

Fusiontechnology™

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PART 2A (pp. 479–1062)

PART 2B (pp. 1063–1658)

**Proceedings of the
SEVENTH TOPICAL MEETING ON THE TECHNOLOGY
OF FUSION ENERGY
(Reno, Nevada, June 15–19, 1986)**

- xiii** Comments / *George Miley*
- xv** In Memory of Noel Amherd
- xvii** Preface: Seventh Topical Meeting on the Technology of Fusion Energy /
Carl D. Henning

THE COMPACT IGNITION TOKAMAK PROGRAM

- 481** Physics Guidelines for the Compact Ignition Tokamak / *J. Sheffield, R. A. Dory, W. A. Houlberg, N. A. Uckan, M. Bell, P. Colestock, J. Hosea, S. Kaye, M. Petravic, D. Post, S. D. Scott, K. M. Young, K. H. Burrell, N. Ohyabu, R. Stambaugh, M. Greenwald, P. Liewer, D. Ross, C. Singer, H. Weitzner*
- 491** Overview of the Compact Ignition Tokamak / *C. A. Flanagan, T. G. Brown, W. R. Hamilton, V. D. Lee, Y-K. M. Peng, T. E. Shannon, P. T. Spampinato, J. J. Yugo, D. B. Montgomery, L. Bromberg, D. Cohn, R. M. Thome, John C. Commander, Robert H. Wyman, J. A. Schmidt, C. W. Bushnell, J. C. Citrolo, R. B. Fleming, D. Huttar, D. Post, Jr., K. Young, F. A. Puhn, R. Gallix, E. R. Hager, J. R. Bartlit, D. W. Swain*
- 498** System Studies of Compact Ignition Tokamaks / *J. D. Galambos, Y-K. M. Peng, D. T. Blackfield*
- 504** PF Coil System Comparisons for a Compact Ignition Device / *R. D. Pillsbury, Jr., J. H. Schultz, R. J. Thome*
- 508** Configuration Development and Structural Assessment of the FEDC Ignitor Concept / *T. G. Brown, V. D. Lee, J. A. Mayhall*
- 514** First-Wall and Vacuum Vessel Analysis for Compact Ignition Tokamaks / *G. Listvinsky, J. J. Weede, S. L. Salem, A. Wolfson*
- 521** Liquid Nitrogen Cooling Considerations of the Compact Ignition Tokamak / *A. E. Dabiri*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

- 527 Maintainability Features of the Compact Ignition Tokamak / *P. T. Spampinato, C. W. Bushnell*
- 533 Rotating Shield Ceiling for the Compact Ignition Tokamak Test Cell / *J. C. Commander*

FUSION NUCLEONICS EXPERIMENTS

- 541 Summary of Recent Results from the JAERI/U.S. Fusion Neutronics Phase I Experiments / *T. Nakamura, M. A. Abdou*
- 549 Analyses and Intercomparison for Phase I Fusion Integral Experiments at the FNS Facility / *M. Z. Youssef, C. Gung, M. Nakagawa, T. Mori, K. Kosako, T. Nakamura*
- 564 Measured Neutron Parameters for Phase I Experiments at the FNS Facility / *H. Maekawa, T. Nakamura, Y. Oyama, Y. Ikeda, S. Yamaguchi, K. Tsuda, K. Oishi, K. G. Porges, E. F. Bennett, T. J. Yule, G. J. Di Iorio*
- 573 Tritium Production Measurements by the Lithium-Glass Scintillator Method / *S. Yamaguchi, T. Nakamura*
- 579 Experiment and Analysis of Induced Activities in Concrete Irradiated by 14-MeV Neutrons / *K. Oishi, Y. Ikeda, C. Konno, H. Maekawa, T. Nakamura*
- 585 Neutron Field Characteristics in a Concrete Cavity Having a DT Neutron Source / *Y. Oyama, Y. Ikeda, T. Mori, M. Nakagawa, T. Nakamura, H. Maekawa*
- 591 TFTR Basement Radiation Fluence Calculations and Comparisons with Measurements / *S. L. Liew, L. P. Ku, J. G. Kolibal*

BLANKET DESIGN AND EVALUATION

- 599 Status of Fusion Reactor Blanket Design / *D. L. Smith, D-K. Sze*
- 609 Thin Blanket Design for MINIMARS—A Compact Tandem Mirror Fusion Reactor / *I. N. Sviatoslavsky, M. E. Sawan, L. A. El-Guebaly, L. J. Wittenberg, M. L. Corradini, W. F. Vogelsang, G. L. Kulcinski*
- 615 An Inherently Safe Tandem Mirror Fusion Blanket Concept / *J. K. Garner, C. F. Carson, J. D. Gordon, R. H. Whitley*
- 619 Helium-Cooled, FLiBe-Breeder, Beryllium-Multiplier Blanket for MINIMARS / *R. W. Moir, J. D. Lee*
- 624 Conceptual Design of a Self-Cooled FLiBe Blanket / *D-K. Sze, J. Jung, E. T. Cheng, S. Piet, A. Klein*
- 633 Thin Blanket Designs for the Elongated Tokamak Commercial Reactor / *C. P. C. Wong, R. F. Bourque, E. T. Cheng, R. L. Creedon, K. R. Schultz*
- 641 Applications of the Aqueous Self-Cooled Blanket Concept / *D. Steiner, M. J. Embrechts, G. Varsamis, K. Wrisley, L. Deutsch, P. Gierszewski*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3 PARTS 2A and 2B

(Continued)

INERTIAL CONFINEMENT FUSION DRIVER TECHNOLOGY

- 649 ICF Drivers: A Comparison of Some New Entries and Old Standbys / *W. J. Hogan*
- 656 Improved Shielding Calculations for the Particle Beam Fusion Accelerator PBFA II / *M. A. Sweeney, J. A. Halbleib, K. M. Tolk*
- 664 Ion Beam Trapping in Plasma Channels for Light Ion Inertial Confinement Fusion / *J. J. Watrous, R. E. Olson*
- 674 Conceptual Design of a Large E-Beam-Pumped KrF Laser for ICF Commercial Applications / *D. B. Harris, L. M. Waganer, D. S. Zuckerman, D. A. Bowers*
- 677 Conceptual Design of a Hybrid KrF Laser System for ICF Commercial Applications / *D. B. Harris, D. D. Lowenthal*
- 679 The Compact Torus Accelerator A Driver for ICF / *M. T. Tobin, W. R. Meier, E. C. Morse*
- 686 Initiation of Long Electrical Discharges in Dense ICF Reactor Atmospheres / *H. Kislev, B. J. Micklich*

FUSION REACTOR DESIGN—I

- 695 TURBOSTAR: An ICF Reactor Using Both Direct and Thermal Power Conversion / *J. H. Pitts*
- 704 International Tokamak Reactor (INTOR) / *W. M. Stacey, Jr.*
- 709 Tokamak Power Systems Studies at ANL / *C. C. Baker, D. A. Ehst, J. N. Brooks, K. Evans, Jr.*

FUSION MATERIALS—RADIATION EFFECTS AND ACTIVATION

- 719 Radiation Effects on Structural Ceramics in Fusion / *G. R. Hopkins, R. J. Price, P. W. Trester*
- 728 Recent Progress in Subsize Charpy Impact Specimen Testing for Fusion Reactor Materials Development / *G. E. Lucas, G. R. Odette, J. W. Shekherd, M. R. Krishnadev*
- 734 Incorporating Plastic Collapse into the Linear Elastic Fracture Mechanics Methodology in Determining Crack Propagation Lifetimes / *B. B. Glasgow, W. G. Wolfer*
- 741 Superconducting Magnet Radiation Effects in Fusion Reactors / *M. E. Sawan, P. L. Walstrom*
- 747 FLiBe-Vanadium Alloy System Corrosion Product Radiation Hazards Analysis / *A. C. Klein, D-K. Sze*
- 753 Analysis and Experiments on Lifetime Predictions for First Wall and Divertor Plate Structures in JAERI / *T. Horie, M. Seki, A. Minato, T. Tone*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

IMPURITY CONTROL

- 761 Pump Limiter Experiments and Engineering / *D. M. Goebel*
- 770 A Model for First-Wall Thermal Response to Plasma Energy Deposition / *M. C. Carroll, G. H. Miley*
- 776 Design Window for Liquid-Metal-Cooled Limiters / *A. Majid, M. A. Abdou*
- 782 Fusion Surface Material Melting, Ablation, and Ejection Under High Heat Loading / *M. R. Holliday, J. M. Doster, J. G. Gilligan*
- 789 Evaluation of Horizontal Cooling Channels for Actively Cooled Limiters / *J. A. Koski, J. B. Whitley*
- 795 Development of a High Vacuum, High Temperature Movable Limiter Support / *G. W. Brown*
- 802 TFTR Neutral Beam Magnet Analysis / *D. I. Brown, J. M. Tarrh*

LIQUID-METAL BLANKETS AND MAGNETOHYDRODYNAMIC EFFECTS

- 813 Techniques for Measurement of Velocity in Liquid-Metal MHD Flows / *C. B. Reed, B. F. Picologlou, P. V. Dauzvardis, J. L. Bailey*
- 822 Turbulence and the Feasibility of Self-Cooled Liquid Metal Blankets for Fusion Reactors / *H. Branover, S. Sukoriansky, G. Talmage, E. Greenspan*
- 830 Magneto-Hydro-Dynamic Pressure Drop of Lithium Flow in Rectangular Ducts / *K. Miyazaki, S. Inoue, N. Yamaoka, T. Horiba, K. Yokomizo*
- 837 Uncertainties in Liquid Metal Fusion Blanket Design Windows / *J. K. Garner, M. A. Abdou*
- 848 Lithium-Cooled Blankets for Advanced Tokamaks / *B. F. Picologlou, Y. S. Cha, S. Majumdar*
- 854 Entry Length Effects in Liquid-Metal Fusion Blankets / *A. H. Hadid*
- 860 Experimental and Analytical Investigations of Magnetohydrodynamic Flows Near the Entrance to a Strong Magnetic Field / *B. F. Picologlou, C. B. Reed, P. V. Dauzvardis, J. S. Walker*
- 866 Comparison of Three MHD Flow Control Methods for Self-Cooled Liquid Metal Blankets / *J. S. Walker, B. F. Picologlou*

INNOVATIVE CONCEPTS FOR POWER CONVERSION

- 875 IPFR, Integrated Pool Fusion Reactor Concept / *D-K. Sze*
- 881 In-Situ MHD Energy Conversion for Fusion / *R. B. Campbell, B. G. Logan, M. A. Hoffman*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

- 890 Applications of the Integrated-Blanket-Coil Concept to the Compact Reversed-Field Pinch Reactor / *W. P. Duggan, D. Steiner, M. J. Embrechts*
- 896 Common Views of Potentially Attractive Fusion Concepts / *S. J. Piet*
- 902 An Evaluation of Polarized Fuels in a Commercial Deuterium-Tritium Tokamak Reactor / *P. A. Finn, J. N. Brooks, D. A. Ehst, Y. Gohar, R. F. Mattas, C. C. Baker*
- 908 Direct Converter Design for the MINIMARS Tandem Mirror Reactor / *T. E. Luzzi, I. R. Clarkson*
- 914 Liquid Metal MHD Energy Conversion in Fusion Reactors / *L. Blumenau, H. Branover, A. El-Boher, E. Spero, S. Sukoriansky, G. Talmage, E. Greenspan*

LITHIUM BLANKET MODULE PROGRAM AT THE LOTUS NEUTRON SOURCE FACILITY

- 925 Overview of the TFTR Lithium Blanket Module Program / *D. L. Jassby*
- 931 Experimental Program at the LOTUS Facility / *P-A. Haldy, A. Kumar, C. Sahraoui, S. Azam, D. V. S. Ramakrishna, J-P. Schneeberger, F. Tsang, L. Green*
- 940 Analysis of the LBM Experiments at LOTUS / *J. Stepenek, C. E. Higgs, S. Pelloni, J. W. Davidson, D. J. Dudziak*
- 952 The LBM Program at the EPFL/LOTUS Facility / *J. File, D. L. Jassby, F. Y. Tsang, P-A. Haldy, W. R. Leo, G. Woodruff*
- 958 The Neutronic Analysis for the LBM/LOTUS Experiment / *J. G. Kolibal, L. P. Ku, S. L. Liew*
- 962 Lithium Blanket Module (LBM) Dosimetry Measurements at the LOTUS 14-MeV Neutron Source Facility / *F. Y. Tsang, W. Leo, C. Sahraoui, S. Wuthrich, M. Shaer*
- 972 Tritium Assay of Li_2O in the LBM/LOTUS Experiments / *J. Quanci, S. Azam, P. Bertone*
- 978 A Comparative Study of Tritium Breeding Calculations Using JEF-1 and ENDF/B-V Based Nuclear Data Libraries / *E. T. Cheng, S. Pelloni*

FUSION MATERIALS—PROPERTIES AND BEHAVIOR

- 985 Thermodynamic Performance of Ceramic Tritium Breeding Blanket Material / *C. E. Johnson, A. K. Fischer*
- 990 The Chemistry of Molten Li_2BeF_4 / *E. M. Larsen, L. J. Wittenberg*
- 995 Initial Corrosion Evaluation of Zirconium Alloy Candidate Materials for the ASCB Concept / *W. F. Bogaerts, M. J. Embrechts, D. Steiner, L. Deutsch, P. Gierszewski*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3 PARTS 2A and 2B

(Continued)

- 1000 First Wall Tile Attachment Using Carbon-Carbon Composite Fittings / *G. R. Lutz, W. L. Tarasen*
- 1006 In-Vacuum Cyclic Fatigue Behavior of Vanstar-7 at Elevated Temperatures / *K. C. Liu*

PLASMA HEATING AND SYSTEM DYNAMICS

- 1015 Status of ICRF Heating of Tokamaks / *J. R. Wilson*
- 1024 A Folded Waveguide Coupler for Ion Cyclotron Heating / *T. L. Owens, G. L. Chen*
- 1030 Free Electron Masers for Tokamak Applications / *C. E. Wagner, H. Boehmer, M. Z. Caponi*
- 1034 Design Study and Supporting Experiments for an Axially Symmetric Anchor for a Tandem Mirror / *J. F. Kunze, M. A. Prelas, T. J. Dolan, P. Bennett, J. M. Freeman, L. Haynes, J. L. Hwang, S. D. McGhee, R. Roberts*
- 1041 Experimental Observation of the Dynamic Response of JT-60 Vacuum Vessel / *H. Takatsu, M. Shimizu, M. Ohkubo*
- 1047 Experimental Modelling of Eddy Currents and Deflection for Tokamak Limiters / *T. Q. Hua, M. J. Knott, L. R. Turner, R. B. Wehrle*
- 1053 Measurements of Reactor-Relevant Electromagnetic Effects with the FELIX Facility / *L. R. Turner, T. Q. Hua, M. J. Knott, S. Y. Lee, D. G. McGhee, R. B. Wehrle*
- 1059 TFTR Poloidal Coil Fault Analysis / *M. Pelovitz*

NUCLEAR TECHNOLOGY EXPERIMENTS AND FACILITIES

- 1065 Technical Requirements of Experiments and Facilities for Fusion Nuclear Technology / *M. Abdou, P. Gierszewski, M. Tillack, J. Grover, R. Puigh, D-K. Sze, D. Berwald*
- 1079 TIBER II—An Upgraded Tokamak Ignition/Burn Experimental Reactor / *C. D. Henning, B. G. Logan, L. J. Perkins, W. L. Barr, R. H. Bulmer, R. S. Devoto, J. N. Doggett, B. M. Johnston, J. D. Lee, J. R. Miller, W. S. Neef, D. S. Slack, L. Summers, M. Fenstermacher, G. Listvinsky, C. E. Wagner, M. Sawan*
- 1088 Required Momentum, Heat, and Mass Transport Experiments for Liquid Metal Blankets / *M. S. Tillack, D-K. Sze, M. A. Abdou*
- 1097 Fission Reactor Experiments for Solid Breeder Blankets / *P. J. Gierszewski, M. A. Abdou, R. Puigh*
- 1102 The Physical and Engineering Aspects of Fusion Engineering Test Facility Based on Mirror Confinement (FEF) / *T. Kawabe, S. Hirayama, Y. Kozaki, K. Yoshikawa, N. Asami, Y. Fukai, K. Hattori, H. Hojo, T. Honda, H. Ida,*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

T. Kitajima, S. Koda, K. Komatsu, R. Kumazawa, F. Matsuoka, T. Miyasugi, N. Morino, H. Nakashima, H. Nakata, S. Sato, Y. Uede, T. Watanabe, M. Yamada, Y. Yamamoto, H. Yamato

- 1111** Super High Field Ohmically Heated Tokamak Operation / *D. R. Cohn, L. Bromberg, R. J. LeClaire, R. E. Potok, D. L. Jassby*
- 1117** Compact Fusion Engineering Research Facility Based upon the LITE Concept / *C. E. Wagner, D. Berwald, G. Listvinsky*
- 1123** Issues and Test Requirements in Radiation Shielding of Fusion Reactors / *M. Nakagawa, M. A. Abdou*

FUSION REACTOR DESIGN—II

- 1133** The Influence of Reactor Operations on the Design and Performance of Tokamaks with Solid-Breeder Blankets / *N. M. Ghoniem, M. A. Firestone, R. W. Conn*
- 1146** The Final Version of MINIMARS—An Engineering View / *W. D. Nelson, D. C. Lousteau, J. N. Doggett, MINIMARS Team*
- 1153** Advanced Tokamak Reactors Based on the Spherical Torus (ATR/ST) / *R. L. Miller, R. A. Krakowski, C. G. Bathke, C. Copenhaver, N. M. Schnurr, A. G. Engelhardt, T. J. Seed, R. M. Zubrin*
- 1159** Fusion Reactor Options and Alternatives for the RFP / *R. L. Miller, R. A. Krakowski, C. G. Bathke, K. A. Werley, R. L. Hagenson*
- 1165** An Assessment of Multiplexed Deployment of Advanced Commercial Tokamaks / *R. H. Whitley, G. R. Lutz, S. A. Frieje, D. H. Berwald, J. D. Gordon*
- 1171** An Alpha Particle Distribution Function for Mirror Loss-Cone Type Instability Calculations / *S. K. Ho, G. R. Smith, W. M. Nevins, G. H. Miley*
- 1177** Determination of Gross Plasma Equilibrium from Magnetic Multipoles / *C. E. Kessel, M. A. Firestone*

ENVIRONMENT AND SAFETY

- 1185** Safety Guidelines for the Design of Next-Generation Tokamak Fusion Machines / *W. Redpath*
- 1191** Inherent/Passive Safety for Fusion / *S. J. Piet*
- 1197** Fusion Blanket Inherent Safety Assessment / *D-K. Sze, J. Jung, E. T. Cheng*
- 1205** Passive Decay Heat Removal in Liquid-Metal Cooled Reactors / *B. Malinovic, M. Kazimi*
- 1211** Some Safety Considerations of Liquid Lithium as a Fusion Breeder Material / *D. W. Jeppson, L. D. Muhlestein*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3 PARTS 2A and 2B

(Continued)

- 1216** Survey of Selected Magnet Failures and Accidents / *R. J. Thome, J. B. Czirr, J. H. Schultz*
- 1223** Contamination of Aluminum and Painted Surfaces Exposed to Tritium / *R. A. Jalbert, S. J. Brereton, D. F. Holland*
- 1228** Laser Generation of Particles to Simulate Aerosols from Fusion Systems / *M. D. Hoover, M. D. Allen, R. B. Simpson, H. C. Yeh*
- 1234** TFTR Offsite Dose Levels from Fusion Radiation and Effluent Releases / *J. Kolibal, L. P. Ku, S. L. Liew*

INERTIAL CONFINEMENT FUSION TARGET AND REACTION CHAMBER TECHNOLOGY

- 1243** Heavy-Ion Fusion Target Cost Model / *J. H. Pendergrass, D. B. Harris, D. J. Dudziak, K. W. Billman*
- 1245** Improved Understanding of First-Wall Vaporization/Condensation in Inertial Confinement Fusion Reactors / *C. D. Orth*
- 1251** Scaling of Vaporization and Condensation in Heavy Ion Fusion Reactors / *R. R. Peterson*
- 1253** Numerical Simulation of an ICF Target Explosion in a Stratified Gas Atmosphere / *T. J. Bartel, R. R. Peterson, G. A. Moses*
- 1259** MHD Energy Conversion with Advanced-Fuel Ion Beam Fusion / *G. H. Miley*
- 1264** Liquid Momentum Removal Using Rod Arrays Applied to the HYLIFE ICF Reactor / *A. R. Raffray, M. A. Hoffman*
- 1270** A Fiber Sensor Neutron Streak Camera for ICF Diagnostics / *H. Kislev, G. H. Miley*

FUSION APPLICATIONS

- 1279** The Fusion Applications Study—"FAME" / *K. R. Schultz, B. A. Engholm, R. F. Bourque, E. T. Cheng, M. J. Schaffer, C. P. C. Wong*
- 1290** Radioisotope Production in Fusion Reactors / *B. A. Engholm, E. T. Cheng, K. R. Schultz*
- 1297** Cm-244 as Multiplier and Breeder in a THO₂ Hybrid Blanket Driven by a (D,T) Source / *S. Şahin, T. A. Al-Kusayer*
- 1303** Coolant and Solid Breeder Significance in Fusion-Fission Blanket Performance / *J. M. Perlado*
- 1309** Nuclear Performance Optimization of the Molten-Salt Fusion Breeder / *J. D. Lee, B. R. Bandini*
- 1315** Neutronic Parameters of a Cylindrical Hybrid Blanket Driven by a Simulated Line Source / *S. Şahin, M. A. Raouf*
- 1321** Tritium Breeding in Hybrid Reactors / *M. Piera, J. M. Martinez-Val*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

TRITIUM TECHNOLOGY

- 1329** Tritium Technology Studies at the Tritium Systems Test Assembly / *J. L. Anderson, J. R. Bartlit*
- 1334** Residual Tritiated Water in Molecular Sieves / *J. E. Nasise, R. V. Carlson, R. A. Jalbert*
- 1340** An Experimental Evaluation of a Small Fusion Fuel Cleanup System / *W. J. Holtslander, R. E. Johnson, F. B. Gravelle, C. M. Shultz*
- 1345** Process to Recover Tritium from Fusion Fuel Cycle Impurities / *R.-D. Penzhorn, M. Glugla*
- 1349** A Discriminating Tritium Monitor Engineered for Tritium Handling Facility Applications / *E. C. Davey, R. T. Faught*
- 1355** The Tritium System for a Tokamak with a Self-Pumped Limiter / *A. M. A. M. Hassanein, D-K. Sze*
- 1362** A Process to Recover Tritium from High Pressure Helium / *P. A. Finn, D-K. Sze*
- 1367** Water Detritiation for Present and Future Fusion Plants / *M. L. Rogers*

MACHINE UPGRADES AND NEXT-GENERATION DEVICES

- 1375** The JET Technical and Scientific Performance and Future Plans / *P. L. Mondino, E. Bertolini, JET Team*
- 1386** Main Features Implemented in the JET Facility for Deuterium-Tritium Operation / *M. Huguet, E. Bertolini*
- 1398** The Technology of the Upgraded JET ICRF Heating System / *T. J. Wade, A. S. Kaye, J. Jacquinet*
- 1404** Demountable Toroidal Fusion Core Facility for Toroidal Physics Optimization and Fusion Engineering Research / *S. L. Bogart, C. E. Wagner, N. A. Krall, S. Sedehi, C. F. Weggel, J. A. Dalessandro, T. J. Seed, K. O. Lund*
- 1412** Deuterium-Driven D-T Fusion Reactor Test Facility / *R. E. Price, G. W. Shuy, J. T. Woo*
- 1418** Analytical Study of Power Grid Pulsing / *G. Bronner*

HEAVY-ION FUSION SYSTEMS ASSESSMENT

- 1423** Heavy-Ion Fusion: Setting the Stage / *W. B. Herrmannsfeldt*
- 1424** A Comparison of the Design and Costs of Induction Linac Drivers for Inertial Fusion Using Ions of Mass 133 and 200 / *J. Hovingh, V. O. Brady, A. Faltens, E. P. Lee*
- 1427** Gain Scaling Relations for Heavy-Ion Targets / *G. R. Magelssen*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3 PARTS 2A and 2B

(Continued)

- 1429** Targets for Heavy Ion Fusion / *R. O. Bangerter*
- 1431** Reactor Designs for Heavy-Ion Fusion / *J. H. Pendergrass, W. R. Meier*
- 1433** Heavy Ion Beam Transport in ICF Reaction Chambers / *P. Stroud*
- 1435** A Systems Performance and Cost Model for Heavy Ion Fusion / *D. S. Zuckerman, D. E. Driemeyer, L. M. Waganer*
- 1437** Heavy Ion Fusion Systems Assessment—An Overview / *L. M. Waganer, D. E. Driemeyer, D. S. Zuckerman, K. W. Billman*
- 1438** Heavy-Ion Fusion: Future Promise and Future Directions / *D. J. Dudziak, W. W. Saylor, J. H. Pendergrass*

FUSION NUCLEONICS

- 1443** Neutronics Analysis for Aqueous Self-Cooled Fusion Reactor Blankets / *M. J. Embrechts, G. Varsamis, R. Jaffa, D. Steiner, L. Deutsch, P. Gierszewski*
- 1449** Trade-Off Study of Liquid Metal Self-Cooled Blankets / *Y. Gohar*
- 1456** A Thin LiPb/Be Helium Cooled Blanket for MINIMARS: Neutronics Analysis / *L. A. El-Guebaly*
- 1461** COVFILS-2: Neutron Data and Covariances for Sensitivity and Uncertainty Analysis / *D. W. Muir*
- 1466** U.S./JAERI Computational Benchmarks for Nuclear Data and Codes Inter-comparison / *M. Youssef, J. Jung, M. Sawan, M. Nakagawa, T. Mori, K. Kosako*
- 1477** Fast and Intermediate Energy Neutron Albedos for Fusion Materials / *B. J. Micklich*
- 1483** Geometrical, Spectral and Temporal Differences Between ICF and MCF Reactors and Their Impact of Blanket Nuclear Parameters / *M. E. Sawan*
- 1489** Low Activation Studies Considering Candidate Steels. Computational Procedure and Evaluation / *P. Hernán, J. M. Perlado, J. M. Santolaya, J. Sanz*
- 1495** Activation Analysis of the Compact Ignition Tokamak / *E. C. Selcow*

MAGNET ENGINEERING

- 1503** High Field Superconducting Magnets (12 T and Greater) for Fusion Applications / *J. R. Miller, L. T. Summers, J. A. Kerns*
- 1513** A 16-T Superconducting Toroidal Coil Development for a Tokamak Fusion Machine / *M. Nishi, T. Ando, Y. Takahashi, T. Hiyama, K. Kawano, M. Oshikiri, S. Shimamoto*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3

PARTS 2A and 2B

(Continued)

- 1518** Design Selections for the Fabrication of the Demonstration Poloidal Coil / *H. Tsuji, K. Yoshida, T. Ando, Y. Takahashi, M. Nishi, E. Tada, K. Koizumi, K. Okuno, H. Nakajima, T. Kato, Y. Ohgane, E. Yaguchi, S. Shimamoto*
- 1524** MINIMARS Choke Coil Design / *H. Gurol, J. F. Parmer, J. E. Burgeson, S. D. Peck, M. H. Hilal, T. A. Mancuso, K. L. Agarwal, E. N. Dalder*
- 1530** Cryogenic System Component Development for Fusion Experimental Reactor at JAERI / *T. Kato, S. Kamiya, E. Tada, T. Hiyama, K. Kawano, S. Shimamoto*
- 1536** Sliding Joint and Bond Development Program for the Alcator C-Mod Toroidal Field Coils / *W. K. Beck, H. D. Becker, M. M. Besen, D. A. Gwinn, D. B. Montgomery, N. T. Pierce, R. D. Pillsbury, J. H. Schultz*
- 1542** The Differential Geometry of Twisted Coil Windings / *P. L. Walstrom*
- 1548** Stability and Vibration of Internal Windings of Superconducting Solenoid Magnets / *K. Hara, F. C. Moon*

FUSION ECONOMICS

- 1557** A Standard Method for Economic Analyses of Inertial Confinement Fusion Power Plants / *W. R. Meier*
- 1565** SAFIRE—A Systems Analysis Code for Inertial Fusion Economics / *T. J. McCarville, C. F. Carson, B. B. Glasgow, W. R. Meier*
- 1571** Economic Comparison of Fusion Power Plant Designs / *J. E. O'Neill*
- 1577** Cost Study of the ESPRESSO Blanket for a Tandem Mirror Reactor / *A. R. Raffray, M. A. Hoffman, T. Gaskins*
- 1583** Figure of Merit of Magnetic Fusion Reactor / *Y. Kazawa*
- 1590** Three-State Model for Fusion Reactor Plant Availability Analysis / *Y. Watanabe, C. W. Maynard, Z. Musicki*
- 1596** Data Base for Failure/Maintenance at the Tritium Systems Test Assembly / *K. M. Gruetzmacher, R. C. Wilhelm*

SOLID BREEDER BLANKETS

- 1605** Neutronic Optimization of $\text{Li}_4\text{SiO}_4/\text{Be}/\text{He}/\text{SS}$ Blankets and Shields for the NET / *E. Greenspan, Y. Karni*
- 1611** First-Wall Structural Analysis of the Aqueous Self-Cooled Blanket Concept / *D. A. O'Brien, D. Steiner, M. J. Embrechts, L. Deutch, P. Gierszewski*
- 1617** A Model for the Mechanical Interaction Between Solid Breeder and Cladding Materials / *G. E. Orient, N. M. Ghoniem*
- 1623** The Bowing of Solid Breeder Rods in a Pin-Type Fusion Reactor / *J. P. Blanchard, N. M. Ghoniem*

(Continued)

CONTENTS / NOVEMBER 1986—VOL. 10, NO. 3 PARTS 2A and 2B

(Continued)

- 1628** Steady-State and Transient Thermal Hydraulics of a Breeder-in-Tube Blanket Design / *S. P. Grotz, N. M. Ghoniem*
- 1634** Neutronic Optimization of a LiAlO₂ Solid Breeder Blanket / *P. Levin, N. M. Ghoniem*
- 1640** Thermal-Hydraulic Study of the ESPRESSO Blanket for a Tandem Mirror Reactor / *A. R. Raffray, M. A. Hoffman*

DEPARTMENTS

- 1646** Technical Reviewers
- 1648** Volume 10 Indexes
- xxi** Volume 10 Contents