

Paper	Page	Paper	Page
Monday, 15 May 1978, Morning			
SESSION 1A: LASER PLASMA INTERACTIONS I			
1A1-2	1	1C2	21
1A3	1	1C3	22
1A4	1	1C4	23
1A5	1	1C5	24
1A6	2	1C6	25
1A7	3	1C7	26
1A8	4	1C8	27
1A9	5	1C9	28
1A10	6	1C10	29
1A11	7	Monday, 15 May 1978, Morning	
1A12	8	SESSION 1D: FIELD REVERSED RING CONFIGURATIONS	
Monday, 15 May 1978, Morning			
SESSION 1B: NEUTRAL BEAMS FOR FUSION RESEARCH			
1B1	9	1D1	30
1B2	10	1D2	31
1B3-4	11	1D3	32
1B5	12	1D4	33
1B6	13	1D5-6	34
1B7	14	1D7	35
1B8	14	1D8	36
1B9	15	1D9	37
1B10	16	Monday, 15 May 1978, Morning	
1B11	17	POSTER SESSION 1P: PLASMA DIAGNOSTICS AND PLASMA HEATING	
1B12	18	1P1	38
Monday, 15 May 1978, Morning			
SESSION 1C: THERMIONICS AND PLASMA DIODES I			
1C1	19	1P2	39
		1P3	40
		1P4	41
		1P5	42
		1P6	43
		1P7	44
		1P8	45
		1P9	46
		1P10	47

Paper	Page	Paper	Page		
1P11	Electrical Conductivity of High Pressure Ionized Argon, Z. Stokic, S. Popovic	48	2B10	Experimental and Theoretical Study On Transient Magnetic Field and Magnet Stress, Kenzo Miya, Kosei Hara, and Yoneho Tabata	72
1P12	Improved Energy Coupling in the AFWL Shiva Pulsed Radiation Source Experiment, W.L. Baker, M.C. Clark, J.H. Degnan, G.F. Kiuttu, R.E. Reinovsky	49	2B11	Transmission-Line Approach to Fast Inductive Storage Pulsers, W.H. Lupton, D. Conte, R.D. Ford, J.D. Shipman and I.M. Vitkovitsky	73
1P13	Time Resolved Spectral Measurements of Imploding Foil Liner Radiation Source, J.H. Degnan, R.E. Reinovsky, G.F. Kiuttu, M.C. Clark, W.L. Baker	50	2B12	Pulsed Energy Storage and Transfer at ANL for the Fusion Power Program, R.P. Smith, R.L. Kustom, R. Fuja, and R. Wpherle	74
1P14	Time-Resolved X-Ray Pinhole Camera Photographs of Electromagnetically Imploded Plasmas, G.F. Kiuttu, D.M. Woodall,	51	Monday, 15 May 1978, Morning		
1P15	Tokamak Heating by Means of Intense Pulsed Ion Beams, W. Peter, S. Robertson, A. Ron, F. Wessel	52	SESSION 2C: THERMIONICS AND PLASMA DIODES II		
1P16	RF Heating of an ELMO Bumpy Torus (EBT), J.H. Mullen, J.C. Sprott	53	2C1	Thermionic Emission Microscopy of Yttrium Boride Compounds, D. Jacobson, and J. Jaskie	75
Monday, 15 May 1978, Afternoon			2C2	Some Properties of Low Vapor Pressure Braze Alloys for Thermionic Converters, V.L. Bair	76
SESSION 2A: LASER PLASMA INTERACTIONS II			2C3	Negative Ion Emission from Cesium Electrodes, L.K. Hansen and N.S. Rasor	77
2A1	CO <sub>2</sub> Laser Heating of Long Magnetically Confined Plasma Columns in A Staged Theta-Pinch Mode, Alan L. Hoffman, Dennis D. Lowenthal and Edward A. Crawford	54	2C4	Negative Ion Species in Cesium Discharges, D.E. Sutliff, D.G. Kuehn, and L.M. Chanin	78
2A2	Resonant Laser Cesium Plasma Density Enhancement, Ramesh Chandra and C.N. Manikopoulos	55	2C5	The Advanced Thermionic Converters with External Ionization Mechanisms, C.N. Manikopoulos, M. Hatziprokopiou, C.H. Lee, Nisar Shah and D.T. Shaw	79
2A3	Photoionization Bleaching Wave Propagation in Helium, M.G. Drouet, G. Beaudry and M.M. Shoucri	56	2C6	A Computer Analysis of Thermionic Converter Plasma Parameters, Chi-Chung Wang	80
2A4	Electron Density Measurements Associated with Magnetic Field Determinations in Laser-Produced Plasmas, E.A. McLean, J.A. Stamper, and B.H. Ripin	57	2C7	Ionization Kinetics in a Thermionic Cesium Plasma, J. Lawless and S.H. Lam	81
2A5	Fast Ion Measurement From CO <sub>2</sub> Laser Produced Plasma, Tai Ho Tan, D. Giovanelli, G.H. McCall, A. Williams	58	2C8	Experimental Analysis of Nonequilibrium Population Densities in Thermionic Cesium Plasmas, P.E. Oettinger	82
2A6	Measurements of Hydrodynamic Energy Transport in Planar, Laser-Target Interaction Experiments, D. Woodall, M. Gusinow, J. Anthes, M.K. Matzen	59	2C9	Analytical Model for Auxiliary Ion Source Thermionic Converters, E.J. Britt, G.L. Hatch, and L.K. Hansen	83
2A7-8	<u>Invited Paper.</u> Laser Fusion and Laser Plasma Interaction Experiments, Erik Storm	60	Monday, 15 May 1978, Afternoon		
2A9	High Energy X-Ray Spectra of Laser-Produced Plasmas, Ping Lee and David B. vanHulsteyn	60	SESSION 2D: PLASMA-SURFACE INTERACTIONS, COLLISION PROCESSES		
2A10	Effects of Target Material, Geometry and Prepulse Timing On the Brillouin Backscatter Instability, B.H. Ripin, E.A. McLean, and J.A. Stamper	61	2D1	Merged Electron-Ion Beam Experiments Relevant to Fusion, J.B.A. Mitchell, V.D'Angelo, H.R. Froelich, C.J. Keyser, P.M. Mul, P. d'France and J.Wm. McGowan	84
2A11	Space Charge Effects in Laser Plasma Particle Diagnostics, Steven J. Gitomer and Henry Brysk	62	2D2	The Production of Secondary Electrons From Thin Foils and For Ion-Atom Collisions, K.C. Chiu, J. Wm. McGowan, H.R. Froelich and W. Meckbach	85
2A12	Pulsed Laser Propagation Through 10.6 μm Laser Induced Aerosol Breakdowns, D.E. Lencioni and P.D. Henshaw	63	2D3	Production of Negative Hydrogen Ions by Sputtering, M. Seidl and A.N. Pargellis	86
2A13	Air Breakdown Initiated by Particles in an HF Laser Beam, D.E. Lencioni and L.C. Pettingill	64	2D4-5	<u>Invited Paper.</u> The Physics of Impurity Generation in Tokamaks, Lena Ören	87
Monday, 15 May 1978, Afternoon			2D6	Conditions During Low Z <sub>eff</sub> Operation of ISX-A, R.J. Colchin, C.E. Bush, R.E. Clausing, P.H. Edmonds, L.C. Emerson, Y. Gomay, K.W. Hill, R.C. Isler, R.V. Neidigh, M. Murakami and J.E. Simpkins	88
SESSION 2B: MAGNETICS AND ENERGY STORAGE			2D7	Sputtering an Important Source for Plasma Contaminations, J. Bohdanský	89
2B1-2	<u>Invited Paper.</u> Magnetic Divertors for Tokamaks, D.M. Meade	65	2D8	Low Energy Ion Impact Phenomena On Single Crystal Surfaces, Barbara J. Garrison, D.E. Harrison, Jr., Nicholas Winograd	90
2B3	Calculation of Transient Eddy Currents In A Finite Plane Sheet, U.R. Christensen and D.W. Weissenburger	65	2D9	Surface Damage and Erosion of TFTR Beam Dump Materials By Energetic D <sup>+</sup> -Ion Irradiation, M. Kaminsky, S.K. Das, and P. Dusza	91
2B4	Time Varying Eddy Currents On A Conducting Surface In 3-D Using A Network Mesh Method, U.R. Christensen and D.W. Weissenburger	66	2D10	An Evaluation of Coated Heat Sink Materials for Fusion Applications, D. Doll and M. Ulrickson	92
2B5	A Preliminary DEALS Magnet System Design Study for HFTR, S. Hsieh, J. Powell, P. Bezler, D. Gardner, M. Reich, and C. Laverick, M. Finkelman, T. Brown, J. Bundy, R. Herberman, and E. VonKeszyscki	67	2D11	Kinetic Ejection of Electrons From Oxidized Ag-Mg Dynode (98.5% Ag) Of A Particle-Multiplier by the Impact Of Singly Charged Alkali Ions, Faizan Ul Haq and Muhammad Afzal Chaudhry	93
2B6	Equilibrium and OH Coil Systems for the Long Pulse Experiment (LPX) Tokamak, R.D. Hay	68	Monday, 15 May 1978, Afternoon		
2B7	Field Analysis of Toroidal Systems with Unsaturated Iron Cores, R.W. Moses and R.L. Hagenson	69	POSTER SESSION 2P: INTENSE ELECTRON AND ION BEAMS, AND NEUTRAL BEAMS FOR FUSION RESEARCH		
2B8	The Calculation of Eddy Current on Vacuum Vessel for Plasma Control, H. Ninomiya, A. Ogata, Y. Sawada, Y. Tanabe, K. Yamamoto	70	2P1	Annular Electron Beam Propagation in an Evacuated, Equipotential Cylinder at Relativistic Energies in The Steady-State, Strong Magnetic Guide Field Limit, T.C. Genoni and W.A. Proctor	94
2B9	A New Constant Tension Toroidal Field Coil Design, W.C. Brenner	71			

Paper		Page	Paper		Page
2P2	Studies of Microsecond E-Beam Diodes, J.J. Ramirez, D.L. Cook	95	3B8	A Time Resolved X-Ray Spectrometer, R.W. Vesel, C.E. Speck and O.K. Mawardi	123
2P3	Electron Emission Studies of Planar Diodes for Low Current Density, Microsecond E-Beam Accelerators, R.S. Clark, J.J. Ramirez, K.R. Prestwich	96	3B9	Cine Holographic Interferometry, P.R. Forman, W.T. Armstrong	124
2P4	A Transformer Pulse Power Supply for Ion Beam Generation, F. Wessel, J. Schneider, S. Robertson	97	3B10	The Effect of Plasma Shielding on the Fidelity of Magnetic Probe in a Plasma Focus Environment, Oved S. Zucker	125
2P5	Beam-Plasma Heating Model, A.W. Ali, K.A. Gerber, D.A. Hammer	98		Tuesday, 16 May 1978, Morning	
2P6	Autoaccelerator Dynamics and Stability, John G. Siambis	99		SESSION 3C: PLASMAS FOR FUSION RESEARCH I	
2P7	Resistive Wall Trapping of Electron Layers in the University of Maryland Electron Ring Accelerator, R.A. Meger, D.W. Hudgings, E. Lindstrom, C.D. Striffler	100	3C1-2	Invited Paper. The Alcator Program and the Compact Experiments Approach to Ignition, Bruno Coppi	126
2P8	Intense Proton Beam Current Measurement Via Prompt $\gamma$ Rays from Nuclear Reactions, J. Golden, R.A. Mahaffey, J.A. Pasour, F.C. Young and C.A. Kapetanakos	101	3C3	Equilibrium Operation on RENTOR, J.F. Pipkins, W.C. Jennings, and R.L. Hickok	127
2P9	Alfven Limit for a Bennett Profile, H.O. Dogliani, K.A. Dreyer	102	3C4	Plasma Confinement Results From ISX-A, P.H. Edmonds, M. Murakami, C.E. Bush, R.J. Colchin, J.L. Dunlap, R.C. Isler and G.H. Neilson	128
2P10	Consideration of Grid Design for a Continuously Operated Neutral-Beam Injector, A. Blum, J.H. Fink, M.A. Hoffman	103	3C5	Empirical Scaling Laws for Energy Confinement Time From Ohmically-Heated Tokamaks, R.E. Waltz, G.E. Guest, and W.W. Pfeiffer	129
2P11	Experiments with a Gas Jet Neutralizer for Neutral Beam Systems, C.K. Lam	104	3C6	Optimization of Tokamaks for MHD Stability, D. Dobrott, F.J. Helton, R.W. Moore, and L.C. Bernard	130
2P12	Negative Ion Sources for Neutral Beam Lines, K. Prelec and M.W. Grossman	105	3C7	Theoretical Studies for the Elmo Bumpy Torus (EBT) Device, D.A. Spong, D.B. Batchelor, L. Deleano, R.C. Goldfinger, C.L. Hedrick, E.F. Jaeger, L.W. Owen, J.S. Tolliver	131
2P13	Plasma Instability Effects on Ion Beams in Gas Neutralizers, Stephen E. Savas	106	3C8	The Krakatoa Experiment, J.C. Stevens, J.C. Cochrane, D.L. Davis, R.C. Harding, D.M. Kraybill, I.R. Lindemuth, L.J. Suter	132
	Tuesday, 16 May 1978, Morning		3C9	Krakatoa K-1 Pinch Design Calculations and Preliminary Results, D.M. Kraybill, L.J. Suter, J.C. Cochrane, D.L. Davis, R.C. Harding, I.R. Lindemuth, J.C. Stevens	133
	SESSION 3A: INTENSE ELECTRON AND ION BEAMS I ION BEAMS FOR INERTIAL CONFINEMENT FUSION		3C10	The Dynamics of a Pinch Discharge During Preionization, I.R. Lindemuth, J.C. Cochrane, D.L. Davis, R.C. Harding, D.M. Kraybill, J.C. Stevens, L.J. Suter	134
3A1	Reflex Tetrode with Unidirectional Ion Flow, J.A. Pasour, R.A. Mahaffey, J. Golden, C.A. Kapetanakos	107	3C11	The Destruction of Adiabatic Invariants in Systems With Many Degrees of Freedom, M.A. Lieberman, J.L. Tennyson	135
3A2	Studies of Efficient Ion Beam Generation with Reflex Tetrodes, R.A. Mahaffey, J.A. Pasour, J. Golden, and C.A. Kapetanakos	108	3C12	Characteristics of Pulsed DT and DD Fusion Plasma Burns, A.C. Smith, Jr., C.P. Ashworth, T. Chu and W.C. Condit, Jr.	136
3A3	The Pinch-Reflex Diode - A High Efficiency Ion Source, Roswell Lee and Shyke A. Goldstein	109		Tuesday, 16 May 1978, Morning	
3A4	Emission and Propagation Characteristics of Ions From Pinched Beam Diodes, S.J. Stephanakis, G. Cooperstein, Shyke A. Goldstein, D. Mosher and W.F. Oliphant	110		SESSION 3D: PLASMA WAVES, INSTABILITIES, AND ANTENNAS	
3A5-6	Invited Paper. Power Flow Considerations for Inertial Confinement Particle Beam Accelerators, J. Pace VanDevender	111	3D1	The Major Tokamak Disruption, R.B. White	137
3A7	Pulse Shaping and Power Multiplication of Intense Light Ion Beams, Shyke A. Goldstein, G. Cooperstein, Roswell Lee, D. Mosher, P.F. Ottinger, and A. Sternlieb	112	3D2	Enhanced Transport in the Presence of Low Frequency RF Heating in Toroidal Devices, J.L. Shohet	138
3A8	Fluid Modeling of Neutralization in Ion Beams Traversing Plasma Backgrounds, D. Mosher, D.G. Colombant, Shyke A. Goldstein, and Roswell Lee	113	3D3	Plasma Impedance Measurements at the Lower Hybrid Frequency, S.E. Rosenthal, W.P. Ballard, D.B. Ilic, and F.W. Crawford	139
3A9	Light-Ion Transport Experiments, F.L. Sandel, G. Cooperstein, Shyke A. Goldstein, and D. Mosher	114	3D4	Excitation of Lower Hybrid Waves by 2 and 4 Waveguide Arrays, S. Bernabei, R.W. Motley, W.M. Hooke	140
3A10	Design Considerations for a 10 kA, 1.5 MV Pulsed Linear Ion Accelerator, S. Humphries, Jr.	115	3D5	Pump Depletion and Anomalous Absorption in Parametric Decay Instabilities, S.P. Kuo, K.A. Connor, and B.H. Quon	141
3A11	Power Transport in Magnetically Insulated Vacuum Transmission Lines, Marco S. Di Capua and Donald G. Pellinen	116	3D6	Harmonic Generation of the Electrostatic Ion Cyclotron Wave in a Uniform Magnetoplasma, S.P. Kuo, B.R-S. Cheo	142
	Tuesday, 16 May 1978, Morning		3D7	Linear Wave Coupling and Growth in the Long Delayed Echo Mechanism, T.L. Savarino and F.W. Crawford	143
	SESSION 3B: PLASMA DIAGNOSTICS I		3D8	Response of Ion Acoustic Waves to an Impulse, O. Ishihara and A. Hirose	144
3B1	Absolute Experimental Cross Sections for the Electron Impact Ionization of $Rb^+$ Ions for Use in Ion Beam Probe Calibration, D.W. Hughes, R.K. Feeney, W.E. Sayle, II	117	3D9-10	Invited Paper. Amplitude Saturation of Electron-Ion Two-Stream Instability, O. Ishihara and A. Hirose	145
3B2	Plasma Heating Effects on the EBT Space Potential, S.P. Kuo, F.M. Bieniosek, K.A. Connor, R.L. Hickok	118		Tuesday, 16 May 1978, Morning	
3B3-4	Invited Paper. Diagnostic Techniques for the Investigation of Laser Fusion Targets, N.M. Ceglio	119		SESSION 3E: NUCLEAR-PUMPED LASERS	
3B5	Momentum Sensor for Detecting Neutral Atomic Beams, Frederick A. White and Gerard P. Szatkowski	120	3E1	Gain and Power Measurements of Nuclear-Pumped Lasers, N.W. Jalufka, R.J. DeYoung and F. Hohl	146
3B6	Vacuum Ultraviolet Emission Spectrum in a Relativistic Electron-Beam Discharge, P.S.P. Wei, J.R. Beymer and J.L. Adamski	121	3E2	Generation of Fissioning Uranium Plasmas and Nuclear Pumping of Lasers with the Skua Prompt Burst Reactor, C.R. Mansfield, J.F. Davis, P.F. Bird, T.F. Wimett and H.H. Helmtck	147
3B7	Small, Fast X-Ray Sources, D.J. Nagel	122	3E3	Emission Coefficient Investigation for Singly Ionized Uranium from 1050 to 6000 Angstroms, Joseph M. Mack	148

Paper		Page	Paper		Page
3E4	Fuel Density Options for an Uranium-Excimer Nuclear Laser, D.R. Womack, B. McDaniel and T.G. Miller	149	4A10	Multiple Beam REB Fusion, J.R. Freeman, P.A. Miller, L. Baker, J.P. Quintenz, T.P. Wright, J.W. Poukey, L.P. Mix, and M.H. Widner	177
3E5	Optimization of a Nuclear Pumped CO Laser Using 2 MV Protons, Thomas G. Miller, John R. Williams, Eugene J. Clothiaux and Michael J. Monahan	150	4A11	The C-Diode, A Highly Efficient REB Diode for Target Irradiation, J. Chang, C.W. Mendel, S.A. Goldstein, and J.P. Quintenz	178
3E6	Electronic State Populations of (n,p) Excited <sup>3</sup> He, J.W. Griffin, L.D. Luker and R.T. Schneider	151		Tuesday, 16 May 1978, Afternoon	
3E7-8	<u>Invited Paper.</u> Nuclear Pumped Lasers, G.H. Miley	152		SESSION 4B: PLASMA DIAGNOSTICS II	
	Tuesday, 16 May 1978, Morning		4B1	Detection of Lower Hybrid Waves by Microwave Scattering, R.W. Motley, F.J. Paoloni, S. Bernabei, W.M. Rooke	179
	POSTER SESSION 3P: LASER-PLASMA INTERACTIONS AND COMPUTER APPLICATIONS TO PLASMA SCIENCE		4B2	A Frequency Shifted Laser Interferometer Capable of Measuring Fractional or Multiple Fringe Shifts, D.R. Huber, P.O. Berrett, L.V. Knight and G. Miner	180
3P1	High Energy Ions from a Nd-Laser Plasma, R. Decoste, B.H. Ripin	153	4B3	Microwave Interferometer Measurements in 2XII B Plasmas with Large Line Densities, A.H. Futch, W.F. Cummins, T.C. Simonen, and B.W. Stallard	181
3P2	A Deuterium Plasma Generation System, R.E. Pechacek, J.R. Greig and M. Raleigh	154	4B4	Broadband U.V. Photoelectric Detector Array on the Macrotron Tokamak, S.J. Zweben, C.R. Menyuk, and R.J. Taylor	182
3P3	Target Design to Achieve 20X Liquid Density with a CO <sub>2</sub> Laser, W.P. Gula	155	4B5	Abel Inverted UV and Soft X-Ray Images of the Alcator Plasma, F.H. Seguin, M. Gerassimenko, R. Petrasso, J. Ting, R. Granetz, and R.R. Parker	183
3P4	CO <sub>2</sub> Laser Heating Phenomena in a Fast Solenoid Plasma, H.W. Hoida and G.C. Vlases	156	4B6	Electron Thermal Conductivity in the Alcator Plasma, R. Petrasso, F.H. Seguin, M. Soler, A. Navarro, J. Callen, R. Granetz, and A. Gondhalekar	184
3P5	Magnetoplasma Absorption of Intense Laser Light on Self-Consistent Density and Temperature Profiles, A.L. Peratt	157	4B7	X-Ray Motion Picture of a Major Disruption in Alcator, R. Petrasso, D. Chase, M. Gerassimenko, W. Hamilton, B. Holmes, R. Krogstad, B. Pinsky, F.H. Seguin, J. Ting and R. Granetz	185
3P6	Thermal Coupling for Different Laser Pulse Shapes, W.E. Maher and R.B. Hall	158	4B8-9	<u>Invited Paper.</u> Toroidal Plasma Current Density Measurements by Faraday Rotation, C.F. Barnett	186
3P7	Prepulse Damage To Targets and Alignment Verification, Robert F. Benjamin and Gottfried Schappert	159		Tuesday, 16 May 1978, Afternoon	
3P8	The Transient Penetration of an Electric Field into a Weakly Conducting Layer with an Induced Conductivity Gradient, K.E. Lonngren, and S.M. Reddy	160		SESSION 4C: PLASMAS FOR FUSION RESEARCH II	
3P9	Multiple Pass CO <sub>2</sub> Laser Heating of a Theta Pinch Plasma, R.D. Brooks, R.G. Watt, Z.A. Pietrzyk, G.C. Vlases	161	4C1	Reduction of Flow Loss in a Linear Plasma Column by Cold Gas End Stopping - Experiment and Interpretation, L.C. Johnson and T.K. Chu	187
3P10	Comparison of Measured Critical and Quarter-Critical Trajectories with Predicted Expansions of Spherical Laser Fusion Targets, T.A. Leonard and R.A. Cover	162	4C2	An End-Plugged, Steady State Linear Magnetic Fusion Reactor as an Energy Amplifier, T.K. Chu and L.C. Johnson	188
3P11	Tokamak Plasma Modelling, V.L. Teofilo, J.K. Thompson	163	4C3-4	<u>Invited Paper.</u> Status and Outlook for the Magnet Fusion Program, John F. Clarke	189
3P12	Numerical Simulation of a Short Pulse Imploding Liner, D.A. Kloc, T.W. Hussey, N.F. Roderick,	164	4C5	Axial Heating of Linear Magnetic Fusion Systems, R. Morse, P. McKenty and C. Sowers	189
3P13	Numerical Simulation of the Implosion of Non-Metallic Plasma Liners, T.W. Hussey, N.F. Roderick, D.A. Kloc	164	4C6	End Plugging of a Linear Theta Pinch by Hypocycloidal-Pinch Plasmas, Ja H. Lee and John P. Barach	190
3P14	Simulation of Space-Charge Limited Current in a Solid and an Annular Relativistic Electron Beam, D.J. Sullivan, N.F. Roderick	165	4C7	Effects of Radiation from Linear $\theta$ -Pinch End Plugs, P. McKenty, R. Morse, C. Sowers	191
3P15	Solving Sparse Matrix Equations on a Vector Computer,	166	4C8	Plasma End Losses from the Scylla IV-P 5 meter Linear Theta Pinch, R.R. Bartsch, R.J. Comisso, C.A. Ekdahl, K.B. Freese, R.F. Gribble, K.F. McKenna, G. Miller, R.E. Siemon, T.M. York	192
3P16	Multi-frequency Calculations of Radiation Output from Imploding Foil Liner Radiation Source, M.L. Alme, B.B. Rogers	167	4C9	Experiments with Solid End Plugs to Eliminate End Loss from the Scylla IV-P Theta Pinch, C.A. Ekdahl, R.R. Bartsch, R.J. Comisso, R.F. Gribble, K.B. Freese, K.F. McKenna, G. Miller, R.E. Siemon, T.M. York	193
3P17	Charged Particle Transport Using a Space and Time-Dependent Fokker-Planck Code, T.A. Mehlhorn and J.J. Duderstadt	168	4C10	Gas Electrodes for High-Intensity Z-Pinches, J.G. Linhart	194
	Tuesday, 16 May 1978, Afternoon		4C11	Tandem Mirror Hybrid Reactors Using Scaled 2XII B Plugs, B. G. Logan	195
	SESSION 4A: INTENSE ELECTRON AND ION BEAMS II Ion and Electron Beams for Inertial Confinement Fusion			Tuesday, 16 May 1978, Afternoon	
4A1-2	<u>Invited Paper.</u> Light Ion Beam Sources as a Driver for Inertial Confinement Fusion, Shyke A. Goldstein	169		SESSION 4D: LASER ISOTOPE SEPARATION	
4A3	Central Igniter Magnetic Targets with Voltage Shaping, M.A. Sweeney and A.V. Farnsworth, Jr.	170	4D1	Isotopically Selective IR Photodissociation of SeF <sub>6</sub> , Joe J. Tiee and C. Wittig	196
4A4	Fuel Preconditioning Studies for Electron Beam Fusion, J.N. Olson, M.M. Widner, L. Baker, and J. Chang	171	4D2	Photon Enhancement of Dissociative Electron Attachment and Its Isotopic Selectivities in SF <sub>6</sub> , C.L. Chen, P.J. Chantry	197
4A5	Temporal Light-Ion Current Measurements Using Neutron Time-Of-Flight, F.C. Young, S.J. Stephanakis and D. Mosher	172	4D3	A High Power KrF Laser Drive, Greg Hill, Walter Granberry, and T.R. Burkes	198
4A6	Beam Target Neutron Production in REB Diodes, R.J. Leeper, J. Chang, L.P. Mix	173	4D4	High Pressure Transverse Discharge UV Lasers: Excitation and Performance Characteristics, W.J. Sarjeant, A.J. Alcock, R.S. Taylor and K.E. Leopold	199
4A7	Calculations of Magnetically Insulated Ion Diodes, J.P. Quintenz, J.W. Poukey, and B.J. Johnson	174	4D5	Linac Lasers, C.A. Brau, T.R. Loree, S.D. Rockwood, W.E. Stein 200	
4A8	Initial Studies of a Magnetically Insulated Ion Diode, D.J. Johnson, G.W. Kuswa, R.J. Leeper, S. Humphries, Jr. G.R. Hadley	175			
4A9	A Spherically Focusing Magnetically Insulated Ion Diode, M. Greenspan, D. Hammer, and R.N. Sudan	176			

Paper	Page	Paper	Page
4D6-7	<u>Invited Paper</u> . Eximer Laser Development at LASL, C.A. Brau, A.I. Greene, P.N. Mace, W.L. Willis	200	
4D8	The Kinetron - An Ion Transporting Device, I. Alexeff, F. Hartmann, G. Nolde, T. Ress	201	
Tuesday, 16 May 1978, Afternoon			
SESSION 4E: ADVANCED FUEL TECHNOLOGY, MAGNETOFLUIDDYNAMICS			
4E1	The Use of a Hot Sheath Tormac for Advanced Fuels, M.A. Levine	202	
4E2	Design Study of a 120 kV Neutral <sup>3</sup> He Injector, A. Blum, B. Barr, W. Dexter, J. Fink, R. Moir, and T. Wilcox	203	
4E3	<sup>6</sup> Li + <sup>6</sup> Li Reactions in Advanced Fuel Fusion, Edwin Norbeck	204	
4E4	Synthesis of Trans-Uranics and Superheavy Elements In Fusion Reactors, Particularly Using the Laser-Pellet Technology, S.M. Ayub	205	
4E5-6	<u>Invited Paper</u> . Nuclear Microexplosion Futurology, F. Winterberg	206	
4E7	Energy Conversion with Bow-Shock Diodes, J. Kwan, B. Ahlborn, and F. Sanderson	207	
4E8	Radiofrequency Ionization Experiments with Helium Flow At Intermediate Pressures Using a Closed Loop MPD Facility, M.E. Talaat	208	
4E9	The MHD - Sheath Voltage Drop, Effects of Higher Currents, R.E. Ball, O. Biblarz	209	
4E10	The Stability of Magnetohydrodynamic Flow with Hall and Ion Slip Currents, M.L. Mittal, G.H. Masapati	210	
4E11	Hall and Ion-Slip Effects in MHD Couette Flow with Heat Transfer, V.M. Soundalgekar, H.S. Takhar	211	
Tuesday, 17 May 1978, Afternoon			
POSTER SESSION 4P: ENERGY STORAGE, MAGNETICS, FUSION REACTOR TECHNOLOGY, AND THERMIONICS AND PLASMA DIODES			
4P1	A 20 Megajoule Homopolar Generator System for Testing Pulsed Superconducting Magnets for Tokamak Ohmic Heating Startup Duty, W.L. Bird, W.F. Weldon, H.G. Rylander, H.H. Woodson	212	
4P2	Magnet Optimization for Pulsed Energy Conversion, W.K. Tucker, R.E. Wilcox, W.D. Markiewicz, E.C. Cnare, T. Petrovich, M.W. Dew	213	
4P3	A Newly Discovered Failure Mode in High Energy Density Energy Storage Capacitors, G.P. Boicourt and E.L. Kemp	214	
4P4	A Pulsed Alternator for Laser Flash Lamps, W.F. Weldon, M.D. Driga, H.H. Woodson, H.G. Rylander	215	
4P5	Testing and Analysis of a Fast Discharge Homopolar Machine (FDX), J.H. Gully, M.D. Driga, B. Grant, H.G. Rylander, K.M. Tolk, W.F. Weldon, H.H. Woodson, R. Zowarka	216	
4P6	Numerical Simulation of Compressed Magnetic Flux Pulse Power Generators, T.P. Wright, L. Baker, M. Cowan, J.R. Freeman	217	
4P7	Two and three Dimensional Electromagnetic Fields and Stress Calculations for Controlled Thermonuclear Fusion Systems, M.D. Driga, E.B. Becker, M.L. Soni, H.G. Rylander, W.F. Weldon, H.H. Woodson	218	
4P8	Expansion of a Plasma into a Finite Chamber, V. Bailey, O. Lopez, M. Di Capua	219	
4P9	Shock Heated Wall Confined Reactor Concept, O. Lopez, V. Bailey, M. Di Capua and R. Cooper	220	
4P10	Use of Plasma-Circuit Computer Code for Specification of Poloidal Field Power Supply Requirements for PHIBEX and RIGGATRON Tokamak Fusion Reactors, D.J.T. Mayhall, W.F. Weldon, H.H. Woodson, H.G. Rylander	221	
4P11	Two-Component Multiple-Mirror Reactor with Depressed Ion Temperature, S.T. Yang and M.A. Lieberman	222	
4P12	Plasma Burn Control in Fusion Reactors, Jay L. Fisher, Franklin R. Chang and Paul A. Madden	223	
4P13	Cesium oxide Formation During Cesium and Oxygen Codeposition on W(110), J-L. Desplat,	224	
Wednesday, 17 May 1978, Morning			
SESSION 5A: INTENSE ELECTRON AND ION BEAMS III Beam Transport, Laser Excitation Plasma Heating, Collective Acceleration			
5A1	Extraction of a Long-Pulsed Intense Electron Beam from a Pulsed Plasma Based on Hollow Cathode Discharge, Johshin Uramoto	225	
5A2	Advances in Intense Relativistic Electron Beam Characterization in B <sub>z</sub> Transport Systems, B. Ecker, V. Buck, T. Young, O. Lopez, B. Chao	226	
5A3	Relativistic Electron Beam Propagation in Low Density Neutral Gas, Barry S. Newberger,	227	
5A4	Current Instability in Electron Beam Diodes with Blade and Needle Cathodes, M.T. Buttram	228	
5A5	Two Cavity Operation of the Autoaccelerator, Thomas Lockner and Moshe Friedman	229	
5A6	Numerical Simulation of the FX-75 REB Accelerator, R.L. Copeland, and J.L. Adamski	230	
5A7	Collective Ion Acceleration in a Vacuum Diode, J.L. Adamski, R.L. Copeland, P.S.P. Wei, J.R. Beymer, R.L. Guay	231	
5A8	An Experimental Study of Luce Diode Phenomena, R.J. Adler and J.A. Nation	232	
5A9	Thermonuclear Microexplosion Ignition by Hypervelocity Projectiles, F. Winterberg	233	
5A10-11	<u>Invited Paper</u> . Heavy Ion Accelerators for Inertially Confined Fusion, W.B. Herrmannsfeldt	234	
5A12	Measurements of the Shape and Size of a Relativistic Nonneutral Electron Cloud Confined in a Magnetic Mirror, S. Eckhouse, A. Fisher, and N. Rostoker	235	
Wednesday, 17 May 1978, Morning			
SESSION 5B: COMPUTER APPLICATIONS TO PLASMA SCIENCE I			
5B1	Computer Assisted Neutral Beamline Operation, R.W. Stooksberry, H.P. Eubank	236	
5B2	Compaction Techniques for Large CTR Data Bases, W.F. Cummins	237	
5B3	Measurement and Control System for an Elmo Bumpy Torus, H. Myers	238	
5B4	A Data Acquisition and Control System for Laser Fusion Plasma Diagnostics, J.R. Greenwood, J.T. Ozawa, J.R. Severny, D.C. Campbell, S.L. Lacy	239	
5B5-6	<u>Invited Paper</u> . Computer Applications to Tokamak Research, Ray C. Grimm	240	
5B7	Three-Dimensional Simulation of Field Reversal in Mirrors with Neutral Injection, Dale E. Nielsen, Jr.	241	
5B8	Runaway Drag Due to the Excitation of Large Amplitude Electron Plasma Waves, J.N. Leboeuf, T. Tajima, G.J. Morales	242	
5B9	Simulation of Lower-Hybrid Heating of a Nonuniform Plasma, V.K. Decyk, J.M. Dawson, G.J. Morales	243	
5B10	Plasma Modeling with Discrete Particle Arrays, Edward P. Schelonka	244	
Wednesday, 17 May 1978, Morning			
SESSION 5C: FUSION REACTOR TECHNOLOGY			
5C1	The Effects of Plasma Characteristics on Fusion Reactors, Robert G. Mills	245	
5C2	Controls & Instrumentation for Tokamak Reactors, W.R. Becraft, W.A. Houlberg, and W.M. Stacey, Jr.	246	
5C3-4	<u>Invited Paper</u> . The Design and Construction of the JET Device, D. Eckhartt	248	
5C5	Torsatron Reactor Reference Design, L.M. Lidsky, P.A. Politzer, J.L. Shohet	249	
5C6	The Passive Liner Laser Reactor, G.C. Vlases	250	
5C7	Alpha-Particle Effects in Dense Linear Plasmas, Ronald L. Miller	251	
5C8	Preliminary Study of High Neutron Flux Fusion Heating, Richard L. Liboff	252	

Paper	Page	Paper	Page
5C9	Plasma Injection and Fueling By Means of Deflagration Guns, P.P. Tripathi, C.N.Chang, and Dah Yu Cheng	253	
5C10	Pellet Fueling in Tokamak Reactors, A.T. Mense, S.E. Attenberger, W.A. Houlberg, S.L. Milora	254	
5C11	A Large Solid Hydrogen Pellet Generator and Its Implications For Pellet Fueling Experiments on Tokamaks, R.P. Gilliard and K. Kim	255	
5C12	Laser Acceleration of Reactor-Fuel Pellets, F.S. Felber	256	
Wednesday, 17 May 1978, Morning			
SESSION 5D: PLASMA SCIENCE OF CIRCUIT INTERRUPTION, ARC TECHNOLOGY			
5D1-2	Invited Paper. Applications of Pulse Power Technology to Inertial Fusion, Glenn W. Kuswa	257	
5D3	Effects of Arc Induced Pressure Rise on Performance of Puffer-Type Circuit Breaker, A. Lee	258	
5D4	Arc-Free HV Interruption, W. Knauer, R.J. Harvey	259	
5D5	Development of High-Current DC Circuit Breakers for the Alcator Program, Stephen Fairfax, William Burke, Charles Park, Frank Silva	260	
5D6	Fast Opening Plasma Switch, Kenneth D. Bergeron, J. Pace VanDevender	261	
5D7	Active Circuit Elements For Use in Pulse Power Experiments, C.W. Mendel, Jr., S. Humphries, Jr.	262	
5D8	Plasma Microwave Diagnostic Studies of the Vacuum Arc, M. Rosenfeld, R. Dollinger, C.N. Manikopoulos	263	
5D9	Flow Field Within an Arc Plasma, A.S. Nat, D.P. Malone, D.M. Benenson	264	
5D10	A Three Parameter Model of an Ablation Stabilized Arc, M.D. Nahemow	265	
Wednesday, 17 May 1978, Morning			
POSTER SESSION 5P: PLASMAS FOR FUSION RESEARCH, MAGNETO-FLUIDDYNAMICS, AND GASEOUS ELECTRONICS			
5P1	ZT-40 Toroidal-Reversed-Field Pinch, M.D. Machalek	266	
5P2	Picket Fence Plasma Measurements, N. Hershkovitz, J.R. Smith	267	
5P3	Description of the Mirror Fusion Test Facility (MFTF), Gary D. Porter and James W. Shearer	268	
5P4	Control and Diagnostics System for the Mirror Fusion Test Facility, G.W. Leppelmeier, K.H. Pryor, and R.H. Wyman, Jr.	269	
5P5	Neutral Beam System for the Mirror Fusion Test Facility (MFTF), A.W. Molvik	270	
5P6	Laser Heating of Magnetized Wall Confined Plasma Columns, D.W. Scudder, Z.A. Pietrzyk, G.C. Vlases	271	
5P7	Functional Dependence of Radial Transport in a Toroidal Plasma Subject to Strong Radial Electric Fields, J. Reece Roth, Walter M. Krawczonek, Edward J. Powers, Jae Y. Hong and Young C. Kim	272	
5P8	Critical Beta and Experimental Scaling for Stellarators, J.L. Shohet, D.T. Anderson, J.H. Harris, J.N. Talmadge, L.M. Lidsky, P.A. Politzer	273	
5P9	Models for Reversed Field Configuration Induced by a Rotating Relativistic Electron Beam, J.D. Sethian, G.D. Goldenbaum	274	
5P10	Evolution of Toroidal High Beta Tokamak Equilibria, G.C. Goldenbaum	275	
5P11	Field Reversed Configuration Generated with Plasma Currents Induced by a Rotating Relativistic Electron Beam, K.A. Gerber, G.C. Goldenbaum, D.A. Hammer, A.E. Robson, J.D. Sethian and D.N. Spector	276	
5P12	Discharge Studies of the BNL H <sup>-</sup> Ion Sources, M.W. Grossman	277	
Wednesday, 17 May 1978, Afternoon			
SESSION 6A: INTENSE ELECTRON AND ION BEAMS IV Applications for Beam Injection, Ion Sources, Instabilities, Microwave Generation			
6A1	Observation of Superdense Megavolt Ion Beams In A Long-Pulse Magnetically Insulated Diode, S.C. Luckhardt, and H.H. Fleischmann	278	
6A2	Low Energy Ion Source Using Fine Mesh Extraction, J.T. Crow, A.T. Forrester and D.M. Goebel	279	
6A3	Magnetic Multipole Intense H <sup>+</sup> Ion Source, A.T. Forrester, D.M. Goebel and J.T. Crow	280	
6A4	LaB <sub>6</sub> Hollow Tube Cathode Operation in Ion Sources, D.M. Goebel, J.T. Crow and A.T. Forrester	281	
6A5	Space Charge Neutralization of Negative Ion Beams by Positive Ions: Influence of Parasitic Electrons, J.M. Dolique	282	
6A6-7	Invited Paper. Ion Injection for Mirror Machines, Daniel Prono	283	
6A8	Relativistic Streaming Instability Enhanced by Judicious Choice of External Magnetic Field Strength, Lester E. Thode	284	
6A9	Microwave Generation Due to Electron Beam Interactions In A Rippled Magnetic Field, G.F. Providakes, J.A. Nation	285	
6A10	Development of a Relativistic Magnetron, D.B. Illic, S.A. Self, and F.W. Crawford	286	
6A11	Equilibria and Stability of Centrifugal Relativistic Electron Beams, Gregory Benford	287	
6A12	Coherent Curvature Radiation from an Intense Relativistic Electron Beam Rotating in a Plasma, D. Tzach, C.W. Roberson, and G. Benford	288	
Wednesday, 17 May 1978, Afternoon			
SESSION 6B: COMPUTER APPLICATIONS TO PLASMA SCIENCE II			
6B1	Numerical Study of a High-Density Z-Pinch, T.A. Oliphant and J.H. Brownell	289	
6B2	Laser Heated Jet as a Plasma Source, L.J. Suter, I.R. Lindemuth and D. Schnack	290	
6B3	Multidimensional Magnetohydrodynamic Calculations, C. Finan and D. Schnack	291	
6B4-5	Invited Paper. Activities and Plans of the National Magnetic Fusion Energy Computer Center, John Killeen	292	
6B6	Numerical Study of Hydrodynamic Stability of Imploding Spherical Shells, Milt Chapman, J.L. Cook, Andrew Wilson	293	
6B7	Non-Linear Development of Taylor Instability in Ablatively Accelerated Shells, R. McCrory, R. Morse and C. Verdon	294	
6B8	Computations of Plasma Build-Up in Mirror Plasma Confinement Devices, R.S. Devoto, D.R. Faul, B.W. Stallard	295	
6B9	Algorithms for the Different Steps in the Numerical Solution of Partial Differential Equations and Application to the Design of an Ion Extraction System, J. Hauser, F. Tanzer	296	
6B10	Approximations for Parametric Oscillations in Finite Inhomogeneous Plasmas, F.T. Adler, R.R. Peterson	297	
Wednesday, 17 May 1978, Afternoon			
SESSION 6C: PLASMA HEATING			
6C1	The Neutron Deduced Ion Temperature in Beam Heated PLT Discharges, J.D. Strachan and S. Davis	298	
6C2	An Assessment of Neutral Injection for TNS, W.R. Becraft	299	
6C3-4	Invited Paper. Neutral Beam Heating Results on PLT, H.P. Eubank	300	
6C5	ECRF Heating in Tokamaks, H. Hsuan, V. Arunasalam, K. Bol, P.C. Efthimion, R.A. Ellis, J.C. Hosea, R.W. Motley, and F.W. Perkins	301	
6C6	A High Power 35 GHz Microwave Source for ECRH, M. Read, L. Sefor, R. Lucey, K.R. Chu, J.D. Silverstein, and V.L. Granatstein	302	
6C7	Coupling Efficiency to the Fast Alfvén Resonances In the Microtor and Macrotor Tokamaks, G.J. Morales and R.J. Taylor	303	

Paper		Page
6C8	Diffusion, Acceleration and Heating of a Plasma in a Stochastic Magnetic Field, M.L. Mittal, Y.S. Prahald and D.G. Nayak	304
6C9	Techniques for Plasma Compression by Imploding Liquid Liners, R.L. Burton, P.J. Turchi, D.J. Jenkins, D.L. Book, and A.L. Cooper	305
6C10	System Performance of a Plasma Focus Powered by a Small Explosive Generator, B.L. Freeman, W.B. Garn, R.S. Caird, D.J. Erickson and C.M. Fowler	306
6C11	Some Observations on Ion Acceleration from Image Structures of a 2 kJ Plasma Focus, Heinz Fischer, K.H. Häring and R. Klemm	307

Wednesday, 17 May 1978, Afternoon

SESSION 6D: GASEOUS ELECTRONICS

6D1-2	Invited Paper. Closed-Cycle Laser Technology: A Status Report, Robert A. Olson, Alan Garscadden, Peter Bletzinger	308
6D3	Effects of Closed Cycle CO <sub>2</sub> Electric Discharge Laser Gas Contamination, Jürgen Thoenes, Shelby C. Kurzius, Charles M. Cason	309
6D4	Generation of Spatially Uniform, Long Pulse Discharge Excitation in High Pressure Gases, Robert J.L. Chimentí and Abraham Kasdan	310
6D5	Nonequilibrium Electron Kinetics in the Cathode Region of a Glow Discharge, William H. Long, Jr.	311
6D6	Electron Switched Laser Systems, William M. Hughes	312
6D7	A Re-Examination of the Classical Solution to the Positive Column of a Glow Discharge, O. Biblarz	313
6D8	On the Distribution of the Particles in the Weakly Ionized Gas, S.V. Temko, S.K. Kuzmin	314
6D9	Investigations of RF-Generated Low Pressure Plasmas as Particle Sources for Fusion Plasma Heating, Dr. R. Walther	315
6D10	The Electrical Conductivity of MHD Plasma - The Effect of Uncertainty in Electron-Scattering Cross Sections, J.R. Rumble, Jr., and L. Pitchford	316
6D11	Ionization Path Formation in Gases Using a Laser With Retractable Focus, Guy M. Weyl	317
6D12	Cylindrical Microwave Cavity Electrically Loaded With a Propagating Flame-Front Plasma - Theory and Experiment, M.A.V. Ward, D. Preis, F.R. Kern, Jr.	318

Paper		Page
Wednesday, 17 May 1978, Afternoon		
POSTER SESSION 6P: PLASMA WAVES, INSTABILITIES, AND ANTENNAS, PLASMA SCIENCE OF CIRCUIT INTERRUPTION, ARC TECHNOLOGY, AND PLASMA FOCUS.		

6P1	The Continuous Eigenvalue Spectrum for Alfvén Waves in Non-Axisymmetric Devices, J.A. Tataronis, J.N. Talmadge, J.L. Shohet	319
6P2	Current-Driven Modes in High- $\beta$ Tokamak, D.K. Bhadra, J.L. Sperling	320
6P3	Reduction of Anomalous Plasma Losses due to Large-Amplitude Drift Dissipative Instabilities by Dynamic Stabilization, S.Q. Mah, C. Boucher, J. Teichmann and H.W.H. Van Andel	321
6P4	Resistive Lower-Hybrid and Ion-Ion-Hybrid Instabilities in Current-Carrying Plasmas, Kai Fong Lee, Louis W.M. Chu	322
6P5	Resonance Scattering of Two Dimensional Soliton, Y. Nishida and T. Nagasawa	323
6P6	A Modified KdV Equation for the NL Slow Alfvén Waves, W. Malfliet	324
6P7	Threshold Behavior of the Three-wave Parametric-Decay Interaction in Bounded Inhomogeneous Plasmas, V. Fuchs, G. Beaudry, and M.M. Shoucri	325
6P8	Application of Digital Complex Demodulation Techniques in Analyzing Nonlinear Wave Data, Young C. Kim, Edward J. Powers	326
6P9	Experimental Technique of Arc Gap Recovery Measurements, J.V.R. Heberlein, A. Lee, T.N. Meyer	327
6P10	Absorption of CO <sub>2</sub> Laser Light and Enhancement of Hydro-magnetic Oscillation and Neutron Yield in a Plasma Focus, Y. Kitagawa, Y. Yamada, A. Thein, C. Yamanaka	328
6P11	Electrodynamics and X-Ray Emission of a 60 KV Plasma Focus, D.C. Gates.	329
6P12	An Explosive Driven Power Source for Plasma Focus Experiments, R.S. Caird, W.B. Garn, B.L. Freeman, D.J. Erickson and C.M. Fowler	330