

15th International Congress on Plasma Physics (ICPP 2010) and 13th Latin American Workshop on Plasma Physics (LAWPP 2010)

Journal of Physics: Conference Series Volume 511

**Santiago, Chile
8-13 August 2010**

**ISBN: 978-1-63439-291-4
ISSN: 1742-6588**

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by the Institute of Physics
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

FUNDAMENTAL PLASMAS

012001 2.5D Relativistic Electromagnetic Pic Code for Simulation of the Beam Interaction with Plasma in Axial-symmetric Geometry	1
<i>Y M Tolochkevych, T E Litoshenko, I O Anisimov</i>	
012002 On Correction Factor in Scaling Law for Low Pressure DC Gas Breakdown	7
<i>G Ronchi, M Machida</i>	
012003 Transversal Dynamics of Relativistic Charged Particle Beams	11
<i>R P Nunes, F B Rizzato</i>	
012004 Nonlinear Behavior of Double Ion Beam Distributions	17
<i>P A Muñoz, J A Araneda</i>	
012005 Collective Modes in Free Plasmas Subjected to a Radiation Field	23
<i>B V Ribeiro, D D A Santos, M A Amato, A L A Fonseca</i>	
012006 Mechanism of Nonlinear Oscillitons Evolved from Simple Solitary Waves.....	29
<i>J Z G Ma, A Hirose</i>	
012007 The Alfvén Resonance in Pair Plasmas	35
<i>N F Cramer</i>	
012008 Dense Dust Structures in Cryogenic Complex Plasma	39
<i>S N Antipov, M M Vasiliev, M M Alyapyshev, O F Petrov, V E Fortov</i>	
012009 Soliton, Double Layer and Shock Formation in Pair-Ion Plasmas	43
<i>S Mahmood, H U Rehman, W Masood, N Imtiaz</i>	
012010 Ion Acoustic Mode in Permeating Plasmas.....	50
<i>J Vranjes, S Poedts</i>	
012011 Kinetic Dust Acoustic Mode in Inhomogeneous Partially Magnetized Plasma	54
<i>J Vranjes, S Poedts</i>	
012012 Dissipation Mechanism in 3D Collisionless Magnetic Reconnection	59
<i>K Fujimoto</i>	

COLD PLASMAS

012013 On the Influence of Metastable States and the Behavior of the EEDF in the Characterization of the Negative Glow of a N₂-AR Discharge by OES	64
<i>L Isola, M López, B J Gómez, V Guerra</i>	
012014 Experimental Study of a Glow Discharge of CH₂-C₁₂.....	70
<i>A Gomez, L Salazar-Flores, H Martinez, P G Reyes, F Castillo</i>	
012015 Electron Inertia Effect on Floating Plasma Potential	74
<i>V N Duarte, R A Clemente</i>	
012016 Optical Characterization of Glow and Afterglow Regions of Ar/O₂ Microwave Plasma: Effect of Applied Power and Gas Flow	80
<i>J V Da Maia, R S Pessoa, A S Da Silva Sobrinho, M Massi, H S Maciel</i>	
012017 Spectroscopic Characterization Of RF Hydrocarbon Plasmas For DLC Coatings	85
<i>F Guzmán, M Ruiz, E Valderrama, M Favre, H Bhuyan, E S Wynham, H Chuaqui</i>	
012018 Analysis Of The Different Zones Of Glow Discharge Of Ethyl Alcohol (C₂H₆O)	90
<i>C Torres, P G Reyes, J Mulia, F Castillo, H Martinez</i>	
012019 Characterization a Low Pressure of Plasma of Methanol (CH₄O) Alcohol	94
<i>M Villa, C Torres, P G Reyes, D Osorio, F Castillo, H Martínez</i>	

DENSE PLASMAS, PINCHES, BEAMS AND PULSED POWER

012020 Investigation of a Klystron with a Pseudospark-sourced Electron Beam	98
<i>D Bowes, H Yin, A W Cross, W He, A D R Phelps, K Ronald, X Chen, D Li</i>	
012021 Neutron Emission Characterisation at the FN-II Dense Plasma Focus.....	102
<i>F Castillo-Mejía, I Gamboa-De Buen, J J E Herrera-Velázquez, J Rangel-Gutiérrez</i>	
012022 Soft X-Ray Emission Analysis Of A Pulsed Capillary Discharge Operated In Nitrogen.....	108
<i>M P Valdivia, J C Valenzuela, E S Wyndham, M Favre, H Chuaqui, H Bhuyan</i>	

012023 A Compact Ultrafast Capillary Plasma Discharge As an Intense XUV Source.....	112
<i>J C Valenzuela, M P Valdivia, E S Wyndham, M Favre, H Chuaqui, H Bhuyan</i>	
012024 Dense Plasma Focus PACO As a Hard X-ray Emitter: A Study on the Radiation Source.....	117
<i>L Supán, S Guichón, M Milanese, J Niedbalski, R Moroso, H Acuña, F Malamud</i>	
012025 Measurements of Ions Emission Using ToF Method and CR39 Ssntd in a Small Plasma Focus Device of Hundreds of Joules.....	123
<i>J Moreno, J Pedreros, L Soto</i>	
012026 Current Measurement by Faraday Effect on Gepopu	129
<i>N Correa, H Chuaqui, E Wyndham, F Veloso, J Valenzuela, M Favre, H Bhuyan</i>	
012027 Initial Stages in Hundreds of Joules Plasma Focus Operating in Deuterium – Argon Mixtures: Preliminary Results	135
<i>F Veloso, L Soto, C Pavez, J Moreno</i>	
012028 Potentaility of a Table Top Plasma Focus As X-Ray Source: Radiographic Applications	140
<i>C Pavez, M Zambra, F Veloso, J Moreno, L Soto</i>	
012029 Experimental Study on the Optimization for Neutron Emission in a Small Fast Plasma Focus Operated at Tens of Joules.....	146
<i>A Tarifeño-Saldivia, L Soto</i>	
012030 Modeling of the Pinch Electron-density Distribution in a Small Plasma Focus	152
<i>A Márquez, J González, A Tarifeño, C Pávez, A Clausse, L Soto</i>	
012031 Numerical Simulation of Current Sheet Instabilities in a Small Plasma Focus.....	156
<i>F Casanova, A Tarifeño, F Veloso, L Soto, A Clausse</i>	
012032 Non-radioactive Source for Field Applications Based in a Plasma Focus of 2J: Pinch Evidence	161
<i>L Soto, C Pavéz, J Moreno, J Pedreros, L Altamirano</i>	
012033 Pinch Density Measurements in Compact Plasma Foci of 400J and 5J	164
<i>A Tarifeño-Saldivia, C Pavez, L Soto</i>	
012034 Optical Emission Spectroscopy Observations of Fast Pulsed Capillary Discharge Plasmas	168
<i>G Avaria, M Ruiz, F Guzmán, M Favre, E S Wyndham, H Chuaqui, H Bhuyan</i>	
012035 Generation and Application of the Soft X-ray Laser Beam Based on Capillary Discharge	174
<i>O Frolov, K Kolacek, J Straus, J Schmidt, V Prukner, A Shukurov</i>	
012036 A Model of Hard X-rays Emission from Free Expanding Plasma-focus Discharges	179
<i>E Fogliatto, J González, M Barbaglia, A Clausse</i>	

FUSION PLASMAS

012037 SCR-1: Design and Construction of a Small Modular Stellarator for Magnetic Confinement of Plasma.....	183
<i>L Barillas, V I Vargas, A Alpizar, J Asenjo, J M Carranza, F Cerdas, R Gutiérrez, J I Monge, J Mora, J Morera, H Peraza, V Queral, C Rojas, D Rozen, F Saenz, G Sánchez, M Sandoval, H Trimiño, J Umaña, L F Villegas</i>	
012038 Alfvén and Helicon Wave Resonances Measured with Demodulator Circuit in TCABR.....	189
<i>P G P Puglia, A G El'simov, L F Ruchko</i>	
012039 Analysis of the Electron Temperature Measurement in TCABR Tokamak by Electron Cyclotron Emission and Infrared Thomson Scattering Diagnostics	195
<i>O C Usuriaga, F O Borges, A G El'simov, R P Da Silva, M H Ono, P G P Puglia, M P Alonso, J H F Severo, I C Nascimento, E K Sanada, W P De Sá, R M O Galvão, J I Elizondo</i>	
012040 Comparison of Plasma Visible Spectral Emissions Between Nova-UNICAMP and TCABR Tokamaks	201
<i>F Do Nascimento, M Machida, G Ronchi, L M F Schmutzler, J H F Severo, I C Nascimento, E K Sanada</i>	
012041 Investigation of Non-inductive Plasma Current Start-up by RF on QUEST	205
<i>M Ishiguro, K Hanada, H Liu, R Ogata, M Isobe, S Tashima, H Zushi, K Sato, A Fujisawa, K Nakamura, H Idei, M Sakamoto, M Hasegawa, Y Takase, T Maekawa, Y Kishimoto, O Mitarai, S Kawasaki, H Nakashima, A Higashijima</i>	
012042 Construction of a Plasma Confinement Device TOKASTAR-2 with Tokamak-Helical Hybridization Concepts.....	211
<i>T Oishi, K Yamazaki, H Arimoto, K Baba, M Hasegawa, T Shoji</i>	
012043 Thermal Stability Studies of an Experimental Nuclear Fusion Reactor	217
<i>J J Martinell, J E Vitela</i>	
012044 Modelling of the Ignitor Scrape-off Layer Including Neutrals	223
<i>F Subba, F Bombarda, G Maddaluno, G Ramogida, R Zanino</i>	
012045 Collisional-radiative Modeling of the Transient Excitation of a Carbon Atoms Beam Crossing a Tokamak Plasma Edge	229
<i>A Bultel, I F Schneider, D Benredjem, P Monier-Garbet</i>	

012046 Diffusive Transport Analysis in Low Aspect Ratio Reversed Field Pinch	235
<i>Y Nagamine, A Fukuyama, S Shiina, M Aizawa</i>	
012047 Progress Towards Numerical and Experimental Simulations of Fusion Relevant Beam Instabilities.....	240
<i>M King, R Bryson, K Ronald, R A Cairns, S L McConville, D C Speirs, A D R Phelps, R Bingham, K M Gillespie, A W Cross, I Vorgul, R Trines</i>	

ASTROPHYSICS AND SPACE PLASMAS

012048 Formal Proof of Flowers & Ruderman's Instability Mechanism in Magnetic Stars.....	245
<i>P Marchant, A Reisenegger</i>	
012049 Dynamics of the Electromagnetic Ion Cyclotron Nonlinear Solitary Structures in the Inner Magnetosphere.....	249
<i>T D Kaladze, N L Tsintsadze, J W Van Dam, W Horton, T W Garner, X R Fu</i>	
012050 Laboratory Astrophysics Experiments with Magnetically Driven Plasma Jets.....	256
<i>F Suzuki-Vidal, S V Lebedev, A Ciardi, S N Bland, G N Hall, G Swadling, A J Harvey-Thompson, G Burdiak, P De Grouchy, J P Chittenden, M Bocchi, S C Bott, A Frank</i>	
012051 3D PIC Code Investigations of Auroral Kilometric Radiation Mechanisms	262
<i>K M Gillespie, S L McConville, D C Speirs, K Ronald, A D R Phelps, R Bingham, A W Cross, C W Robertson, C G Whyte, W He, I Vorgul, R A Cairns, B J Kellett</i>	
012052 Numerical Simulation of Unconstrained Cyclotron Resonant Maser Emission	268
<i>D C Speirs, K M Gillespie, K Ronald, S L McConville, A D R Phelps, A W Cross, R Bingham, B J Kellett, R A Cairns, I Vorgul</i>	
012053 Detailed Kinetic of CO₂ Dissociation and C Ionization: Application to Atmospheric Martian Entries.....	273
<i>J Annaloro, A Bultel, P Omaly</i>	
012054 Features of Coronal Heating by Drift Waves	279
<i>J Vranjes, S Poedts</i>	
012055 Low-pressure Plasma Discharge of AR/N₂/CH₄ Ternary Mixture: Experimental Simulation of Titan's Atmosphere	284
<i>L Salazar-Flores, C Torres-Segundo, P G Reyes, F Castillo, H Martinez</i>	
012056 Coronal Mass Ejections and Disturbances in Solar Wind Plasma Parameters in Relation With Short Term Asymmetric Cosmic Ray Intensity Decreases.....	288
<i>P L Verma, S Soni, A K Pimpalkar</i>	
012057 Coronal Mass Ejections, Interplanetary Shocks In Relation With Forbush Decreases Associated With Intense Geomagnetic Storms	295
<i>P L Verma, N K Patel, M Prajapati</i>	
012058 Symmetric Cosmic Ray Intensity Decreases in Relation with Coronal Mass Ejections and Disturbances In Solar Wind Plasma Parameters	301
<i>P L Verma, O Tripathi, A K Vishwakarma</i>	
012059 CO and C2 Excited States Relaxation in CO₂ Plasmas Derived from a Collisional-radiative Model	308
<i>A Bultel, I F Schneider, Y Babou</i>	
012060 Coronal Mass Ejections And Disturbances In Solar Wind Plasma Parameters In Relation With Geomagnetic Storms	314
<i>P L Verma, P Singh, P Singh</i>	
012061 Scaled Experiment to Investigate Auroral Kilometric Radiation Mechanisms in the Presence of Background Electrons.....	321
<i>S L McConville, K Ronald, D C Speirs, K M Gillespie, A D R Phelps, A W Cross, R Bingham, C W Robertson, C G Whyte, W He, M King, R Bryson, I Vorgul, R A Cairns, B J Kellett</i>	

LASER PLASMA INTERACTION

012062 Temporal Description of Aluminum Laser-induced Plasmas by Means of a Collisional-radiative Model	327
<i>V Morel, A Bultel, B G Chéron</i>	
012063 Spectroscopic Study of Emission Coal Mineral Plasma Produced by Laser Ablation	333
<i>L P Vera, J A Pérez, H Riascos</i>	
012064 Characterization of a Laser Plasma Produced from a Graphite Target	338
<i>M Ruiz, F Guzmán, M Favre, S Hevia, N Correa, H Bhuyan, E S Wynham, H Chuaqui</i>	

PLASMA APPLICATIONS, MATERIALS AND PLASMA DIAGNOSTICS

012065 Diagnostics of Cutting ARC Plasmas	342
<i>L Prevosto, H Kelly</i>	
012066 C₂ Swan Spectrum Used As a Molecular Pyrometer in Transferred ARC and the Influence Noise to Signal Ratio on the Temperature Values	348
<i>H Nassar</i>	
012067 Experimental Investigation of Energy Balance in Plasma Arc Cutting Process.....	354
<i>T Kavka, S Tossen, A Maslani, M Konrad, H Pauser, T Stehrer</i>	
012068 Carbon Arc Plasma: Characterization and Synthesis of Nanosized SIC	360
<i>O Labeledz, A Huczko, J Gawraczynski, H Lange, C Czosnek, J F Janik</i>	
012069 Optimization of a PIH&D System Using a Cathodic Arc with Titanium.....	366
<i>M Fazio, A Kleiman, D G Lamas, D Grondona, A Marquez</i>	
012070 Characterization of Titanium Films Deposited with a Cathodic Arc Using a Straight Magnetic Duct.....	371
<i>F Bermeo, H D Torre, A Kleiman, F Minotti, A Marquez</i>	
012071 Numerical Modeling of a Cutting Torch.....	377
<i>B R Mancinelli, F O Minotti, H Kelly</i>	
012072 AFM, XRD and Optical Studies of Silver Nanostructures Fabricated under Extreme Plasma Conditions	383
<i>Y Malhotra, M P Srivastava</i>	
012073 Investigation of the Ion Beam Emission from a Pulsed Power Plasma Device	389
<i>A Henríquez, H Bhuyan, M Favre, M J Retamal, U Volkmann, E Wyndham, H Chuaqui</i>	
012074 A Permanent Magnet Hall Thruster for Pulsed Orbit Control of Lunar Polar Satellites	395
<i>B S Moraes, J L Ferreira, I S Ferreira, O C Winter, D C Mourão</i>	
012075 Treatment of Polycarbonate by Dielectric Barrier Discharge (DBD) at Atmospheric Pressure	401
<i>K G Kostov, Y A A Hamia, R P Mota, A L R Dos Santos, P A P Nascente</i>	
012076 Effects of the Magnetic Field Over the Nanometric Growth Morphology on the Material Synthesis in a Liquid Spray Thermal Plasma Reactor	407
<i>L Beiras, G Torrente, J Puerta, F Blanco</i>	
012077 Titanium Oxidation by RF Inductively Coupled Plasma	411
<i>R Valencia-Alvarado, A De La Piedad-Beneitez, R López-Callejas, S R Barocio, A Mercado-Cabrera, R Peña-Eguiluz, A E Muñoz-Castro, B G Rodríguez-Méndez, J M De La Rosa-Vázquez</i>	
012078 Optical Emission Spectroscopy of Aluminum Nitride Thin Films Deposited by Pulsed Laser Deposition.....	416
<i>J A Pérez, L P Vera, H Riascos, J C Caicedo</i>	
012079 Correlation between the OES Plasma Composition and ZnMnO Films Properties during Pulsed Laser	422
<i>H Riascos, D Ramírez, L M Franco</i>	
012080 Behavior of AISI SAE 1020 Steel Implanted by Titanium and Exposed to Bacteria Sulphate Deoxidizer.....	428
<i>E Dannier V Niño, H Garnica, V Dugar-Zhabon, G Castillo</i>	
012081 Syngas Generation from Organic Waste with Plasma Steam Reforming	433
<i>G Diaz, E Leal-Quiros, R A Smith, J Elliott, D Unruh</i>	
012083 Extended Numerical and Analytical Model for Heat Transfer with and without Phase Change in non Ferric Powder for Thermal Spray Plasma Conditions	439
<i>M D Abreu, J Puerta, F Blanco, A Guerrero, J Lira</i>	
012084 Study of Magnetic Field Enhanced Plasma Immersion Ion Implantation in Silicon	445
<i>E J D M Pillaca, K G Kostov, M Ueda</i>	
012085 On the Possibility of Measuring the Optical Spectrum of Light Sources by Means of a Rotating Mirror	451
<i>L Bernal, L Bilbao</i>	
012086 Adaptive Embedded Digital System for Plasma Diagnostics	455
<i>A González, O Rodríguez, O Mangual, E Ponce, X Vélez</i>	
012087 Absolute Calibration of Proportional Counter Based Fast Pulsed Neutron Detectors with Resolution Below 10⁵ neutron/pulse	460
<i>A Tarifeño-Saldivia, R E Mayer, C Pavez, L Soto</i>	
012088 Time-resolved Tuned Diode Laser Absorption Spectroscopy of Pulsed Plasma	463
<i>P Adámek, H T Do, M Cada, Z Hubicka, R Hippler</i>	
012089 Antecedents and Perspectives on the Development of Nuclear Energy in Chile.....	469
<i>G Gutiérrez</i>	
Author Index	