THE NRL MODIFIED BETATRON
ACCELERATOR
 P. Sprangle, E. Esarey, S.J. Marsh*
 Naval Research Laboratory, Washington, DC
 *Sachs Freeman, Landover, MD
- 5 P 3 - 3 TRANSPORT OF RELATIVISTIC ELECTRON BEAMS ALONG WIRE ARRAYS
 R.A. Richardson, J. Denavit, P.W. Rambo
 Lawrence Livermore National Laboratory, Livermore, CA
- 5 P 3 - 4 HYBRID SIMULATION OF HIGH-POWER ION BEAM TRANSPORT AND
ION BEAM FOCUSING THROUGH A GAS CHAMBER
 C.L. Chang, C. Agritellis, A. Mankofsky, A.T. Drobot
 Science Applications International Corporation, McLean, VA
- 5 P 3 - 5 EMITTANCE MEASUREMENTS USING A FINITE SLIT-HOLE
EMITTANCE METER
 R.F. Schneider and M.J. Rhee
 Naval Surface Warfare Center, White Oak, Silver Spring, MD
 University of Maryland, College Park, MD
- 5 P 3 - 6 ION BEAM TRANSPORT AND FOCUS FOR LMF USING AN ACHROMATIC
SOLENOIDAL LENS SYSTEM
 C.L. Olson
 Sandia National Laboratories, Albuquerque, NM
- 5 P 3 - 7 SIMULATION STUDY OF APPLIED-B ION DIODES WITH PLASMA PREFILL
 S.E. Rosenthal
 Sandia National Laboratories, Albuquerque, NM
- 5 P 3 - 8 CONVERSION OF RELATIVISTIC ELECTRON BEAM TO HARD PHOTON BEAM
VIA INVERSE COMPTON SCATTERING
 H. Lee, Los Alamos National Laboratory, Los Alamos, NM

- 5 P 3 - 9 TIME-RESOLVING ELECTRON ENERGY ANALYZER MEASUREMENTS OF
INTENSE RELATIVISTIC BEAM TRANSPORT
D.J. Weidman*, M.J. Rhee*, R.F. Schneider
Naval Surface Warfare Center, Silver Spring, MD
*Advanced Technology and Research, Laurel, MD
- 5 P 3 - 1 0 NEUTRAL GAS FILLED TRANSPORT CELLS FOR HIGH CURRENT
ELECTRON BEAMS
M.C. Myers, J.A. Antoniadis*, R.A. Meger, R.E. Pechacek,
T.A. Peyser**, D.P. Murphy
Naval Research Laboratory, Washington, DC
*Sachs Feeman Associates Inc., Landover, MD
**Science Applications International Corp., McLean, VA
- 5 P 3 - 1 1 OPERATION OF A HIGH REPETITION RATE INTENSE ION BEAM DIODE
W.A. Noonan, S.C. Glidden, J.B. Greenly, D.A. Hammer, L. Brisette
Laboratory of Plasma Studies, Cornell University, Ithaca, NY
- 5 P 3 - 1 2 ANALYSIS OF ION FOCUSING PARAMETERS ON PBFA-II
L.P. Mix, W.A. Stygar, M.P. Desjarlais
Sandia National Laboratories, Albuquerque, NM
- 5 P 3 - 1 3 ION HOSE INSTABILITY OF AN INTENSE BEAM WITH A BENNETT PROFILE
X. Zhang and C.D. Striffler, University of Maryland, College Park
R.L. Yao, Mission Research Corporation

Wednesday Morning, 23 May 1990
9:40 am -- Calvin Simmons Ballroom

Poster Session 5P4
POST DEADLINE PAPERS

5 P 4 - 1 SIMPLIFIED MEASUREMENT OF PLASMA TEMPERATURES
WITHOUT ABEL INVERSION
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