

Transactions of Fusion Science and Technology

CONTENTS / JANUARY 2005—VOL. 47, NO. 1T

**Proceedings of the
FIFTH INTERNATIONAL CONFERENCE
ON OPEN MAGNETIC SYSTEMS
FOR PLASMA CONFINEMENT
Novosibirsk, Russia
July 5–9, 2004**

- vii Comments / *Nermin Uckan*
- ix Preface: Fifth International Conference on Open Magnetic Systems for Plasma Confinement / *E. P. Kruglyakov*
- 1 Recent Progress in Mirror Studies in Novosibirsk / *E. P. Kruglyakov, G. I. Dimov, A. A. Ivanov, V. S. Koidan*
- 9 Recent Progress in the GAMMA 10 Tandem Mirror / *T. Cho et al.*
- 17 Progress in the Study of RF Heating and Stabilization on HANBIT Mirror Device / *M. Kwon et al.*
- 23 Experiments on the AMBAL-M Central Solenoid / *T. D. Akhmetov et al.*
- 27 Status of the GDT Experiment and Future Plans / *A. Abdrashitov et al.*
- 35 Progress on the Multimirror Trap GOL-3 / *V. S. Koidan et al.*
- 43 Experimental and Computational Study on the Cusp-DEC and TWDEC for Advanced Fueled Fusion / *Y. Tomita, Y. Yasaka, H. Takeno, M. Ishikawa, T. Nemoto*
- 49 Axisymmetric Tandem Mirrors: Stabilization and Confinement Studies / *R. F. Post et al.*
- 59 First Results from SHIP Experiment / *P. A. Bagryansky et al.*
- 63 ECH Plasma Experiments on an Internal Coil Device with a High Temperature Superconductor Coil / *Yuichi Ogawa et al.*
- 71 Estimates of the Transverse Thermal Losses for the Present and Future GOL-3 Experiments / *G. Vekstein*
- 74 Explanation of Turbulent Suppression of Electron Heat Transfer in GOL-3 Facility at the Stage of Relativistic Electron Beam Injection / *A. V. Burdakov, I. A. Kotelnikov, V. I. Erofeev*

(Continued)

CONTENTS / JANUARY 2005—VOL. 47, NO. 1T

(Continued)

- 78** Effect of the Radial Potential Profile on the Transport of the Bounced Ions by the Plug Potential and Radial Potential Control in the Tandem Mirror / *K. Ishii et al.*
- 84** Role of q Profile for Plasma Confinement in the Multimirror Trap GOL-3 / *V. V. Postupaev et al.*
- 92** Study of Fast Ion Profiles in the Gas Dynamic Trap / *A. V. Anikeev et al.*
- 96** High Power Electron Heating Experiments at the Plug Region of GAMMA 10 / *T. Saito et al.*
- 100** A Scaling Law of Plasma Confining Potential Formation with Electron Cyclotron Heating Powers in GAMMA 10 / *T. Numakura et al.*
- 104** Low Frequency Fluctuations in ICRF-Heated Plasmas on GAMMA 10 / *M. Ichimura et al.*
- 108** High Power Hydrogen Injector with Beam Focusing for Plasma Heating / *P. P. Deichuli et al.*
- 112** Low Pressure Discharge and Slow Wave Heating in Hanbit Mirror Device / *B. H. Park et al.*
- 116** Numerical Modeling of Radio Frequency Fields in Plasma / *V. E. Moiseenko*
- 120** Preionization in the Hanbit Tandem Mirror / *A. C. England et al.*
- 124** Multicusp Trap as Model of Plasma Neutralizer for ITER Neutral Beam Injector / *V. A. Belyaev et al.*
- 128** Flow Shear Effects on Plasma Microinstability in Open-Ended Magnetic Configurations / *T. Kaneko, R. Hatakeyama*
- 134** The ZaP Flow Z-Pinch: Plasma Flow Shear and Stability / *D. J. Den Hartog, R. P. Golingo, S. L. Jackson, B. A. Nelson, U. Shumlak*
- 138** Divertor Stabilization in Mirrors / *V. P. Pastukhov*
- 144** Ballooning Modes in the Systems Stabilized by Divertors / *V. V. Arsenin, A. A. Skovoroda, A. V. Zvonkov*
- 148** Axial Electron Heat Loss from Mirror Devices Revisited / *D. D. Ryutov*
- 155** Neutral Beam Injection Experiments and Related Behavior of Neutral Particles in the GAMMA 10 Tandem Mirror / *Y. Nakashima et al.*
- 159** Motional Stark Effect Diagnostic for Multi-Chord Measurements of Plasma Beta in GDT / *G. F. Abdrachitov et al.*
- 163** RF Power and Magnetic Field Modulation Experiments with Simple Mirror Geometry in the Central Cell of Hanbit Device / *S. G. Lee, J. G. Bak, H. G. Jhang, S. S. Kim*
- 167** Gas Puffing into the AMBAL-M Solenoid Plasma / *T. D. Akhmetov et al.*
- 171** Spectroscopic Measurements of Hot Plasma Temperature on the Multimirror Trap GOL-3 / *I. A. Ivanov et al.*

(Continued)

CONTENTS / JANUARY 2005—VOL. 47, NO. 1T

(Continued)

- 175 Neutral Transport and Particle Balance in Hanbit Magnetic Mirror Device / *S. W. Yoon et al.*
- 179 Application of Thomson Scattering System at 1.06 μm for Study of Plasma Density Dynamics at Multimirror Trap GOL-3 / *S. V. Polosatkin et al.*
- 183 Numerical Study of Microwave Imaging Reflectometer for a Tandem Mirror Device / *M. Ignatenko, A. Mase, L. Bruskin, Y. Kogi, H. Hojo*
- 187 Influence of Non-MHD Flutes on the Efficiency of Energy Transfer from the Laser-Produced, ICF and Space Exploding Plasmas to Magnetic Field / *Yuri P. Zakharov et al.*
- 191 Improvement of Flow Characteristics for an Advanced Plasma Thruster / *M. Inutake et al.*
- 197 Capabilities of Imaging Interferometry for Plasma Diagnostics in Open Systems / *L. N. Vyacheslavov, A. L. Sanin, K. Tanaka, K. Kawahata*
- 201 Small Accelerators for the Next Generation of BNCT Irradiation Systems / *T. Kobayashi, K. Tanaka, G. Bengua, M. Hoshi, Y. Nakagawa*
- 205 Potential of Mirror Systems as Future Fusion Power Reactors / *Guenter Kessler, Gerald L. Kulcinski*
- 212 Plasma Simulation for the SHIP Experiment at GDT / *A. V. Anikeev, P. A. Bagryansky, S. Collatz, K. Noack*
- 215 Comparison of the Radially Produced Electric-Field Shear Effects Analyzed from End-Loss Current and Central-Cell Soft X-Ray Data / *M. Hirata et al.*
- 218 Radiation Losses Studies with Pyroelectric Bolometer / *V. G. Kapralov et al.*
- 221 Development of Pellet Technologies for Plasma Fueling / *V. G. Kapralov et al.*
- 224 Modeling of a Starting Mode of Thermonuclear Reactor "Elemag" / *O. A. Lavrent'ev et al.*
- 228 Neutron Measurements in the SHIP Experiments / *V. V. Maximov*
- 231 Neutral Beam Injection System for the SHIP Experiment / *G. F. Abdrashitov et al.*
- 235 Ambipolar Confinement in 3D "Magnetic Wall" / *A. Skovoroda, A. Spitsyn*
- 238 ICR Heating in an Axisymmetric Solenoid / *T. D. Akhmetov et al.*
- 240 Continued Hot-Electron Plasma Production Studies in the Hanbit Plug / *J. S. Hong et al.*
- 243 Measurement of Excited Fast Alfvén Waves in the GAMMA 10 Tandem Mirror / *H. Higaki et al.*
- 246 Modelling of the Plasma Dynamics and Ion Heating in a Multimirror Trap / *V. T. Astrelin, A. V. Burdakov, N. G. Karlykhanov*
- 249 The Radio Frequency Heating of Magnum-psi / *R. Koch, A. M. Messiaen, N. J. Lopes Cardozo*

(Continued)

CONTENTS / JANUARY 2005—VOL. 47, NO. 1T

(Continued)

- 252 Ray Tracing Technique for Modeling of Power Deposition into Electron Cyclotron Resonance Discharge of a Simple Mirror Trap with Longitudinal Launch of Microwave Radiation / *E. D. Gospodchikov, O. B. Smolyakova, E. V. Suvorov*
- 255 The Beam Forming Numerical Simulation for High Power Neutral Injector / *A. Sorokin, P. Deichuli, A. Ivanov, V. Mishagin*
- 257 Experiment of Fundamental ECRH in the GAMMA 10 Central Cell / *Y. Tatematsu et al.*
- 260 Numerical Analysis for Controlling the Eigenmode Formation of Alfvén Waves in the GAMMA 10 Tandem Mirror / *Y. Yamaguchi et al.*
- 263 Confinement Asymmetry and Trapped Particle Effects on Radial Transport in Charged Plasmas / *A. A. Kabantsev, C. F. Driscoll*
- 267 Investigation of Impurity Dynamics at GOL-3 Facility / *S. V. Polosatkin, A. V. Burdakov, V. Piffel, V. V. Postupaev, V. Weinzettl*
- 270 Experimental Study of Isotope Scaling of Radial Ion Thermal Transport in Axisymmetric Magnetic Field / *V. G. Sokolov, A. K. Sen*
- 273 Reconstruction of Neutral Hydrogen Density Profiles in HANBIT Magnetic Mirror Device Using Bayesian Probability Theory / *J.-S. Yoon, D.-C. Seo, H.-K. Na, S.-W. Yoon*
- 276 The Radial Loss of Ions Trapped in the Thermal Barrier Potential and the Design of Divertor Magnetic Field in GAMMA10 / *I. Katanuma et al.*
- 279 Effect of Differential Rotation on Plasma Stability in the Gas-Dynamic Trap / *A. D. Beklemishev, M. S. Chaschin*
- 282 Theoretical Investigations on the Relation Between Neutral Pressure and Beta in HANBIT Mirror Discharges / *S. S. Kim, S. W. Yoon, S. G. Lee*
- 285 Minimum B Field with Optimal Ellipticity and Idea for Improved Axial Confinement by Tuned ICRH Cycles / *O. Ågren, N. Savenko*
- 288 Study on Axially Distributed Divertor Magnetic Field Configuration in a Mirror Cell / *M. K. Islam, Y. Nakashima, Y. Higashizono, I. Katanuma, T. Cho*
- 291 Radial Profile Measurements of Plasma Parameters in the Central Cell of the Hanbit Mirror Device / *J. G. Bak, S. G. Lee, The Hanbit Project Team*
- 294 Method for Studying Local Dynamics of Plasma Fluctuations in the Formation Process of Langmuir Cavities / *V. S. Burmasov, I. V. Kandaurov, E. P. Kruglyakov, S. S. Popov*
- 297 Analysis of Neutral Transport in the GAMMA10 Anchor-Cell Using $H\alpha$ -Emission Detectors / *Y. Higashizono et al.*
- 300 Fluctuation Measurement Using an Ultrashort-Pulse Reflectometry on the GAMMA 10 / *A. Itakura et al.*
- 303 X-Ray Energy Responses of Silicon Tomography Detectors Irradiated with Fusion Produced Neutrons / *J. Kohagura et al.*

(Continued)

CONTENTS / JANUARY 2005—VOL. 47, NO. 1T

(Continued)

- 306** Measurement of the Radial Flux Induced by the Fluctuations Using the Gold Neutral Beam Probe in the Tandem Mirror GAMMA 10 / *A. Kojima et al.*
- 309** Diagnostic Neutral Beam Injector for Active Plasma Spectroscopy at Gas-Dynamic Trap / *S. A. Korepanov, P. O. Deichuli, A. A. Ivanov, V. V. Mishagin*
- 312** On the Theory of Diamagnetic Measurements in Open Traps / *I. A. Kotelnikov*
- 315** Energy Analyser for Hot Ion Density Profile Measurements in GDT / *S. V. Murakhtin, V. V. Prikhodko*
- 318** Measurements of Wall Recycling Coefficient in the HANBIT Mirror Device / *D. C. Seo, H. K. Na, J. S. Yoon, S. W. Yoon*
- 321** Development of an RF-Ion Source for Plasma Diagnostic in the Magnetic Fusion Devices with Long Pulse Duration / *I. V. Shikhovtsev et al.*
- 324** Study of Charge-Exchange Neutrals Emission from Hot Plasma at the Multimirror Trap GOL-3 / *A. V. Burdakov, G. E. Derevyankin, V. S. Koidan, A. A. Shoshin, Yu. A. Trunev*
- 327** Dispersion Interferometer Based on CO₂ Laser / *P. A. Bagryansky et al.*
- 330** Multi-Seconds Diagnostic Neutral Beam Injector Based on Arc-Discharge with LaB₆ Hollow Cathode / *P. P. Deichuli et al.*
- 333** Detection of Fusion Neutrons on the Multimirror Trap GOL-3 / *A. V. Burdakov et al.*
- 336** RF Field Study near the Ion Cyclotron Frequency in the HANBIT Mirror Device / *J. H. Yeom, C. M. Ryu, T. Lho, M. Kwon, B. H. Park*
- 339** H α Measurements in the Plug/Barrier Cells of the Tandem Mirror GAMMA 10 / *M. Yoshikawa et al.*
- 342** Compact Toroid and Advanced Fuel—Together to the Moon?! / *S. V. Ryzhkov*
- 345** Multicharged Ion Generation in Plasma Created by Millimeter Waves and Confined in a Cusp Magnetic Trap / *S. Golubev et al.*
- 348** Electrode System for Plasma Source with Crossed Fields / *I. N. Churkin, E. P. Semenov, A. G. Steshov, V. I. Volosov*
- 351** Recuperation of Charged Particle Energy in Traps with Rotating Plasma / *V. I. Volosov*
- 354** Volume 47, No. 1T Indexes