

TECHNICAL SESSIONS

MONDAY, JUNE 20

Session PL1: Plenary 1

Monday, June 20 8:00-8:50, Conference Center 12A-D

Session 1A: Explosive and Compact Pulsed Power I

Monday, June 20 9:30-12:00, Conference Center 10A-B

Session Chair: Matthew Domonkos, Air Force Research Laboratory

- 9:30 1A-1 (INVITED) Reducing PFN Marx Generator Size Using Nested Solid Insulation**
R. J. Adler, J. A. Gilbrech, D. New
Applied Energetics, Tucson, AZ, United States
- 10:00 1A-2 Pulser for High Altitude Jet Engine Re-Ignition**
I. S. Roth, M. A. Kempkes, M. P. J. Gaudreau, P. VerPlanck
Diversified Technologies, Inc., Bedford, MA, United States
- 10:15 1A-3 1MJ Compact Pulsed Current Source**
B. E. Fridman¹, B. Baoming Li², V. A. Belyakov¹, R. S. Enikeev¹, N. A. Kovrizhnykh¹,
Y. L. Kryukov¹, K. M. Lobanov¹, A. G. Roshal¹, R. A. Serebrov¹
¹STC, D.V. Efremov Scientific Research Institute of Electrophysical Apparatus, St. Petersburg,
Russian Federation
²National Key Laboratory of Transient Physics, Nanjing University of Science & Technology,
Nanjing, P. R. China
- 10:30 1A-4 Development of High Power Long Longevity GaAs Photoconductive Semiconductor Switches for Compact Pulsed Power**
J. Yuan¹, W. Xie¹, H. Li¹, H. Liu¹, J. Liu¹, X. Wang², W. Jiang²
¹Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China
²Department of Electrical Engineering, Tsinghua University, Beijing, China
- 10:45 1A-5 Development of Solid-State Pulse Forming Lines**
J. Liu, H. Li, H. Liu, J. Yuan, W. Xie
Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China
- 11:00 1A-6 Study of Nanosecond Pulsed Power Generator Based on Epi-Si Drift-Step Recovery Diode**
L. M. Merensky¹, A. F. Kardo-Sysoev², D. Shmilovitz³, Y. Sharabani¹, I. Shafir¹, A. Sher¹,
A. S. Kesar¹
¹Soreq NRC, Yavne, Israel
²Ioffe PTI, St. Petersburg, Russia
³Tel Aviv University, Tel Aviv, Israel
- 11:15 1A-7 Fast Rise Time Pulsed Power Generator Using IGBTs and Coaxial MPC**
T. Sakugawa¹, S. Ueda¹, H. Akiyama¹, K. Suematsu², A. Kouda², M. Watanabe²
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Suematsu Electronics Co. Ltd., Yatsushiro, Kumamoto, Japan
- 11:30 1A-8 Miniature Pulsed Power Generator Using a Magnetic Pulse Compression Circuit**
Y. Ito, K. Kouno, T. Sakamoto, T. Sakugawa, H. Akiyama
Graduate School of Science and Technology, Kumamoto University, Kumamoto City, Japan
- 11:45 1A-9 Design and Optimization Techniques for the Generation of Intense, Ultrafast Pulses with Nonlinear Transmission Lines**
J. M. Sanders, A. Kuthi, M. A. Gundersen

Session Chair: Steven Glover, Sandia National Laboratories

- 9:30** **1C-1 Advanced Imaging of Pulsed Atmospheric Surface Flashover**
A. S. Fierro, G. R. Laity, L. L. Hatfield, J. C. Dickens, A. A. Neuber
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 9:45** **1C-2 A Finite-Difference Time-Domain Simulation of Formative Delay Times of Plasma at High RF Electric Fields in Gases**
P. J. Ford, H. Krompholz, A. Neuber
Center for Pulsed Power and Power Electronics, Departments of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States
- 10:00** **1C-3 Study of Pulsed (nanosecond) Electric Breakdown of Pressurized Gas**
V. Vekselman, S. Yatom, J. Gleizer, Y. Krasik
Physics, Technion, Haifa, Israel
- 10:15** **1C-4 Nanosecond-Scale Spectroscopy of Vacuum Ultraviolet Emission from Pulsed Atmospheric Discharges**
G. R. Laity, A. A. Neuber, A. S. Fierro, J. C. Dickens, L. L. Hatfield
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 10:30** **1C-5 High Dielectric Constant Composites for High Power Antennas**
K. A. O'Connor, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 10:45** **1C-6 Weibull Statistical Analysis of Impulse-Driven Surface Breakdown Data**
M. P. Wilson¹, M. J. Given¹, I. V. Timoshkin¹, S. J. MacGregor¹, M. A. Sinclair², K. J. Thomas², J. M. Lehr³
¹Dept. Electronic & Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom
²Hydrodynamics Division, AWE Aldermaston, Reading, United Kingdom
³Exploratory Pulsed Power, Sandia National Laboratories, Albuquerque, NM, United States
- 11:00** **1C-7 Dielectric Surface Effects on Transient Arc Formation in Lightning Arrestor Connector (LAC) Devices**
H. P. Hjalmanson¹, A. C. Pineda², M. F. Pasik¹, R. E. Jorgenson¹
¹Sandia National Laboratories, Albuquerque, NM, United States
²Space Electronics Branch, Air Force Research Laboratory, Albuquerque, NM, United States
- 11:15** **1C-8 Effect of Electrode Surface Roughness on the Breakdown Jitter of a Nanoparticle-Infused Dielectric Oil Spark Gap Switch**
C. A. Yeckel, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 11:30** **1C-9 Pulsed Pre-breakdown Phenomena in High Pressurized Carbon Dioxide Including Supercritical State**
T. Ihara, T. Furusato, S. Kameda, T. Kiyon, S. Katsuki, M. Hara, H. Akiyama
Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
- 11:45** **1C-10 Highly Oriented BN Nanosheets in polymer/BN Nanosheet Composite Film with Increased Thermal Conductivity Using Nano Pulse-Width Electric Field**
H. -B. Cho, T. Nakayama, S. Tanaka, W. Jiang, H. Suematsu, T. Suzuki, N. C. Tung, K. Niihara
Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Niigata, 940-2188, Japan

Poster Session 1P: Components I: Insulation and Breakdown, Transmission Lines and Diagnostics

Monday, June 20 1:30-3:30, Regency Ballroom

Session Chair: Kenneth Struve, Sandia National Laboratories

1P-1 A Repetitive Operated High-Current Beam Collector

T. Xun, H. -W. Yang, J. -D. Zhang, J. Zhang, Z. -C. Zhang
College of Opto-electric Science and Engineering, National University of Defense Technology,
Changsha, Hunan, China

- 1P-2 Design of Compact Feed Through for 500 kV High Voltage Cable**
L. Veron¹, R. Rosol², J. -C. Brion³
¹CEA, Bruyères-le-Châtel, 91297 Arpajon Cedex, France
²CERN, TE/ABT/FPS, 01631 CERN Cedex, France
³Europulse, Route de Gignac, 46600 Cressensac, France
- 1P-3 Isolation Concepts for a HVPS-System with $5\mu\text{s}$ Pulse Generation**
M. Hohmann
Transtechnik GmbH & Co. KG, Munich/Holzkirchen, Germany
- 1P-4 Thermodynamic Modeling with Experimental Validation of the Pulsed and Periodic Operation of a High Power Resistor**
D. P. Muffoletto, T. M. DiSanto, K. M. Burke, J. L. Zirnheld
Electrical Engineering, University at Buffalo, Buffalo, NY, United States
- 1P-5 Comparison of Dielectric Strength of Transformer Oil at DC and Multimillisecond Pulses**
A. Pokryvailo, C. Carp, C. Scapellati
Spellman High Voltage Electronics Corporation, Hauppauge, United States
- 1P-6 Streamer Initiation and Propagation in Transformer Oil Under Positive and Negative Impulse Voltages**
J. Jadidian¹, J. G. Hwang¹, M. Zahn¹, L. A. A. Pettersson²
¹Dept. of Electrical Eng. and Computer Sci. , Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, United States
²ABB Corporate Research, Västerås, Sweden
- 1P-7 The Influence of Magnetite Nano Particles on the Behaviour of Insulating Oils for Pulse Power Applications**
M. J. Given¹, M. P. Wilson¹, I. V. Timoshkin¹, T. Wang¹, S. J. MacGregor¹, J. M. Lehr²
¹University of Strathclyde, Glasgow, United Kingdom
²Sandia National Laboratories, Albuquerque, United States
- 1P-8 Field Enhancement Simulation of a Nanoparticle-Infused Dielectric Oil with Roughened Electrodes**
C. A. Yeckel, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 1P-9 Glass Ceramic Breakdown Characteristics under Repetitively Pulsed Condition**
S. Wang, J. Zhang, H. Yang, T. Shu
College of Optoelectronic Science and Engineering, National University of Defense Technology,
Changsha, China
- 1P-10 High Voltage Breakdown of Alumina Insulators**
T. P. Hughes, L. I. Espada
Sandia National Laboratories, Albuquerque, United States
- 1P-11 Theoretical and Experimental Investigation of Electro Discharge Destruction of Non-Conducting Materials**
N. S. Kuznetsova, V. V. Lopatin, V. V. Burkin, D. V. Zhgun, N. A. Ivanov
Institute of High-Technology Physics, National Research Tomsk Polytechnic University, Tomsk,
Russian Federation
- 1P-12 The Study of Gas Abnormal Breakdown Characteristic under High Repetition Rate Pulsed Power**
C. Yu
Beijing Institute of Special Electromechanical Technology, Beijing, China
- 1P-13 Three-Dimensional Electromagnetic Modeling of Composite Dielectric Materials**

K. A. O'Connor, C. A. Eastman, N. J. Grove, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

- 1P-14 Numerical Generation of the Random Variable Impulse Breakdown Voltage of Gases**
E. Dolicanin¹, K. Stankovic¹, R. Maric², B. Iricanin¹, G. Ilic², R. Radosavljevic¹
¹Faculty of Electrical Engineering, University of Belgrade, Belgrade, Serbia
²Electric Power Industry of Serbia, Belgrade, Serbia
- 1P-15 Visualization of Positive Pulsed Streamer in Supercritical Carbon Dioxide by Schlieren Method**
T. Furusato, T. Ihara, S. Kameda, T. Kiyari, S. Katsuki, M. Hara, H. Akiyama
Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
- 1P-16 Study on Contact Resistance of Electric Circuit Model for Electromagnetic Railgun**
P. Liu^{1,2}
¹Department of Electrical Engineering, Tsinghua University, Beijing, China
²Beijing Institute of Special Electromechanical Technology, Beijing, China
- 1P-17 Development of Small Dimension High-Voltage Electronic Vacuum Devices**
V. D. Bochkov¹, D. V. Bochkov¹, V. N. Nikolaev¹, V. I. Teryoshin¹, P. V. Panov¹, A. V. Batrakov²,
K. V. Karlik², G. E. Ozur², D. I. Proskurovsky²
¹Pulsed Technologies Ltd., Ryazan, Russian Federation
²Institute of High Current Electronics RAS, Tomsk, Russian Federation
- 1P-18 Research on Breaking Capacity of Hybrid Circuit Breaker Base on Vacuum Interrupter and SF6 Interrupter in Series**
X. Cheng
School of Electrical Engineering, Dalian University of Technology, Dalian, China
- 1P-19 Simulation and Experimental Research on Dynamic Dielectric Recovery Characteristics for Vacuum Switch with Double-Breaks**
X. Cheng, M. Liao, X. Duan, J. Zou
School of Electrical Engineering, Dalian University of Technology, Dalian, China
- 1P-20 Research on Breaking Capacity of Hybrid Circuit Breaker Base on Vacuum Interrupter and SF6 Interrupter in Series**
X. Cheng, M. Liao, X. Duan, J. Zou
School of Electrical Engineering, Dalian University of Technology, Dalian, China
- 1P-21 The Impact of the Shunt Compensation on Effective and Reliable Power Transmission**
Y. Dvorkin¹, D. Rimorov², S. Tuzhilov², A. Mamishev¹
¹University of Washington, Seattle, United States
²Moscow Power Engineering Institute, Moscow, Russia
- 1P-22 Simulation Analysis of Transmission-Line Impedance Transformers with Gaussian, Exponential, and Linear Impedance Profile for Pulsed Power Accelerators**
Y. Hu¹, A. Qiu², T. Huang³
¹Northwest Institute of Nuclear Technology, Xi'an, China
²Northwest Institute of Nuclear Technology, Xi'an, China
³Northwest Institute of Nuclear Technology, Xi'an, China
- 1P-23 Parallel Plate Transmission Line Transformer**
S. J. Voeten¹, S. Brussaard¹, G. Pemen²
¹Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands
²Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands
- 1P-24 Analysis of Transmission Performance of the Radial Impedance Transformers**
R. Zhang, X. Zou, X. Wang
Department of Electrical Engineering, Tsinghua University, Beijing, China
- 1P-25 Development of the 1/4:7 165kV Fractional Turn Ratio Pulse Transformer**
H. Hu, K. Gan, Z. Tan, T. Li, H. Zhang

Institutes of the Applied Electronics, China Academy of Engineering Physics, Mianyang, China

- 1P-26 High-Voltage Picosecond Reflectometry in Investigations of Dynamic Characteristics of Discharge Gaps**
M. I. Yalandin, K. A. Sharypov, V. G. Shpak, S. A. Shunailov, A. G. Reutova, M. R. Ul'masculov
Laboratory of Electron Accelerators, Institute of Electrophysics, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russian Federation
- 1P-27 Coaxial Capacitive Voltage Divider for High Voltage Pulses with a Very Fast Rise Times**
T. Hobejogi, J. Biela
Dept. of Electrical Engineering, Laboratory for High Power Electronic Systems, Zurich, Switzerland
- 1P-28 Axial Propagation of Nano-Seconds Pulsed Discharge in Coaxial Reactor**
T. Hirota¹, S. Okada¹, D. Wang², T. Namihira³, H. Akiyama¹
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Priority Organization for Innovation and Excellence, Kumamoto University, Kumamoto, Japan
³Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 1P-29 A System for Pulsed Measurements Based on LabVIEW**
S. Korenev, C. Dew
Caterpillar Inc., Mossville, IL, United States
- 1P-30 Multivariate Analysis of Pulsed Power Diagnostics on the 2.4MV, 1MA Zebra Z-Pinch Generator**
V. Nalajala¹, B. Le Galloudec^{1,2}, R. Presura¹, V. Ivanov¹, V. Kantsyrev¹, N. Le Galloudec¹,
A. Astanovitskiy¹, S. Batie¹, A. Covington¹
¹Nevada Terawatt Facility/Dept of Physics, University of Nevada, Reno, Reno, NV, United States
²National Ignition Facility, Lawrence Livermore National Laboratory, Livermore, CA, United States
- 1P-31 Electro-Optic Kerr Effect Measurements of Intense Pulsed Electric Fields in Water**
F. Banakhr¹, B. M. Novac¹, I. R. Smith¹, L. Pecastaing², R. Ruscassie², A. de Ferron², P. Pignolet²
¹Electronic and Electrical Engineering, Loughborough University, Loughborough, United Kingdom
²Laboratoire de Genie Electrique, Pay University, Pau Cedex 9, France
- 1P-32 Preliminary Experiment on Electro-Optical Measurement of Electric Field on Insulator Surface**
W. Liu, H. Zhu, X. Zou, X. Wang
Dept. of Electrical Engineering, Tsinghua University, Beijing, China
- 1P-33 X-Ray Diode Preparation**
D. J. Henderson¹, C. V. Mitton¹, D. E. Good¹, K. W. Hogge¹, I. Molina¹, R. A. Howe¹, P. A. Flores¹,
K. D. McGillivray¹, W. M. Skarda¹, S. S. Lutz¹, D. S. Nelson², E. C. Ormond², S. R. Cordova²,
J. R. Smith³, T. J. Haines³, W. M. Wood³
¹NSTec, Las Vegas, NV, United States
²Sandia, Albuquerque, NM, United States
³Los Alamos National Laboratory, Los Alamos, NM, United States
- 1P-34 Cygnus X-Ray Pinhole Camera Measurements**
D. S. Nelson¹, E. C. Ormond¹, S. R. Cordova¹, J. R. Smith², M. J. Berninger³, D. E. Good³,
M. D. Hansen³, D. J. Henderson³, K. W. Hogge³, S. S. Lutz³, C. V. Mitton³, I. Molina⁴
¹Sandia National Laboratories, Albuquerque, NM, United States
²Los Alamos National Laboratory, Los Alamos, NM, United States
³National Security Technologies LLC, Las Vegas, NV, United States
⁴Great Basin Technology, Inc., Albuquerque, NM, United States
- 1P-35 Virtual Plasma Diagnostic Tool**
A. Eroglu
Engineering Department, Indiana University - Purdue University Fort Wayne, Fort Wayne, IN, United States
- 1P-36 An Optical Streak Camera Plasma Diagnostic for Radiographic Source Development**
M. D. Crain¹, S. L. Payne¹, D. W. Droemer¹, M. D. Johnston²

¹Sandia Operations, National Security Technologies, LLC, Albuquerque, NM, United States
²Dept 1656, Sandia National Laboratories, Albuquerque, NM, United States

1P-37 Infrared Imaging Diagnostics for Parameters of Powerful Ion Beams Formed by a Diode in a Double-Pulse Mode

Y. Isakova

Tomsk Polytechnic University, Tomsk, Russian Federation

Poster Session 1P: Microwaves I: Sources and Antennae, Slow Wave Devices, Systems

Monday, June 20 1:30-3:30, Regency Ballroom

Session Chair: Susan Heidger, Air Force Research Laboratory

1P-38 Nonlinear Dielectric-Based NLTL Modeling Using ICEPIC

B. W. Hoff¹, A. D. Greenwood¹, S. L. Heidger¹, D. M. French¹, J. Watrous²

¹Air Force Research Laboratory, Albuquerque, NM, United States

²NumerEx, Albuquerque, NM, United States

1P-39 Dielectric Nonlinear Transmission Line

D. M. French, B. W. Hoff, S. Heidger, D. Shiffler

High Power Microwave Division, Directed Energy Directorate, Air Force Research Laboratory, Albuquerque, NM, United States

1P-40 Multipacting Simulations in a Coaxial Transmission Line with VORPAL

C. M. Roark, C. Nieter, P. H. Stoltz

Tech-X Corporation, Boulder, CO, United States

1P-41 Electric Field Distributions in High Power Microwaves Confined by Plasma Column

S. S. M. Chung

Electronics Engineering, Southern Taiwan University of Technology, Tainan, Taiwan

1P-42 Modular, High-Power, Wideband Transmitters for Electromagnetic Environmental Effects (E3) Testing

T. A. Holt, M. B. Lara, C. Nunnally, C. W. Hatfield, J. R. Mayes

APELC, Austin, TX, United States

1P-43 A Multiple Burst, Variable Frequency, High Power Driver for Antenna Characterization

K. A. O'Connor, R. D. Curry

Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

1P-44 Pulsed Ring Down Source Array Steering

A. W. Myers, S. Holt, J. Dickens

Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

1P-45 Modular Interchangeable High Power Helical Antennas

M. B. Lara, M. G. Mayes, W. C. Nunnally, T. A. Holt, J. R. Mayes

Applied Physical Electronics, L.C., Austin, TX, United States

1P-46 Compact Relativistic Magnetron with Gaussian Radiation Pattern

S. Prasad, M. I. Fuks, E. Schamiloglu

Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States

1P-47 Study of a Novel Compact P-Band Magnetically Insulated Transmission Line Oscillator

X. P. Zhang, C. W. Yuan, T. Wang, H. M. Ren, L. R. Xu, Z. Q. Hong

College of Optoelectronic Science and Engineering, National University of Defense Technology, Changsha, Hunan, China

1P-48 RF Input for Sectioned Relativistic Amplifiers

M. Liu¹, M. I. Fuks¹, E. Schamiloglu¹, C. -L. Liu²

¹Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States

²Key Laboratory of Physical Electronics and Devices of the Ministry of Education, Xi'an Jiaotong University, Xi'an, China

- 1P-49** **Simulated Parameters of Subgigawatt Relativistic BWOs with Permanent Magnetic Systems**
V. V. Rostov¹, A. V. Gunin¹, E. M. Tot'meninov¹, K. A. Sharypov², V. G. Shpak², M. I. Yalandin²,
A. E. Yermakov³, S. V. Zhakov³, G. Demol⁴, R. Vezinet⁵
¹SB RAS, High Current Electronics Institute, Tomsk, Russia
²UB RAS, Institute of Electrophysics, Ekaterinburg, Russia
³UB RAS, Institute of Metal Physics, Ekaterinburg, Russia
⁴ITHPP F-46500, Thegra, France
⁵CEA/DAM GRAMAT F-46500, Gramat, France
- 1P-50** **A Novel Compact P-Band Coaxial Relativistic Backward Wave Oscillator with Only Three Periods Slow Wave Structure**
B. -L. Qian, L. Gao, X. -J. Ge
College of Optoelectric Science and Engineering, National University of Defense Technology, Changsha, Hunan 410073, China
- 1P-51** **High-Power Surface Field W-Band Cherenkov Oscillator**
I. V. Konoplev, A. Phipps, A. W. Cross, C. W. Robertson, A. R. Young, C. G. Whyte,
A. D. R. Phelps
Department of Physics, University of Strathclyde, Glasgow, United Kingdom
- 1P-52** **A 1D Large Signal Time-Domain Code for TWTs**
D. T. Lopes¹, C. C. Motta²
¹Instituto de Pesquisas Energeticas e Nucleares, Sao Paulo, SP, Brazil
²University of Sao Paulo - USP, Sao Paulo, SP, Brazil
- 1P-53** **A Four-Stage Depressed Collector Biasing Voltages Study Using the XMGUN Code**
C. C. Xavier, C. C. Motta
University of Sao Paulo - USP, Sao Paulo, SP, Brazil
- 1P-54** **High Power Microwave Generation from KALI 5000 Pulse Power System**
A. Roy, R. K. Menon, S. Mitra, S. Kumar, V. Sharma, A. Sharma, K. V. Nagesh, D. P. Chakravorthy
Accelerator and Pulse Power Division, Bhabha Atomic Research Centre, Mumbai, India
- 1P-55** **Development of the Microwave Test Facility at the University of Missouri Center for Physical and Power Electronics**
S. R. Ashby, R. L. Druce, M. B. Young, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 1P-56** **Multisource Radiation and Microwave Facility**
P. T. Heffernan, N. G. Kinsey, W. E. Carter, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 1P-57** **Compact High Power Microwave Source**
K. H. Baxter
Center for Engineering and Technological Excellence, Northrop Grumman Corporation, Fairfax, VA, United States
- 1P-58** **Influences of Coil Current and Gas Pressure on Inductively Coupled Plasma Parameters**
N. Delkash Rudsary
Radiation Department of Shahid Beheshti University, Tehran, Iran
- 1P-59** **A Saturable Metamaterial-Based Passive Limiter for Protection from HPM and UWB Sources**
P. Kelly, J. Mankowski
Department of Electrical and Computer Engineering, Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 1P-60** **Comparison of TDR and FDR Measurements with Established Models in Sandy Soil Types**
C. Umenviora¹, R. L. Druce¹, R. D. Curry¹, J. J. Bowders²
¹Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

²Dept. of Civil & Environmental Engineering, University of Missouri, Columbia, MO, United States

1P-61 Gigahertz Sources for Cancer Detection

S. Tantong, J. Baker, Z. Lu, N. E. Islam

Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States

1P-62 Design of a Damped Sinusoidal Oscillator System

J. M. Lee, H. O. Kwon, S. M. Hwang, J. W. Ahn

Research & Development Department 2, Hanwha Corporation, Gumi, Kyungbuk, South Korea

Poster Session 1P: Applications I: Fusion, EM, Beam, and Lasers

Monday, June 20 1:30-3:30, Regency Ballroom

Session Chair: Roger White, L-3 Communications, Pulse Sciences

1P-63 Expressions of the Optimal Electromagnetic Force

Q. A. Lv

Mechanical Engineering College, Shijiazhuang, China

1P-64 Unsymmetrical Lateral Electromagnetic Action and Optimization of the Distance Between Plates in the Passive Electromagnetic Armor

S. H. Chen

Mechanical Engineering College, Shijiazhuang, China

1P-65 Pinch Electromagnetic Action on the Shaped Charge Jet in the Passive Electromagnetic Armor

S. H. Chen

Mechanical Engineering College, Shijiazhuang, China

1P-66 Analysis of Conductor Impedances Accounting for Skin Effect and Nonlinear Permeability

M. P. Perkins, M. M. Ong, C. G. Brown Jr., R. D. Speer

Lawrence Livermore National Laboratory, Livermore, CA, United States

1P-67 Magnetic Forming and Cutting of Flat Thin Al Sheets

M. T. Pereira¹, H. Canacsinh^{2,3}, L. M. Redondo^{2,3}

¹João Bettencourt Teotónio Pereira, Lisbon, Portugal

²Lisbon Engineering Superior Institute, Lisbon, Portugal

³Nuclear Physics Center from Lisbon University, Lisbon, Portugal

1P-68 Statistical Properties of Modern Fast Photo Detectors

V. Ivanov, Z. Insepov

High-Energy Physics Division, Argonne National Laboratory, Argonne, IL, United States

1P-69 FRC Lifetime Studies for the Field Reversed Configuration Heating Experiment (FRCHX)

C. Grabowski¹, J. H. Degnan¹, D. J. Amdahl¹, R. K. Delaney¹, M. Domonkos¹, F. M. Lehr¹,

R. Magallanes¹, P. R. Robinson¹, E. L. Ruden¹, W. White¹, H. Wood¹, D. G. Gale², M. Kostora²,

J. McCullough², W. E. Sommars², M. H. Frese³, S. D. Frese³, J. F. Camacho³, S. K. Coffey³,

T. P. Intrator⁴, G. A. Wurden⁴, J. Sears⁴, P. J. Turchi⁴, W. J. Waganaar⁴, T. Weber⁴, R. E. Siemon⁵,

S. Fueling⁵, B. S. Bauer⁵, A. G. Lynn⁶, N. F. Roderick⁶

¹Air Force Research Laboratory, Kirtland AFB, NM, United States

²Science Applications International Corporation, Albuquerque, NM, United States

³NumerEx, Albuquerque, NM, United States

⁴Los Alamos National Laboratory, Los Alamos, NM, United States

⁵University of Nevada - Reno, Reno, NV, United States

⁶University of New Mexico, Albuquerque, NM, United States

Poster Session 1P: Explosive and Compact Pulsed Power

Monday, June 20 1:30-3:30, Regency Ballroom

Session Chairs: David Reisman, Lawrence Livermore National Laboratory
Robert Druce, University of Missouri - Columbia

- 1P-70 Electric Breakdown of Longitudinally-Shock-Compressed Pb(Zr_{0.52}Ti_{0.48})O₃ Ceramics**
S. I. Shkuratov¹, E. F. Talantsev², J. Baird¹
¹Loki Incorporated, Rolla, MO, United States
²Pulsed Power LLC, Lubbock, TX, United States
- 1P-71 Manufacturing of Targets and Assemblies for High Explosive and High Energy Pulsed Power Research at Los Alamos National Laboratory**
F. Fierro
MST, Los Alamos National Laboratory, Los Alamos, NM, United States
- 1P-72 Research on Magnetic Field Generated by MFCG Driven Solenoid**
H. Li
Mechanical Engineering College, Shijiazhuang, China
- 1P-73 An Ancillary Boundary Integral Equation for Magnetostatic Analysis**
M. S. Ingber, G. F. Kiuttu, J. A. Ingber, B. T. Smith
Accurate Solutions in Applied Physics LLC, Albuquerque, NM, United States
- 1P-74 The Effects of Inductance on the Metallization Removal of Exploding Films**
T. M. DiSanto, M. T. Muffoletto, D. P. Muffoletto, K. M. Burke, J. L. Zirnheld
University at Buffalo, Buffalo, NY, United States
- 1P-75 Compact Pulsed Power Using Solid Dielectric Transmission Lines**
M. T. Domanos¹, S. Heidger¹, D. Brown², A. Devoe³, F. Dogan⁴, D. Gale², J. O'Loughlin¹,
J. Parker², D. Sandoval², K. Slenes⁵, W. Sommars², J. Watrous⁶
¹AFRL/RDHP, Air Force Research Laboratory, Kirtland AFB, NM, United States
²SAIC, Inc., Albuquerque, NM, United States
³Presidio Components, San Diego, CA, United States
⁴Missouri Institute of Science and Technology, Rolla, MO, United States
⁵TPL, Inc., Albuquerque, NM, United States
⁶NumerEx, LLC, Albuquerque, NM, United States
- 1P-76 Pulsed Power Generator Using Solid-State LTDs**
W. Jiang¹, A. Tokuchi^{1,2}
¹Department of Electrical Engineering, Nagaoka University of Technology, Nagaoka, Niigata, Japan
²Pulsed Power Japan Laboratory, Ltd., Kusatsu, Shiga, Japan
- 1P-77 SLEP-150M Compact Supershort Avalanche Electron Beam Accelerator**
V. F. Tarasenko, I. D. Kostyrya, E. K. Baksht, D. V. R. V. Rybka
High Current Electronics Institute, Tomsk, Russian Federation
- 1P-78 Autonomous Compact and Repetitive Low-Energy Pulsed Power Generator**
M. J. Parker¹, B. M. Novac¹, I. R. Smith¹, P. Senior¹, G. Louverdis²
¹Electronic and Electrical Engineering Department, Loughborough University, Loughborough,
United Kingdom
²Security Services, Dstl Fort Halstead, Sevenoaks, United Kingdom
- 1P-79 Study of HV Dielectric Ceramics for Compact Pulsed Power**
J. O. Rossi, L. P. Silva Neto, A. R. Silva Junior
Associated Plasma Laboratory, National Institute for Space Research, S.J. Campos, SP, Brazil
- 1P-80 Dissipating Screen of Generators Based on Transformer Storage and Combination Vacuum Interrupter and Plasma Opening Switch**
O. G. Egorov
Atomic Corporation, TRINITI, Moscow reg., Troitsk, Russian Federation
- 1P-81 Self-Contained Source Based on an Innovating Resonant Transformer and an Oil Peaking Switch**
R. Pecquois¹, L. Pecastaing¹, M. Rivaletto¹, A. Silvestre de Ferron¹, P. Pignolet¹, L. Caramelle², J. -
M. Duband², R. Vezinet³
¹SIAME - UPPA, Pau, France

²Hi Pulse, Pont de Pany, France

³CEA GRAMAT, Gramat, France

- 1P-82 Rapid Capacitor Charger for Compact Pulsed Power Applications**
S. L. Holt, J. C. Dickens
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 1P-83 Reducing PFN Marx Generator Size Using Nested Solid Insulation**
R. J. Adler, J. A. Gilbrech, D. New
Applied Energetics, Tucson, AZ, United States
- 1P-84 Electrical Analysis of Piezoelectric Transformers and Associated High-Voltage Output Circuits**
J. A. VanGordon, B. B. Gall, S. D. Kovaleski, E. A. Baxter, B. H. Kim, J. W. Kwon
Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States
- 1P-85 Solid State Impulse Marx Generator**
J. R. Mayes, W. C. Nunnally, W. J. Carey
Applied Physical Electronics, LC, Austin, TX, United States
- 1P-86 Low Cost 400-Ps Rise Time Circuit-Board Marx Generator**
C. Nunnally, M. B. Lara, T. R. Smith, J. R. Mayes
Applied Physical Electronics LC, Austin, TX, United States
- 1P-87 Development of a High Repetition Rate and High Voltage Switching Power Supply with a SiC-JFET for an Induction Synchrotron**
K. Ise¹, K. Takaki¹, K. Okamura², M. Wake², K. Takayama², Y. Oosawa³, W. Jiang⁴
¹Iwate University, Morioka, Iwate, Japan
²High Energy Accelerator Research Organization, Tsukuba, Ibaragi, Japan
³SUN-A Corporation, Miyoshi, Hiroshima, Japan
⁴Nagaoka University of Technology, Nagaoka, Niigata, Japan
- 1P-88 Comparison of Computations and Experiments for Tests of Ranchero Flux Compression Generators Above 50 MA**
J. H. Goforth, R. G. Watt, W. L. Atchison, D. H. Herrera, R. K. Meyer, H. Oona, R. E. Reinovsky, C. L. Rousculp, L. J. Tabaka, D. T. Torres
Los Alamos National Laboratory, Los Alamos, NM, United States
- 1P-89 Mini-G: the Development of an Optimized FCG Device**
D. B. Reisman
Lawrence Livermore National Laboratory, Livermore, CA, United States
- 1P-90 Measuring FCG Voltage Using an Electric Field Antenna**
A. D. White, R. A. Anderson, J. B. Javedani, D. B. Reisman, D. A. Goerz
Lawrence Livermore National Laboratory, Livermore, CA, United States
- 1P-91 A Simple, Nearly 2D Explosively Shocked NdFeB(52) Permanent Magnet and a Comparison to a CALE Calculation Suggesting the Mechanism for Magnetic Flux Release and Subsequent EMF Pulse**
J. B. Chase¹, S. Ault², D. Reisman³
¹Care'n Co., Tracy, CA, United States
²Hyperspectral Sciences, Inc., Cinebar, WA, United States
³Lawrence Livermore Laboratories, Livermore, CA, United States
- 1P-92 Possible Mechanisms of Electric Field-Free Gas Breakdown**
S. I. Shkuratov¹, J. Baird¹, E. F. Talantsev², L. L. Altgilbers³
¹Loki Incorporated, Rolla, MO, United States
²Pulsed Power LLC, Lubbock, TX, United States
³U.S. Army Space and Missile Defense Command, Huntsville, AL, United States

M. A. Elsayed, A. A. Neuber, A. J. Young, J. W. Walter, C. S. Anderson, S. L. Holt, J. R. Korn,
M. Kristiansen
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

4:15 2A-3 Numerical Simulation of Electromagnetic Flux Compression for Super-Intense Magnetic Field Generation

W. Jiang¹, H. Sugiyama¹, A. Miyata², H. Sawabe², Y. Matsuda², S. Takeyama²
¹Department of Electrical Engineering, Nagaoka University of Technology, Nagaoka, Japan
²International MegaGauss Science Laboratory, Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan

4:30 2A-4 Miniature 100-kV Explosively Driven Prime Power Sources Based on Pb(Zr_{0.95}Ti_{0.05})O₃ Ferroelectric Ceramics

S. I. Shkuratov¹, J. Baird¹, E. F. Alberta², W. S. Hackenberger², A. H. Stults³, L. L. Altgilbers⁴
¹Loki Incorporated, Rolla, MO, United States
²TRS Technologies, Inc, State College, PA, United States
³U.S. Army Aviation Research, Development and Engineering Center, Huntsville, AL, United States
⁴U.S. Army Space and Missile Defense Command, Huntsville, AL, United States

4:45 2A-5 Ferroelectric Generator Design for Multiple Initiation of Blasting Caps

A. H. Stults
Aviation and Missile Research Development and Engineering Laboratory, Redstone Arsenal, AL, United States

5:00 2A-6 Shock Wave Generators

B. L. Freeman¹, G. C. Newsom¹, J. W. Guthrie¹, L. L. Altgilbers², M. S. Rader²
¹Directed Energy Div, Ktech Corporation, Albuquerque, NM, United States
²SMDC, US Army, Huntsville, AL, United States

5:15 2A-7 Cylindrical Ferro Electric Generators Waveshaping Techniques and Performance

Z. S. Roberts¹, F. Rose¹, S. Rendall¹, L. Altgilbers², A. Stults³, J. Sweitzer³
¹Radiance Technologies, Huntsville, AL, United States
²USASMDC, Huntsville, AL, United States
³AMRDEC, Huntsville, AL, United States

Session 2B: Microwaves II: Microwave and RF Sources, Antennae, and Systems

Monday, June 20 3:30-5:30, Conference Center 10C-D

Session Chair: Stephen Bayne, Texas Tech University

3:30 2B-1 Operational Performance of the Horizontal Fast Rise EMP Pulser at the Patuxent River EMP Test Facility

D. W. Belt, A. D. Mazuc
5.4.4.6, Naval Air Systems Command Aircraft Division, Patuxent River, MD, United States

3:45 2B-2 High Power Microwave Threat Simulator Facility at White Sands Missile Range

R. Blundell
Department of Army, White Sands, NM, United States

4:00 2B-3 A Novel HPM Array System Based on Mode Locking Multi Frequency

O. S. Zucker¹, P. K. L. Yu²
¹Polarix Corporation, San Diego, CA, United States
²University of California, San Diego, La Jolla, CA, United States

4:15 2B-4 Performances of an Ultra Compact, High-Power, Monocycle Pulse Former for WB and UWB Applications

P. Delmote, J. -P. Dupéroux, F. Bieth, S. Pinguet
EMW, Institut Franco-Allemand De Recherches De Saint-Louis (ISL), Saint Louis, France

4:30 2B-5 Delay Time Distribution of High Power Microwave Surface Flashover

J. Foster, H. Krompholz, A. Neuber

Center for Pulsed Power and Power Electronics, Departments of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

4:45 2B-6 Investigation of the Transmission Properties of High Power Microwave Induced Surface Flashover Plasma

S. Beeson, J. Foster, J. Dickens, A. Neuber

Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

5:00 2B-7 A Mobile Pulsed Ring-Down Source Array Using Low Power Solid State Radiators

D. Reale, J. Mankowski, S. Holt, J. Walter, J. Dickens

Center for Pulsed Power and Power Electronics, Dept. of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

5:15 2B-8 Reducing Both the Physical Size and Operational Frequency of Helical Antennas by Means of Dielectric Loading

M. B. Young, K. A. O'Connor, D. A. Crosby, R. D. Curry

Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

Session 2C: Pulsed Power Systems I: Generators and Networks

Monday, June 20 3:30-5:45, Conference Center 11A-B

Session Chair: Brett M. Huhman, US Naval Research Laboratory

3:30 2C-1 Status of the 2 MA Driver for Creating 2 MG Magnetic Fields for Cluster Fusion Experiments

K. W. Struve¹, J. W. Argo², R. D. Bengtson³, D. I. Headley¹, J. W. Kellogg¹, S. M. Lewis³, H. J. Quevedo³, M. E. Savage¹, B. S. Stoltzfus¹, C. J. Waugh¹, M. Wisler³

¹Pulsed Power Sciences Center, Sandia National Laboratories, Albuquerque, NM, United States

²Ktech Corporation, Albuquerque, NM, United States

³Dept. of Physics, University of Texas, Austin, TX, United States

3:45 2C-2 A Linear-Transformer-Driver (ltd) with Multiple Self-Triggered Switches

A. J. M. Pemen¹, Z. Liu², E. J. M. van Heesch¹

¹Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands

²Zhejiang University, Hangzhou, China

4:00 2C-3 High Power HV Generators of Sequential Two Nanosecond Pulses

G. Remnev, Y. Usov

National Research Tomsk Polytechnic University, Tomsk, Russian Federation

4:15 2C-4 A High-Power, High-Energy Pulsed Power Generator for High-Impedance Loads

M. J. Parker¹, B. M. Novac¹, I. R. Smith¹, P. Senior¹, G. Louverdis²

¹Electronic and Electrical Engineering, Loughborough University, Loughborough, United Kingdom

²Security Sciences Department, Dstl, Sevenoaks, United Kingdom

4:30 2C-5 Bipolar Pulse Generation Based on Unipolar Solid-State Marx Modulator with Blumlein Line Stack

J. P. Mendes^{1,2}, H. Canacsinh^{1,2}, L. M. Redondo^{1,2}, J. O. Rossi³

¹Nuclear Physics Center from University of Lisbon, Lisbon, Portugal

²Lisbon Engineering Superior Institute, Lisbon, Portugal

³Instituto Nacional de Pesquisas Espaciais, São Paulo, Portugal

4:45 2C-6 Optimizing Repetitive Bipolar Solid-State Marx Generators

H. Canacsinh^{1,2}, L. M. Redondo^{1,2}, J. F. Silva^{3,4}

¹Instituto Superior de Engenharia de Lisboa, Lisbon, Portugal

²Nuclear Physics Center from Lisbon University, Lisbon, Portugal

³Instituto Superior Técnico, TU Lisbon, Lisbon, Portugal

⁴Center for Innovation in Electrical and Energy Engineering, Lisbon, Portugal

5:00 2C-7 Bipolar Solid State Arbitrary-Waveform Marx Generator for Capacitive Loads

L. M. S. Redondo^{1,2}, H. Canacsinh^{1,2}, M. R. Gomes¹

¹Nuclear Physics Center from Lisbon University, Lisbon, Portugal

²Lisbon Engineering Superior Institute, Lisbon, Portugal

- 5:15** **2C-8 A Pulsed Power Generator with 20 Synchronous High-Voltage Output Pulses**
G. Deng, Z. Liu, B. Wang, K. Yan
Department of Chemical and Biological Engineering, Zhejiang University, The Industrial Ecological and Environmental Research Institute, Hangzhou, China
- 5:30** **2C-9 Inductive Adder Based Method for Generating Electromagnetic Pulse with Controllable Timing**
X. P. Yan, Z. Wang, P. Li, X. H. Hao, C. D. Yu, J. T. Wang
State Key Laboratory for Mechatronical Engineering and Control, Beijing Institute of Technology, Beijing, China

TUESDAY, JUNE 21

Session PL2: Plenary 2

Tuesday, June 21 8:00-8:50, Conference Center 12A-D

- 8:00** **PL2-1 Status and Recent Progress in Pulsed Power Applications at Karlsruhe Institute of Technology**
G. Mueller¹, W. An¹, T. Berghofer¹, M. DelGiacco¹, C. Eing¹, R. Fetzer¹, B. Flickinger¹, W. Frey¹, H. Giese¹, M. Gottle¹, C. Gusbeth¹, A. Heinzl¹, P. Hoppe¹, A. Jianu¹, F. Lang¹, K. Leber¹, M. Sack¹, G. Schumacher¹, J. Singer¹, R. Straessner¹, L. Wegner¹, A. Weisenburger¹, F. Zimmermann¹, V. Engelko²
¹Institute for Pulsed Power and Microwave Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
²Efremov Institute of Electrophysical Apparatus, St. Petersburg, Russia

Session 3A: Accelerators and Beams I: LTDs and High Current Accelerators

Tuesday, June 21 9:30-12:00, Conference Center 10A-B

Session Chair: Neal Graneau, AWE

- 9:30** **3A-1 Linear Transformer Driver (LTD) Research for Radiographic Applications**
J. J. Leckbee¹, S. R. Cordova¹, B. V. Oliver¹, T. J. Webb¹, M. Toury², M. Caron², R. Rosol², B. Bui³, T. Romero³, D. Ziska³
¹Sandia National Laboratories, Albuquerque, NM, United States
²CEA-DAM, Polygone d'expérimentation de Moronvilliers, Pontfaverger-Moronvilliers, France
³Ktech Corporation, Albuquerque, NM, United States
- 9:45** **3A-2 Development of a 1 MV Ultra-Fast LTD Generator**
F. Bayol¹, F. Cubaynes¹, R. Delplanque¹, P. Genez¹, C. Legras², M. Parzych², M. Toury³, M. Caron³, M. Mouillet³, A. A. Kim⁴
¹ITHPP, Hameau de Dréle, 46500 Thégra, France
²SEIV, Av du Val d'Or, 33703 Mérignac, France
³CEA, DAM, DIF, 91297, Arpajon, France
⁴HCEI, Acad. Ave. 2/3, 634055 Tomsk, Russia
- 10:00** **3A-3 Tests of a 1 MV LTD Generator at CEA**
M. Toury¹, M. Caron¹, L. Magnin¹, M. Mouillet¹, F. Bayol², F. Cubaynes², R. Delplanque², J. Leckbee³, B. Oliver³
¹CEA, DAM, DIF, Arpajon, France
²ITHPP, Thegra, France
³Sandia National Laboratories, Albuquerque, NM, United States
- 10:15** **3A-4 Experimental Validation of the First 1-MA Water Insulated Mykonos LTD Voltage Adder**

M. G. Mazarakis¹, M. E. Savage¹, W. E. Fowler¹, R. G. McKee¹, D. H. McDaniel¹, K. W. Struve¹,
W. A. Stygar¹, A. A. Kim², V. A. Sinebryukhov², P. Wakeland³
¹01671, Sandia National Laboratory, Albuquerque, NM, United States
²Pulsed Power Department, High Current Electronic Institute, Tomsk, Russia
³Engineering Department, Ktech, Albuquerque, NM, United States

10:30 3A-5 Experiments with the 2-Meter-Diameter, 810-KA LTD-III Accelerator Cavity

J. R. Woodworth¹, B. S. Stoltzfus¹, W. E. Fowler¹, W. A. Stygar¹, M. E. Sceiford¹,
M. G. Mazarakis¹, D. Anderson², M. J. Harden², R. White³, J. R. Blickem⁴, A. A. Kim⁵
¹1671, Sandia National Laboratories, Albuquerque, NM, United States
²National Security Technologies, Albuquerque, NM, United States
³L3 Communications, Pulse Sciences Division, San Diego, CA, United States
⁴Ktech Corporation, Albuquerque, NM, United States
⁵High Current Electronics Institute, Tomsk, Russia

10:45 3A-6 Conceptual Designs for an Upgrade of the Sphinx Z-Pinch Driver

F. Lassalle¹, A. Loyer¹, A. Georges²
¹CEA GRAMAT, 46500 Gramat, France
²CEA DIF, Moronvilliers, France

11:00 3A-7 A New Triggering Technology for LTD Switches Based on Reversed-LTD Principle

K. Liu
Department of Information of Science and Technology, Fudan University, Shanghai, China

11:15 3A-8 Foil-Flyer Electro-Magnetic Accelerator - Experimental Campaign

K. Omar¹, N. Graneau¹, M. Sinclair¹, B. M. Novac², I. R. Smith²
¹Hydrodynamics Division, AWE, Reading, United Kingdom
²Pulsed Power Group, Loughborough University, Loughborough, United Kingdom

11:30 3A-9 Technology for Large Scale Trigger System Based on PCSS Triggered V/n Switch

L. Zhou, J. Deng, L. Chen, M. Wang
Institute of Fluid Physics, CAEP, Mianyang, China

11:45 3A-10 High Pulse Currents

I. V. Lavrinovich, N. A. Ratakhin, V. F. Feduschak, A. A. Erfort
HDE, HCEI SB RAS, Tomsk, Russian Federation

Session 3B: Microwaves III: High Power Microwave Devices

Tuesday, June 21 9:30-12:00, Conference Center 10C-D

Session Chair: Dale Coleman, Sandia National Laboratories

9:30 3B-1 Virtual Prototyping of a 1.0 MW Conventional Magnetron Design

T. P. Fleming¹, P. J. Mardahl¹, M. Lambrecht¹, J. Keisling², M. Tracy³
¹Directed Energy Directorate, Air Force Research Lab, Kirtland Air Force Base, NM, United States
²Scientific Applications International Corporation, McLean, VA, United States
³Communications and Power Industries, Beverly, MA, United States

9:45 3B-2 Hysteresis Dependence of Mode Separation on Time-Varying Applied Voltage in a Magnetron with Diffraction Output

M. I. Fuks, E. Schamiloglu
Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States

10:00 3B-3 Amplitude and Phasing Control of Superradiative Pulses by the Magnetic Bias of Saturated Ferrite

V. V. Rostov¹, A. A. Elchaninov¹, A. I. Klimov¹, I. V. Romanchenko¹, G. A. Mesyats²,
M. I. Yalandin³
¹SB RAS, High Current Electronics Institute, Tomsk, Russia
²RAS, Lebedev Physical Institute, Moscow, Russia
³UB RAS, Institute of Electrophysics, Ekaterinburg, Russia

- 10:15** **3C-4 Cygnus Dose Quality**
E. C. Ormond¹, S. R. Cordova¹, D. S. Nelson¹, I. Molina², J. R. Smith³, D. E. Good⁴, M. D. Hansen⁴,
D. J. Henderson⁴, K. Hogge⁴, S. S. Lutz⁴, C. V. Mitton⁴
¹Sandia National Laboratories, Albuquerque, NM, United States
²Great Basin Technology Inc., Albuquerque, NM, United States
³Los Alamos National Laboratory, Los Alamos, NM, United States
⁴National Security Technologies, LLC, North Las Vegas, NV, United States
- 10:30** **3C-5 (INVITED) Spectroscopic Measurements in the Post-Hole Convolute on Sandia's Z-Machine**
M. R. Gomez¹, R. M. Gilgenbach¹, M. E. Cuneo², R. D. McBride², G. A. Rochau², B. Jones²,
D. J. Ampleford², D. B. Sinars², J. E. Bailey², W. A. Stygar², M. E. Savage², M. Jones²,
A. D. Edens², M. R. Lopez², E. Stambulchik³, Y. Maron³, D. V. Rose⁴, D. R. Welch⁴
¹Nuclear Engineering and Radiological Sciences Department, University of Michigan, Ann Arbor, MI, United States
²Sandia National Laboratories, Albuquerque, NM, United States
³Weizmann Institute, Rehovot, Israel
⁴Voss Scientific, LLC, Albuquerque, NM, United States
- 11:00** **3C-6 Design of a Diagnostic System for Use in Optical and Vuv Spectroscopy of Explosive Emission**
J. M. Parson
Electrical Engineering, Texas Tech University, Lubbock, TX, United States
- 11:15** **3C-7 Thermal Imaging Diagnostics of the High-Current Pulsed Electron Beam**
G. Kholodnaya¹, Y. Isakova¹, V. Koghevnikov²
¹Tomsk Polytechnic University, Tomsk, Russian Federation
²Institute of High-Current Electronics, Tomsk, Russian Federation
- 11:30** **3C-8 Study and Diagnosis the Power Transformer Bushing Insulation System**
A. K. Mehta
Electrical Engineering, National Institute of Technology Hamirpur, Himachal Pradesh India, Himachal Pradesh, India
- 11:45** **3C-9 Circuits for Digitally Synthesizing Very Long HPM Pulses in Compact Geometry**
O. S. Zucker
Polarix Corporation, San Diego, CA, United States

Poster Session 2P: Components II: High Energy Density Storage, Opening and Closing Switches

Tuesday, June 21 1:30-3:30, Regency Ballroom

Session Chair: Michael Mazarakis, Sandia National Laboratories

- 2P-1 High Energy Density Film Capacitors**
S. Zhang, C. Zou, R. Orchard, D. Kushner, X. Zhou
Strategic Polymer Sciences, Inc., State College, PA, United States
- 2P-2 Study on Self-Healing and Lifetime Characteristics of Metallized Film Capacitor**
Y. Chen, H. Li, F. Lin
Huazhong University of Science and Technology, College of Electrical and Electronic Engineering, Wuhan, Hubei, China
- 2P-3 Investigations on Increasing the Operation Voltage of Hybrid Supercapacitors Used in Pulsed Power System**
J. Song¹, L. Zhang², J. Zou³
¹Information Engineering, Dalian Ocean University, Dalian, Liaoning, China
²Electrical Engineering, Dalian University of Technology, Dalian, Liaoning, China
³Information Science & Engineering., Dalian Politechnic University, Dalian, Liaoning, China
- 2P-4 Arc Suppression Snubbers on Energy Extraction Switchgear in the LHC Superconducting Main Circuits of the LHC Collider: Impact on the Vital Quench Protection Systems**

K. Dahlerup-Petersen, F. Formenti, B. I. Panev
TE Department, CERN, Geneva, GE, Switzerland

- 2P-5 Power Triggered Vacuum Switches with Triggering Devices and Their Fields of Application**
V. A. Sidorov, D. F. Alferov, G. D. Domashenko, V. P. Ivanov
All-Russian Electrotechnical Institute, Moscow, Russian Federation
- 2P-6 Protection Against Pulse Overvoltages Based on a Triggered Vacuum Switch**
D. Alferov¹, D. Evsin¹, V. Filippov², V. Ivanov¹, V. Miroshnichenko², A. Perunov², U. Priseko²,
V. Sidorov¹
¹All-Russian Electrotechnical Institute (VEI), Moscow, Russian Federation
²VNITC VEI, Istra, Russian Federation
- 2P-7 A Two-Stage Breaker with “turnover” of a Capacitor Bank Potential**
O. G. Egorov
Atomic Corporation, TRINITI, Moscow reg., Troitsk, Russian Federation
- 2P-8 Novel Switching Power Supply for the KEK Digital Accelerator**
K. Okamura¹, K. Ise², K. Takaki², Y. Osawa³, M. Wake¹, T. Iwashita¹, K. Takayama¹
¹Accelerator Division 1, High Energy Accelerator Research Organization, Tsukuba, Japan
²Department of Electrical and Electronic Engineering, Iwate University, Morioka, Japan
³Sun-A Corporation, Miyoshi, Japan
- 2P-9 Research and Development of Drivers for Pseudospark Switches**
V. D. Bochkov¹, D. V. Bochkov¹, Y. B. Makeev¹, P. A. Bak², A. N. Panov², C. J. Pihl³,
S. P. Andreason³
¹Pulsed Technologies Ltd., Ryazan, Russian Federation
²Budker Institute of Nuclear Physics, Novosibirsk, Russian Federation
³Pulse Power Solutions LLP, Mill Creek, WA, United States
- 2P-10 Optically Triggered Pseudospark Switches with Magnesium Photocathodes**
E. B. Sozer, C. Jiang, M. A. Gundersen
Electrical Engineering/Electrophysics, University of Southern California, Los Angeles, CA, United States
- 2P-11 A Dielectric Body-Discharge Nanosecond Switch Triggered by Array Microhollow Cathode Discharge**
Y. Teng, K. Liu, J. Qiu
Department of Information Science and Technology, Fudan University, Shanghai, China
- 2P-12 Experimental Studies of a Simultaneously Operating Multi-Pin/Plane Corona Stabilised Switch**
B. M. Novac¹, J. L. Walsh², I. R. Smith¹
¹Department of Electronic and Electrical Engineering, Loughborough University, Loughborough, United Kingdom
²Department of Electrical Engineering and Electronics, Liverpool University, Liverpool, United Kingdom
- 2P-13 Numerical Simulation of Electric Field in Multichannel Multigap Gas Switches**
A. V. Kharlov
Institute of High Current Electronics, Tomsk, Russian Federation
- 2P-14 Experiment Study of a Low Inductance Three Electrode Field Distortion Gas Spark Switch for Linear Transformer Driver**
H. Wei^{1,2}, P. Liu², F. Sun¹, X. Jiang¹, J. Yin¹, T. Liang¹, Z. Liu¹, Z. Wang¹, A. Qiu¹
¹Northwest Institute of Nuclear Technology, Xi'an, China, Xi'an, China
²School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China
- 2P-15 Characterization of Paschen Curve Anomalies at High PD Values**
W. J. Carey¹, A. J. Wiebe¹, R. D. Nord¹, L. L. Altgilbers²
¹ARC Technology, Whitewater, KS, United States
²US Army Space and Missile Defense Command, Huntsville, AL, United States

- 2P-16 Experiments for Reducing the Jitter of an Over-Voltage Triggered Spark Gap**
F. Attmann, M. Sack, G. Mueller
Institute for Pulsed-Power and Microwave Technology, Karlsruhe Institute of Technology,
Karlsruhe, Baden-Wuerttemberg, Germany
- 2P-17 Time Jitter Studies of a Corona-Stabilised Closing Switch**
A. Larsson¹, D. Yap², Y. W. Lim²
¹Temasek Laboratories, National University of Singapore, Singapore, Singapore
²Applied Physics Laboratory, DSO National Laboratories, Singapore, Singapore
- 2P-18 Time Jitter Studies of a Small V/n Switch**
A. Larsson¹, D. Yap², Y. W. Lim²
¹Temasek Laboratories, National University of Singapore, Singapore, Singapore
²Applied Physics Laboratory, DSO National Laboratories, Singapore, Singapore
- 2P-19 Test Bed for Time Jitter Studies of Laser-Triggered Gas Discharge Switches**
A. Larsson¹, D. Yap², Y. W. Lim²
¹Temasek Laboratories, National University of Singapore, Singapore, Singapore
²Applied Physics Laboratory, DSO National Laboratories, Singapore, Singapore
- 2P-20 Study on Erosion Mechanism of Graphite Electrode in Two-Electrode Spark Gap**
H. Zeng, F. -C. Lin, G. Liu, L. Cai, L. Li, F. Yu, G. Hu, N. Liu
College of Electric and Electronic Engineering, HuaZhong University of Science and Technology,
Wuhan, Hubei Province, China
- 2P-21 The Research on the Trigger Characteristics of a Three-Electrode Spark Gap**
L. Cai, F. -C. Lin, H. Zeng, G. Liu, L. Li, X. Qi, J. Nan
College of Electrical and Electronic Engineering, HuaZhong University of Science and Technology,
Wuhan, Hubei Province, China
- 2P-22 Modular Trigger Generator for Over-Voltage Triggering of Marx Generators**
M. Sack, G. Mueller
Institute for Pulsed-Power and Microwave Technology, Karlsruhe Institute of Technology,
Karlsruhe, Baden-Wuerttemberg, Germany
- 2P-23 Evaluation of Experimental Silicon SGTO Devices for Pulsed Power Applications**
S. Lacouture¹, K. J. Lawson¹, S. B. Bayne¹, M. Giesselmann¹, H. O'Brien², C. J. Scozzie²
¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
²U.S. Army Research Laboratory, Adelphi, MD, United States
- 2P-24 Narrow and Wide Pulse Evaluation of Silicon Carbide SGTO Modules**
A. A. Ogunniyi¹, H. K. O'Brien¹, C. Scozzie¹, W. Shaheen², J. Zhang³, A. Agarwal³, V. Temple⁴
¹US Army Research Laboratory, Adelphi, MD, United States
²Berkeley Research Associate, Beltsville, MD, United States
³Cree Inc, Durham, NC, United States
⁴Silicon Power Corporation, Clifton Park, NY, United States
- 2P-25 Analysis of Silicon Carbide MOSFET Devices During Pulsed Operation**
K. J. Lawson, S. B. Bayne
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 2P-26 Fast, High-Voltage, High-Current SiC Thyristors for Pulsed Power**
H. D. Sanders¹, S. C. Glidden²
¹Solid State Switch Division, Applied Pulsed Power, Inc., Batavia, IL, United States
²Applied Pulsed Power, Inc., Freeville, NY, United States
- 2P-27 Laser Pumping of 5kV Silicon Thyristors for Fast High Current Rise-Times**
H. D. Sanders¹, S. C. Glidden², D. M. Warnow²
¹Solid State Switch Division, Applied Pulsed Power, Inc., Batavia, IL, United States
²Applied Pulsed Power, Inc., Freeville, NY, United States

2P-28 **Attempt to a Non-Destructive Single Event Burnout Test of Fast High Current Thyristors**
V. Senaj, L. Ducimetiere
TE/ABT, CERN, Geneva, Switzerland

Poster Session 2P: **Microwaves II: High Power Microwaves**

Tuesday, June 21 1:30-3:30, Regency Ballroom

Session Chair: Peter Mardahl, Air Force Research Laboratory

2P-29 **Pulse Width of a Reflex Triode Virtual Cathode Oscillator**
A. Roy, A. Sharma, R. K. Menon, S. Mitra, V. Sharma, K. V. Nagesh, D. P. Chakravorthy
Accelerator and Pulse Power Division, Bhabha Atomic Research Centre, Mumbai, India

2P-30 **Investigations of a Double-Gap Vircator at Sub-Microsecond Pulse Durations**
A. S. Shlapakovski, T. Queller, Y. E. Krasik
Physics Department, Technion, Haifa, Israel

2P-31 **Anode Optimization for a Compact Sealed Tube Vircator**
J. Walter, J. Vara, C. Lynn, J. Dickens, A. Neuber, M. Kristiansen
Texas Tech University, Center for Pulsed Power and Power Electronics, Lubbock, TX, United States

2P-32 **Experimental Studies on a Coaxial Vircator, Designed for Operation in TE11 Mode**
M. Elfsberg, T. Hurtig, C. Möller, S. E. Nyholm
Swedish Defence Research Agency, Stockholm, Sweden

2P-33 **Experimental Study of a Vircator with Premodulated Electron Beam**
C. Möller¹, F. Bieth², P. Delmote², M. Elfsberg¹, T. Hurtig¹, S. E. Nyholm¹
¹Defence and Security, Systems and Technology, Swedish Defence Research Agency (FOI), Tumba, Sweden
²High-Power Microwave Group, French-German Research Institute of Saint-Louis (ISL), Saint-Louis, France

2P-34 **Suppression of Leakage Current in a Relativistic Magnetron Using Various Cathode Endcap Designs**
C. J. Leach, S. D. Prasad, M. Fuks, E. Schamiloglu
Electrical and Computer Engineering Dept., University of New Mexico, Albuquerque, NM, United States

2P-35 **3D ICEPIC Simulations of A6 Magnetron with Transparent Cathode for Comparison of 3D MAGIC Simulations**
C. L. Mendonca¹, T. Fleming², S. Prasad¹, E. Schamiloglu¹
¹Electrical and Computer Engineering Department, University of New Mexico, Albuquerque, NM, United States
²Directed Energy Directorate, Air Force Research Laboratory, Albuquerque, NM, United States

2P-36 **RF Frequency Switching in a Relativistic Magnetron with Diffraction Output (MDO)**
M. Liu¹, M. I. Fuks¹, E. Schamiloglu¹, C. -L. Liu²
¹Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM, United States
²Key Laboratory of Physical Electronics and Devices of the Ministry of Education, Xi'an Jiaotong University, Xi'an, China

2P-37 **Metamaterial Cathodes in Multicavity Magnetrons**
A. D. Andreev, K. J. Hendricks
High-Power Microwave Division, Directed Energy Directorate, Air Force Research Laboratory, Kirtland AFB, NM, United States

2P-38 **Mechanism Analysis of a Kind of Diode over-Current Oscillation**
C. Yu
Beijing Institute of Special Electromechanical Technology, Beijing, China

2P-39 High Power Autonomous Pulse-Train Oscillator
E. Nesterov, V. Fortov, Y. Isaenkov, V. Mikhailov, V. Ostashev, Y. Semenov, V. Stroganov
Joint Institute for High Temperatures of Russian Academy of Sciences, Moscow, Russian Federation

2P-40 Comparison and Time Domain Analysis of Two Common Bipolar Forming Methods in UWB Radiators
K. Hojatzadeh
Electronic and Communication Research Center, Tehran, Iran

Poster Session 2P: Accelerators and Beams

Tuesday, June 21 1:30-3:30, Regency Ballroom

Session Chairs: Colin Whyte, University of Strathclyde
Mark Sinclair, AWE

2P-41 Primary Analysis of Switches Trigger Based on Secondary Induced Overvoltage of LTD
P. Liu¹, F. Sun², H. Wei², Q. Qiu¹, Q. Zhang¹
¹Electrical Engineering, Xi'an Jiaotong University, Xi'an, China
²Pulsed Power, Northwest Institute of Nuclear Technology, Xi'an, China

2P-42 Circuit Simulation of Saturn with a Reflex Triode Load
R. J. Allen, B. W. Weber, R. J. Commisso, S. B. Swanekamp, D. P. Murphy
Naval Research Laboratory, Washington, DC, United States

2P-43 A Microsecond LTD Stage Designed as a Prototype for an Upgrade of SPHINX Z-Pinch Driver
F. Lassalle, B. Roques, A. Loyer, T. Chanconie
CEA Gramat, 46500 Gramat, France

2P-44 Investigation of High Current Submicrosecond LTD Stages at CEA Gramat
A. Loyer¹, F. Lassalle¹, B. Roques¹, F. Bayol², A. A. Kim³, B. M. Kovalchuk³
¹CEA Gramat, 46500 Gramat, France
²ITHPP, 46500 Thegra, France
³Institute of High Current Electronics, 634055 Tomsk, Russia

2P-45 A Compact 2MA LTD for High Energy Density Physics Research
S. N. Bland¹, R. B. Spielman², S. V. Lebedev¹, J. Skidmore¹, G. Burdiak¹, J. P. Chittenden¹, P. Cong³
¹Imperial College London, London, United Kingdom
²Ktech Corporation, Albuquerque, NM, United States
³Northwest Institute of Nuclear Technology in China, Xi'an, China

2P-46 Temporally Shaped Current Pulses on a Two-Cavity LTD System
M. E. Savage¹, M. G. Mazarakis¹, K. R. LeChien², W. A. Stygar¹, D. V. Rose³, C. L. Miller³, E. A. Madrid³, W. E. Fowler¹
¹Sandia National Laboratories, Albuquerque, NM, United States
²NNSA, Washington, DC, United States
³Voss Scientific, Albuquerque, NM, United States

2P-47 Circuit Model Development to Improve the Predictability of Shaped Current Pulses on Z
P. A. Corcoran¹, J. P. Davis¹, M. Savage², B. Whitney¹, I. Smith¹, D. Hinshelwood³, B. Stoltzfus², H. Hanshaw², R. Lemke², K. Struve², V. Bailey¹, E. Neau¹, T. Wagoner², C. Jennings², W. Stygar²
¹L-3 Communications/Pulse Sciences, San Leandro, CA, United States
²Sandia National Laboratory, Albuquerque, NM, United States
³Naval Research Laboratory, Washington, DC, United States

2P-48 A Novel High Performance Thyatron Tube Driver
C. -Y. Liu
Power Supply Group, National Synchrotron Radiation Research Center, Hsinchu, Taiwan

- 2P-49 On the Dynamics of the Flow along a Cylindrical Self Magnetically Insulated Transmission Line**
J. G. Leopold, R. Gad, I. Navon
Dept. of Applied Physics, RAFAEL Labs, Haifa, Israel
- 2P-50 The Flow Dynamics Along Non-Uniform Self Magnetically Insulated Transmission Lines**
J. G. Leopold, R. Gad, I. Navon
Dept. of Applied Physics, RAFAEL Labs, Haifa, Israel
- 2P-51 PIC Simulations of Power Flow in a Linear Transformer Driver for Radiographic Applications**
T. D. Pointon, D. B. Seidel, J. J. Leckbee, B. V. Oliver
Sandia National Laboratories, Albuquerque, NM, United States
- 2P-52 Compact High Average Gradient Particle Accelerators Utilizing Photoconductive Switches**
O. S. Zucker
Polarix Corporation, San Diego, CA, United States
- 2P-53 AMBICA-600: A Waterline Driven Gigawatt Pulsed Electron Beam Accelerator**
R. Verma¹, A. Shyam², T. Patel¹, Y. C. Saxena¹
¹Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India 382428
²Bhabha Atomic Research Center, Autonagar, Vishakapatnam,, Andhra Pradesh, India - 530012
- 2P-54 Initial Tests of the AWE Hydrus IVA Marx**
T. Warren¹, T. DaSilva¹, J. Wilson¹, K. Hanzel¹, V. Carboni¹, D. Spelts¹, J. Pearce¹, W. Saunders¹, W. Glazebrook¹, K. Thomas², P. Beech², S. Clough², I. Crotch², S. Brown², B. Stringer², C. Goes², A. King², I. Huckle², J. Burscough², S. Trenman², J. Duffy², R. Wheeldon²
¹L-3 Communications/Pulse Sciences, San Leandro, CA, United States
²Atomic Weapons Establishment, Aldermaston, Berkshire, United Kingdom
- 2P-55 Solid State Pulsed Power System for 50 MW X-Band Klystron**
T. L. Houck, G. G. Anderson, S. G. Anderson, C. P. J. Barty, G. K. Beer, R. R. Cross, G. A. Deis, C. A. Ebberts, D. J. Gibson, F. V. Hartemann, R. A. Marsh
National Ignition Facility/Photon Science and Applications, Lawrence Livermore National Laboratory, Livermore, CA, United States
- 2P-56 The Pulsed Kicker Power Supply Design for TPS Synchrotron Light Source**
Y. -H. Liu, C. -S. Chen
Utility Group, National Synchrotron Radiation Research Center, Hsinchu City, Taiwan
- 2P-57 Manufacture of a Scanning Magnet Power-Supply Used in Industrial Radiation Accelerator**
C. Yu
Beijing Institute of Special Electromechanical Technology, Beijing, China
- 2P-58 MAGIC Implicit Particle Pusher Description and Validation**
A. J. Woods, L. D. Ludeking
Missile Products, ATK, Newington, VA, United States
- 2P-59 Phenomena Succession at Generation of Picosecond Runaway Electrons Beam in Air**
M. I. Yalandin¹, A. G. Reutova¹, K. A. Sharypov¹, V. G. Shpak¹, S. A. Shunailov¹, G. A. Mesyats²
¹Laboratory of Electron Accelerators, Institute of Electrophysics, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russian Federation
²Dept. of Physical Electronics, Lebedev Physical Institute of Russian Academy of Sciences, Moscow, Russian Federation
- 2P-60 Laser Excitation of Electrostatic Eigen Mode of a Plasma in Azimuthal Magnetic Field and Electron Acceleration**
M. Kumar, V. K. Tripathi
Physics, IIT Delhi, New Delhi, India
- 2P-61 Controlling Feed Electron Flow in MITL-Driven Radiographic Diodes**
D. B. Seidel, T. D. Pointon, B. V. Oliver

Advanced Radiographic Technologies Dept., Sandia National Laboratories*, Albuquerque, NM, United States

- 2P-62** **Plasma Lens for Transformation of Ion Beams**
V. D. Bochkov¹, A. A. Drozdovskii², A. A. Golubev², D. D. Iosseliani², Y. B. Novozhilov², S. M. Savin², V. V. Yanenko²
¹Pulsed Technologies Ltd., Ryazan, Russian Federation
²SSC RF Institute for Theoretical and Experimental Physics, Moscow, Russian Federation
- 2P-63** **Investigation of the Mechanism of Electron Current Suppression in an Ion Diode with Magnetic Self – Isolation**
A. Pushkarev, Y. Isakova, V. Guselnikov
Tomsk Polytechnic University, Tomsk, Russian Federation
- 2P-64** **Investigation of a Novel Cathodes for Microsecond Pulse Conditions**
P. Norgard, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 2P-65** **The Study of Pulsed Explosive Ion Emission**
A. Korenev, S. Korenev
Beam & Plasma Technologies, Inc, Mundelein, IL, United States
- 2P-66** **Low-Energy Electron Beam Source**
J. Gleizer, V. Vekselman, S. Yatom, J. Felsteiner, Y. Krasik
Physics, Technion, Haifa, Israel
- 2P-67** **Shielded-Grid Triode Eliminates Beam-Interception Switching Losses**
K. E. Williams
Applied Science and Engineering, LLC, Hartford, WI, United States
- 2P-68** **Sub-Nanosecond Electron Emission from Electrically Gated Field Emitting Arrays**
M. Paraliiev¹, S. Tsujino², C. Gough¹, E. Kirk², S. Ivkovic¹
¹RF Section, Pulsed Magnets Group, Paul Scherrer Institute, Villigen PSI, Switzerland
²Laboratory for Micro-& Nanotechnology, Field-Emitter Group, Paul Scherrer Institute, Villigen PSI, Switzerland
- Poster Session 2P:** **Pulsed Power Systems I: Electromagnetic Launch, Generators and Networks, and Lasers**
- Tuesday, June 21 1:30-3:30, Regency Ballroom
- Session Chair: Minh Nguyen, SLAC National Accelerator Laboratory
- 2P-69** **Transmission Line and Electromagnetic Models of the Mykonos-2 Accelerator**
E. A. Madrid¹, C. L. Miller¹, D. V. Rose¹, D. R. Welch¹, R. E. Clark¹, C. B. Mostrom¹, W. A. Stygar², M. E. Savage², D. D. Hinshelwood³, K. R. LeChien⁴
¹Voss Scientific, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States
³Naval Research Laboratories, Washington, DC, United States
⁴National Nuclear Security Administration, Washington, DC, United States
- 2P-70** **A Versatile Marx Generator for Use in Directed Energy and Effects Testing Applications**
T. A. Holt, J. R. Mayes, M. B. Lara, C. Nunnally, J. M. Byman, C. W. Hatfield
APELC, Austin, TX, United States
- 2P-71** **Improvements to a Small Scale Linear Transformer Driver**
D. W. Bolyard, A. Neuber, J. Krile, M. Kristiansen
Department of Electrical and Computer Engineering, Texas Tech University, Center for Pulsed Power and Power Electronics, Lubbock, TX, United States
- 2P-72** **Design of a Non-Circular Linear Transformer Driver**
K. Morales¹, B. Hilko²

¹Directed Energy Integration Branch, Naval Surface Warfare Center, Dahlgren, VA, United States
²Envisioneering, Inc., Alexandria, VA, United States

- 2P-73 Pulsing Characteristics of RF Amplifier Topologies**
A. Eroglu
Engineering Department, Indiana University - Purdue University Fort Wayne, Fort Wayne, IN, United States
- 2P-74 Square Pulse LTD**
A. A. Kim¹, M. G. Mazarakis², V. A. Sinebryukhov¹, V. M. Alexeenko¹, S. S. Kondratiev¹, W. A. Stygar²
¹Institute of High Current Electronics, Tomsk, Russian Federation
²Sandia National Laboratories, Albuquerque, NM, United States
- 2P-75 10 Ohm High Voltage Subnanosecond Pulse Generation**
S. El Amari, D. Arnaud-Cormos, P. Leveque, V. Couderc
Limoges University - XLIM, Limoges, France
- 2P-76 Generators of High-Power High-Frequency Pulses Based on Sealed-off Discharge Chambers with Hollow Cathode**
V. D. Bochkov¹, V. G. Ushich¹, A. E. Dubiniv², I. Y. Kornilova², I. L. L'vov², S. A. Sadovoy², V. D. Selemir², D. V. Vyalykh², V. S. Zhdanov²
¹Pulsed Technologies Ltd., Ryazan, Russian Federation
²Russian Federal Nuclear Center - All-Russian Research Institute for Experimental Physics, Sarov, Russian Federation
- 2P-77 High-Current Pulse Generator for Plasma Focus**
A. V. Nashilevskiy¹, V. P. Vinogradov², G. G. Kanaev¹, V. I. Krauz², G. G. Remnev¹
¹National Research Tomsk Politechnic University, Tomsk, Russian Federation
²Russian Research Center "Kurchatov Institute", Moscow, Russian Federation
- 2P-78 Pulsed Power Generator Driven by FPGA and PC**
M. Akiyama¹, T. Goh¹, M. Suemitsu², T. Sakamoto², H. Akiyama², T. Ueno³
¹Ichinoseki National College of Technology, Iwate, Japan
²Kumamoto University, Kumamoto, Japan
³Oita National College of Technology, Oita, Japan
- 2P-79 A FPGA Based All-Solid State Nanosecond Pulsed-Power Generator**
C. Yao, X. Zhang, C. Li, F. Guo, Y. Mi, C. Sun
Chongqing University, Chongqing, China
- 2P-80 Inductive Adder Based Method for Generating Electromagnetic Pulse with Controllable Timing**
Z. Wang, X. P. Yan, P. Li, X. H. Hao, C. D. Yu, J. T. Wang
State Key Laboratory for Mechatronical Engineering and Control, Beijing Institute of Technology, Beijing, China
- 2P-81 Development of 20kj Fast Driver for Nx-3 Plasma Focus**
R. Verma^{1,2}, T. L. Tan¹, P. Lee¹, A. Talebitaher¹, H. B. M. Shariff¹, S. V. Springham¹, A. Shyam³, R. Rawat¹
¹Natural Sciences and Science Education, National Institute of Education, Nanyang Technological University, Singapore, Singapore
²Institute for Plasma Research, Bhat, Gandhinagar, India
³Energetics and Electromagnetic Division, Bhaba Atomic Research Centre, Autonagar, Vishakhapatnam, India
- 2P-82 High Current All Solid State Sources for Laser Applications**
V. Efanov, M. Efanov, P. Yarin
FID GmbH, Burbach, Germany
- 2P-83 Study of the Discharge Channel Evolution Characteristics in the Flashlamps**
X. Li¹, S. Jia¹, R. Li¹, X. Song¹, Z. Shi¹, H. Li²

¹School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, China

²Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Shanghai, China

- 2P-84 Comparative Analysis of High Velocity Projectile Images Using MATLAB**
B. M. Huhman¹, A. Choi²
¹Plasma Physics Division, US Naval Research Laboratory, Washington, DC, United States
²Global Strategies Group, Crofton, MD, United States
- 2P-85 Application Based General Scaling in Railguns**
V. W. Sung, W. G. Odendaal
Dept. of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States
- 2P-86 Sliding Electrical Contact Test Stand Development**
D. A. Rice, S. D. Kovaleski, J. M. Gahl
Electrical Engineering, University of Missouri, Columbia, Mo, United States
- 2P-87 Low Voltage Low Current Massively Parallel High Performance EM Gun Topology MEMS Based Manufacturing**
O. S. Zucker
Polarix Corporation, San Diego, CA, United States
- 2P-88 Control of Thermal Limitations in Railguns**
G. A. Shvetsov¹, S. V. Stankevich¹, A. G. Anisimov¹, S. V. Sinyaev²
¹Lavrentyev Institute of Hydrodynamics, Novosibirsk, Russian Federation
²Institute of Applied Mathematics and Mechanics, Tomsk State University, Tomsk, Russian Federation
- 2P-89 Modeling of High Voltage Fast Recovery Diode in Pulsed Power Applications**
Y. Zhou^{1,2,3}, P. Yan¹, W. Yuan¹, D. Zhang¹
¹Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing, China
²Graduate School, Chinese Academy of Sciences, Beijing, China
³School of Automation and Electrical Engineering, Tianjin University of Technology and Education, Tianjin, China
- 2P-90 Finite Element Analysis of 3-D Eddy Field on New Type of Intercepting Missile in the Electromagnetic Launching**
P. Sun
Machinery and Electronics Engineering, Shijiazhuang Mechanical Engineering College, Shijiazhuang, China
- 2P-91 Structural Optimization of the Single-Stage Induction Coilgun Based on Finite Element Method**
B. Zou
Naval Aeronautical and Astronautical University, Yantai, Shandong, China
- 2P-92 Design of a Single Stage Supersonic Reluctance Coilgun**
T. S. El-Hasan
Electrical Engineering, Zarqa University, Zarqa, Jordan
- 2P-93 Analysis of a Linear Reluctance Motor for Aircraft Electromagnetic Launcher**
M. Mirzaei¹, S. E. Abdollahi², M. Ghodsi³
¹Electrical Engineering, Amirkabir University of Technology, Tehran, Iran
²Electrical Engineering, University of Tehran, Tehran, Iran
³Mechanical Engineering, Tarbiat Modares University, Tehran, Iran

Session 4A: Radiation Sources I: Z and X-Pinches and Lasers

Tuesday, June 21 3:30-5:45, Conference Center 10A-B

Session Chair: Victor Kantsyrev, University of Nevada – Reno

- 3:30 4B-1 New Self-Magnetically Insulated Connection of Multi-Level Accelerators to a Common Load for Fusion**
J. P. VanDevender¹, W. L. Langston², M. F. Pasik², R. S. Coats², T. D. Pointon², D. B. Seidel², G. R. McKee², L. X. Schneider²
¹VanDevender Enterprises, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States
- 3:45 4B-2 Inverse Diode for Combination of Multiple Modules and Fusion Driver-Target Standoff**
J. P. VanDevender¹, D. B. Seidel², K. A. Mikkelson², R. D. Thomas², V. J. Harper-Slaboszewicz², B. P. Peyton³
¹VanDevender Enterprises, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States
³Ktech Corporation, Albuquerque, NM, United States
- 4:00 4B-3 The Development of a 2.4 MJ Pulsed Power Supply for the Production of a Compact Toroid Plasma**
W. Zawalski, M. Laberge, S. Howard, M. Wight, K. Epp, A. Wong
 General Fusion Inc., Vancouver, Canada
- 4:15 4B-4 High Energy Densities and MAGO/MTF**
S. F. Garanin
 ITMF, All-Russian Research Institute of Experimental Physics (VNIIEF), Sarov, Nizhny Novgorod Region, Russian Federation
- 4:30 4B-5 Simulation of Diocotron Instability in a Magnetically Confined Hollow Electron Beam**
H. J. Lee¹, M. Chung², S. I. Chung¹
¹Department of Electrical Engineering, Pusan National University, Busan, South Korea
²Handong University, Pohang, South Korea
- 4:45 4B-6 Substrate Conditions in Low-Temperature Gallium Arsenide and Semi-Insulating Gallium Arsenide During Terahertz Pulse Generation**
S. Ray¹, A. K. Alla¹, J. Yakura², P. Kirawanich³, N. E. Islam¹
¹ECE, University of Missouri, Columbia, MO, United States
²ECE, Air Force Research Laboratory, Albuquerque, NM, United States
³EE, Mahidol University, Salaya, Nakhom Pathom, Thailand
- 5:00 4B-7 Compact Nanosecond FID Pulse Generators for Accelerators, Laser and Discharge Applications**
V. Efanov, M. Efanov, A. Kriklenko, A. Komashko, P. Yarin, S. Zazoulin
 FID GmbH, Burbach, Germany
- 5:15 4B-8 Meridian Radar System - Klystron Based Transmitter for Atmospheric Research**
P. Kolda¹, S. Lenci¹, Z. H. Ding², M. Kempkes³, K. Schrock³
¹Communications and Power Industries, Palo Alto, CA, United States
²China Research Institute of Radiowave Propagation, Qingdao, China
³Diversified Technologies, Inc., Bedford, MA, United States

Session 4C: Components III: Arc Discharge Switching

Tuesday, June 21 3:30-5:30, Conference Center 11A-B

Session Chair: Mark Savage, Sandia National Laboratories

- 3:30 4C-1 Simulation of a 1.0-MA Current Joint with ALE3D**
J. B. Javedani, J. M. Solberg, R. N. Rieben, D. A. White, D. A. Goerz
 Engineering, Lawrence Livermore National Laboratory, Livermore, CA, United States
- 3:45 4C-2 The Triggered Behaviour of a Controlled Corona Stabilised Cascade Switch**
M. J. Given¹, M. P. Wilson¹, I. V. Timoshkin¹, T. Wang¹, S. J. MacGregor¹, J. M. Lehr²
¹University of Strathclyde, Glasgow, United Kingdom
²Sandia National Laboratories, Albuquerque, NM, United States

- 4:00** **4C-3 Triggered Vacuum Switch and Air Spark Gap for Pulsed Power Applications**
X. Duan, M. Liao, J. Zou, C. Zhao, Z. Zhou
School of Electrical Engineering, Dalian University of Technology, Dalian, China
- 4:15** **4C-4 Arc Motion Simulation in a Rotating Arc Gap Switch Based on a Chain Model**
H. Junjia, G. Rui, P. Yuan
College of Electrical & Electronic Engineering, Huazhong University of Science & Technology, Wuhan, China
- 4:30** **4C-5 (INVITED) High Pressure Sealed Hydrogen Spark Switches**
S. D. Rendall, Z. Shotts, F. Rose, Z. Roberts
Radiance Technologies, Huntsville, AL, United States
- 5:00** **4C-6 Stabilities of Water Switches with Three Different Field Distributions**
P. Cong, G. Zhang, L. Sheng
Northwest Institute of Nuclear Technology, Xi'an, China
- 5:15** **4C-7 Study on the Saturation Phenomena of Discharge Channel Number of a Gas Spark Switch Gap Under Nanosecond Trigger Pulses**
J. Chang, H. Wang, Q. Zhang, A. Qiu
School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China

WEDNESDAY, JUNE 22

Session PL3: Marx Award Winner

Patrick A. Corcoran, L-3 Communications, Pulse Sciences

“Practical Circuit Models and Simulations using Transmission Lines”

Wednesday, June 22 8:00-8:50, Conference Center 12A-D

Session 5A: Accelerators and Beams II: High Energy Accelerators, Particle Beams, and Free Electron Lasers

Wednesday, June 22 9:30-12:00, Conference Center 10A-B

Session Chair: Frédéric Bayol, ITHPP

9:30 **5A-1 Extension of the Operating Point of the Mercury IVA from 6 to 8 MV**

R. J. Allen, R. J. Commisso, G. Cooperstein, P. F. Ottinger, J. W. Schumer
Naval Research Laboratory, Washington, DC, United States

9:45 **5A-2 Status of the AWE Hydrus Fabrication**

K. J. Thomas¹, P. F. Beech¹, S. G. Clough¹, I. Crotch¹, S. Brown¹, B. Stringer¹, C. Goes¹, A. King¹,
I. Huckle¹, J. Burscough¹, S. Trenaman¹, J. Duffy¹, R. Whealdon¹, W. Glazebrook², V. Carboni²,
T. DaSilva², J. Pearce², W. Saunders²

¹Hydrodynamics/DMP, AWE, Reading, Berks UK, United Kingdom

²Pulse Sciences, L-3 Communications, San Leandro, CA, United States

10:00 **5A-3 Design and Performance of the Darht Second Axis Accelerator**

K. Nielsen

Los Alamos National Laboratories, Los Alamos, NM, United States

10:15 **5A-4 FXR Marx Triggering and Switch Characterization**

L. K. Tully, M. M. Ong, J. M. Zentler, B. R. Kreitzer, J. E. Dunlap

Lawrence Livermore National Laboratory, Livermore, CA, United States

10:30 **5A-5 Xray Diodes Experiments on the Asterix Generator**

B. Etchessahar¹, R. Rosol¹, R. Nicolas¹, L. Hourdin¹, F. Poulet¹, L. Magnin¹, F. Cartier¹,
D. Collignon¹, T. Somerlinck¹, M. Caron¹, B. Cassany², L. Voisin², T. Desanlis², B. Bicrel²,
P. Modin², A. Garrigues³, C. Delbos³, I. Soleilhavoup³

¹DIF / PEM, CEA, 51490Ponfaverger-Moronvilliers, France

Physics Division, Los Alamos National Laboratory, Los Alamos, NM, United States

- 11:15** **5B-7 Characteristics of High Voltage Electrical Discharge Induced Non-Thermal Plasma in Aqueous Solution under Pulsed Control**
K. -Y. Shih, S. Iyonaga, M. Akiyama, N. Aoki, H. Akiyama
GCOE, Kumamoto University, Kumamoto, Japan
- 11:30** **5B-8 Gas Temperature Measurements of Nano-Seconds Pulsed Discharge Based Ozonizer**
T. Matsumoto¹, N. Takamura¹, D. Wang², T. Namihira³, H. Akiyama¹
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Priority Organization for Innovation and Excellence, Kumamoto University, Kumamoto, Japan
³Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 11:45** **5B-9 Simulation and Analysis of Magnetically-Applied-Pressure-Shear (MAPS) Experiments**
T. A. Hail, C. S. Alexander, J. R. Asay
Pulsed Power Sciences Center, Sandia National Laboratories, Albuquerque, NM, United States
- Session 5C:** **Components IV: Solid State Switching**
- Wednesday, June 22 9:30-12:00, Conference Center 11A-B
- Session Chair: Darryl Droemer, National Security Technologies
- 9:30** **5C-1 Laser Enhanced Diffusion of Nitrogen in High Purity Semi-Insulating 4H Silicon Carbide Substrates for Non-Rectifying Contact Formation to Photoconductive Semiconductor Switches**
W. Sullivan III, C. Hettler, J. Dickens
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 9:45** **5C-2 Analysis of Silicon Carbide JFET Devices During Pulsed Operation**
K. J. Lawson¹, G. Alvarez¹, S. B. Bayne¹, V. Veliadis², D. Urciuoli³
¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
²Northrop Grumman Electronic Systems, Linthicum, MD, United States
³U.S. Army Research Laboratory, Adelphi, MD, United States
- 10:00** **5C-3 Recombination Lifetime Modification in Bulk, Semi-Insulating 4H-SiC Photoconductive Switches**
C. Hettler, W. Sullivan III, J. Dickens
Texas Tech University, Lubbock, TX, United States
- 10:15** **5C-4 Development of "Stitch" Super-GTOs for Pulsed Power**
H. K. O'Brien¹, A. Ogunniyi¹, C. J. Scozzie¹, W. Shaheen², V. Temple³
¹RDRL-SED-P, US Army Research Laboratory, Adelphi, MD, United States
²Berkeley Research Associates, Beltsville, MD, United States
³Silicon Power Corporation, Clifton Park, NY, United States
- 10:30** **5C-5 (INVITED) High Current, Multi-Filament Photoconductive Semiconductor Switching**
F. J. Zutavern, S. F. Glover, A. Mar, G. M. Loubriel, M. E. Swalby, R. T. Collins
Sandia National Laboratories, Albuquerque, NM, United States
- 11:00** **5C-6 Novel Press Pack IGBT Device and Switch Assembly for Pulse Modulators**
P. Bill, A. Welleman, E. Ramezani, S. Gekenidis, R. Leutwyler
Semiconductors, ABB Switzerland Ltd., Lenzburg, Switzerland
- 11:15** **5C-7 Testing of a Low Inductance Stacked Mosfet Switch for Pulsed Ring-Down Sources**
D. Reale, J. Mankowski, S. Holt, J. Walter, J. Dickens
Center for Pulsed Power and Power Electronics, Dept. of Electrical and Computer Engineering,
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- 11:30** **5C-8 Ceramic Packaging Reliability Study of a 13.5 kV Multichip Thyristor**
B. Vergne¹, C. Gauthier-Blum¹, V. Brommer¹, S. Scharnholz¹, E. Spahn¹, A. Welleman²

¹French-German Research Institute of Saint-Louis (ISL), Saint-Louis, France

²ABB Switzerland Ltd, Semiconductors, Lenzburg, Switzerland

11:45 5C-9 On-State Resistance Comparison of Semi-Insulating 6H-SiC Photoconductive Semiconductor Switches

J. Yuan, H. Liu, J. Liu, H. Li, W. Xie

Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China

Poster Session 3P: Radiation Sources

Wednesday, June 22 1:30-3:30, Regency Ballroom

Session Chair: Ronnie Shepherd, Lawrence Livermore National Laboratory

3P-1 Xenon Theta Pinch for ICF Chamber Environment Experiments

M. A. Rhodes, J. Kane, G. Loosmore, J. Latkowski

Lawrence Livermore National Laboratory, Livermore, CA, United States

3P-2 The High-Intensity Leopard Laser for High Energy Density Physics Research in Nevada Terawatt Facility

P. P. Wiewior, A. Covington

Nevada Terawatt Facility, University of Nevada-Reno, Reno, NV, United States

3P-3 Concept Design of Z-Pinch Accelerator for ICF

M. Wang, W. Zou, L. Chen, L. Zhou, W. Xie

Pulsed Power Lab., Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, Sichuan, China

3P-4 Extreme State of Water Produced by Converging Strong Shock Waves Generated Using Underwater Electrical Wire Array Explosion

Y. E. Krasik, A. Fedotov-Gefen, S. Efimov, L. Gilburd, V. Gurvich, G. Bazalitsky

Physics, Physics Department, Haifa, Israel

3P-5 Correlation Between Dd Fusion Source and X-Ray Images in Plasma Focus Device

A. Talebitaher, P. M. E. Shutler, S. V. Springham, P. Lee, R. S. Rawat

NIE, NTU, Singapore, Singapore

3P-6 X-Ray Radiography of the Evolution of Wire Explosion in Vacuum Using X-Pinch Radiation

X. Zhu, R. Zhang, H. Luo, X. Zou, X. Wang

Department of Electrical Engineering, Tsinghua University, Beijing, China

3P-7 A High-Brightness Diode Laser with Kilowatt-Class Peak Output Power

Y. Xiao¹, M. Kanskar¹, D. Olson¹, T. Garrod¹, D. Kedlaya¹, S. H. Macomber²

¹Alfalight Inc., Madison, WI, United States

²Macomber Research, Tucson, AZ, United States

3P-8 Possible Way to Creation of an Effective Discharge-Pumped 13.4 nm Laser on Hydrogen-like Ions of Nitrogen

V. A. Burtsev, N. V. Kalinin

Efremov Scientific Research Institute of Electrophysical Apparatus, Saint Petersburg, Russian Federation

3P-9 Gas Lasers Pumped by the Generators with Inductive Energy Storage and Semiconductor Opening Switch

V. F. Tarasenko, A. N. Panchenko, A. E. Tel'minov

High Current Electronics Institute, Tomsk, Russian Federation

3P-10 Integrated Capacitor Charging Power Supply and Marx Bank with Galvanic Isolation

D. M. Johns

Engineering, Kaiser Systems, Inc., Beverly, MA, United States

- 3P-11 Diode Particle Simulation Result Comparison with 2-D and 3-D Simulations by Using LSP and MCNP Codes**
S. H. Han, S. H. Beak, S. H. Hong, J. Lee
 Agency for Defense Development, Yuseong, Daejeon, South Korea
- 3P-12 Extending Component Lifetime in a Repetitively Pulsed, High Power Vacuum Diode**
M. C. Myers¹, J. Dubinger¹, J. L. Giuliani¹, F. Hegeler², A. Mangassarian³, S. P. Obenschain¹,
 J. D. Sethian¹, W. Webster⁴, M. F. Wolford¹
¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States
²Commonwealth Technology, Inc., Alexandria, VA, United States
³Science Applications International Corporation, McLean, VA, United States
⁴Research Support Instruments, Lanham, MD, United States
- 3P-13 Diagnostic Measurements on Explosive Emission Cathodes Operating at High Current Densities and UHV Pressures**
C. F. Lynn, J. Walter, A. Neuber, M. Kristiansen
 Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States
- Poster Session 3P: Applications II: Medical, Biological, Environmental, and General**
 Wednesday, June 22 1:30-3:30, Regency Ballroom
 Session Chair: Jennifer Zirnheld, University of Buffalo
- 3P-14 A Plasma Compact Source of Low Concentration of NOx**
S. Korenev
 Caterpillar Inc., Mossville, IL, United States
- 3P-15 The Properties of Millisecond Pulsed Electrical Discharge in Mixing Air and Diesel Fuel**
S. Korenev, J. Love
 Caterpillar Inc., Mossville, IL, United States
- 3P-16 Pulse-Periodic Corona Discharges for Air Flow Control and Decontamination**
I. V. Timoshkin, M. Maclean, M. J. Given, M. P. Wilson, T. Wang, S. J. MacGregor, J. G. Anderson
 Electronic and Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom
- 3P-17 The Effect of the Rate of Temperature Rise on Cell Survival**
S. Xiao^{1,2}, T. J. Camp¹, Y. Jing¹, K. H. Schoenbach^{1,2}
¹Frank Reidy Research Center for Bioelectrics, Old Dominion University, Norfolk, VA, United States
²Department of Electrical and Computer Engineering, Old Dominion University, Norfolk, VA, United States
- 3P-18 Pulsed Discharges in Tissue**
J. F. Kolb, J. Zhuang, X. Chen
 Center for Bioelectrics, Old Dominion University, Norfolk, VA, United States
- 3P-19 IGBT HV Pulse Generator for High Conductivity Liquid Food Treatment**
M. S. Moonesan, J. F. Zhang, S. H. Jayaram
 ECE - Power Engineering, University of Waterloo, Waterloo, ON, Canada
- 3P-20 A Study of Material Incorporation for Medaka (*Oryzias latipes*) Eggs by Various Voltage Pulses**
S. Kono¹, A. Yamaguchi¹, T. Tanabe¹, N. Tominaga¹, H. Akiyama²
¹Electrical Engineering, Ariake National College of Technology, Omuta, Fukuoka, Japan
²Graduate School of Science and Technology, Kumamoto University, Kumamoto, Kumamoto, Japan
- 3P-21 Dependence of the Type A Measurement Uncertainty on the Size of Ionization Chamber**
K. Stankovic, M. Vujisic, P. Osmikrovic
 Faculty of Electrical Engineering, University of Belgrade, Belgrade, Serbia
- 3P-22 Effect of Pulsed Electric Fields In Human Blood Cells**

B. Baptista¹, V. Dores¹, T. Pinheiro^{2,1}, M. L. Botelho¹, H. Canacsinh^{2,3}, L. M. Redondo^{2,3}

¹Instituto Tecnológico e Nuclear, Sacavem, Portugal

²Nuclear Physics Center from Lisbon University, Lisbon, Portugal

³Lisbon Superior Engineering Institute, Lisbon, Portugal

- 3P-23 High Voltage Pulse Generator Based on TPI-Thyratrons for Pulsed Electric Field Milk Processing**
V. D. Bochkov¹, D. V. Bochkov¹, I. N. Gnedin¹, Y. B. Makeev¹, G. M. Vasiliev², S. A. Zhdanok²
¹Pulsed Technologies Ltd., Ryazan, Russian Federation
²A.V. Luikov Heat & Mass Transfer Institute National Academy of Sciences of Belarus, Minsk, Republic Of Belarus
- 3P-24 Stimulation of HeLa Cells by Intense Pulsed Ultraviolet Radiation from Z-Pinch Plasma**
P. Lu¹, T. Watanabe¹, K. Mitsutake¹, S. Katsuki², H. Akiyama^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-25 Optimization of Regime Parameters for Electro-Discharge Water Treatment**
Y. Y. Livshiz, A. B. Izhar
WADIS Ltd., Herzelia, Israel
- 3P-26 Simulation of Burst Electromagnetic Waves Inside a Human Body for Medical Applications**
H. Ishizawa, M. Hashimoto, H. R. Hosseini, S. Katsuki, H. Akiyama
Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
- 3P-27 Magnet Driver for Producing Ultra-High Gradient Magnetic Fields for Magnetic Resonance Imaging**
H. D. Sanders¹, D. M. Warnow¹, S. C. Glidden¹, I. N. Weinberg², P. Stepanov², S. Fricke³,
A. McMillan⁴, R. Gullapalli⁴, P. M. Starewicz⁵, W. F. B. Punchard⁵, K. -M. Lo⁵
¹Applied Pulsed Power, Inc., Freeville, NY, United States
²Weinberg Medical Physics LLC, Bethesda, MD, United States
³Children's National Medical Center, Washington, DC, United States
⁴University of Maryland, Baltimore, MD, United States
⁵Resonance Research Inc., Billerica, MA, United States
- 3P-28 Focusing System of Burst Electromagnetic Waves for Medical Applications**
M. Hashimoto¹, H. Ishizawa¹, H. Akiyama^{1,2}, H. Hosseine^{1,2}, S. Katsuki^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto City, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto City, Japan
- 3P-29 Development of a Cluster Burst Pulse Generator Based on a SOS Diode Switch for Bioelectrics Applications**
T. Toyooka, Y. Minamitani
Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan
- 3P-30 The Investigation of the Proceeding Route of the Pulse Streamer Discharge in the Water Treatment by Pulsed Discharge in Air with Droplets of Water**
T. Yamada, N. Tomaru, Y. Minamitani
Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan
- 3P-31 Detection of Neutrons Around a High-Energy Accelerator**
H. Snyder, P. Berry, G. Dale, W. Myers
Advanced Nuclear Technology, Los Alamos National Laboratory, Los Alamos, NM, United States
- 3P-32 Sub-Microsecond Impulsive Corona Discharges for Electrostatic Precipitation Applications**
A. C. Mermigkas, I. V. Timoshkin, S. J. MacGregor, M. J. Given, M. P. Wilson, T. Wang
Electronic and Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom
- 3P-33 Gene Analysis of HeLa Cells Subjected to Intense Burst Sinusoidal Electric Fields**
M. Yano¹, C. Matsumoto², N. Tanaka², T. Oide², K. Abe³, S. Katsuki³, H. Akiyama³
¹New Frontier Sciences, Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan

²Computer Science and Electrical Engineering, Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan

³Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan

- 3P-34 Toluene Decomposition Using Nano-Seconds Pulsed Discharge**
Y. Araki¹, D. Wang², T. Namihira³, H. Akiyama¹
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Priority Organization for Innovation and Excellence, Kumamoto University, Kumamoto, Japan
³Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-35 Investigation of Outflow Conditions in Foods of Contents Inside Bacteria by Pulsed Electric Field Sterilization**
K. Shinagawa¹, M. Kataoka¹, T. K. Tatsuro Kijima¹, Y. Takatsuka¹, Y. Minamitani¹, Y. Komatsu²
¹Graduate School of Science and Engineering, Yamagata University, 4-3-16 Jonan Yonezawa, Yamagata 992-8510 Japan
²Meiji Dairies Corporation, 540 Naruda Odawara, Kanagawa 250-0862 Japan
- 3P-36 Model Study of Dielectrophoresis and Electrorotation of Biological Cells After nsPEF Induced Electroporation**
Q. Hu¹, O. Fadiran¹, W. Li¹, R. P. Joshi²
¹School of Engineering and Technology, Central Michigan University, Mt. Pleasant, MI, United States
²Electrical and Computer Engineering, Old Dominion University, Norfolk, VA, United States
- 3P-37 A Wideband Exposure System for In-Vitro Cell Study**
S. Xiao^{1,2}, Y. Sun¹, K. H. Schoenbach^{1,2}
¹Old Dominion University, Frank Reidy Research Center for Bioelectrics, Norfolk, VA, United States
²Old Dominion University, Department of Electrical and Computer Engineering, Norfolk, VA, United States
- 3P-38 Study of Underwater Shock Wave Induced Embryonic Modification In-vivo**
Y. Miyamoto¹, S. H. R. Hosseini^{1,2}, D. K. Kang¹, Y. Okuda¹, D. Oshita¹, H. Akiyama^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-39 Visualization and Analysis of Underwater Shock Wave Focusing Generated by Magnetic Pulse Compression(MPC)**
D. Oshita¹, S. H. R. Hosseini^{2,1}, Y. Okuda¹, Y. Miyamoto¹, S. Iwasaki¹, H. Akiyama^{2,1}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-40 Window Effect of Tumor Cell Apoptosis with Nanosecond Pulsed Electric Field**
C. Li¹, C. Yao¹, F. Guo¹, Y. Mi¹, C. Sun¹, Y. Wen², J. Tang²
¹State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing, China
²Second Affiliated Hospital of Chongqing Medical Science University, Chongqing, China
- 3P-41 Treatment of Cancer Cells Using a Pulsed Power Plasma Source**
M. Thiyagarajan, L. Waldbeser, A. Whitmill
Plasma Engineering & Research Lab, Texas A&M University - Corpus Christi, Corpus Christi, TX, United States
- 3P-42 Production of Uniform Underwater Shock Waves by Pulsed Electric Discharge**
Y. Okuda¹, S. H. R. Hosseini², D. Oshita¹, S. Iwasaki¹, T. Sakugawa¹, H. Akiyama¹
¹Pulsed Power Laboratory, Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
- 3P-43 Gene Expression Analysis of Apoptosis Pathway in HeLa S3 Cells Subjected to Nanosecond Pulsed Electric Fields**

M. Yano¹, M. Yano¹, K. Abe², S. Katsuki^{1,2}, H. Akiyama^{1,2}

¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan

²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan

- 3P-44 Study of Nanosecond Pulsed Power Transmission Technique and its Application to Ozone Production**
T. Kageyama, R. Mabuchi, K. Teranishi, N. Shimomura
University of Tokushima, Tokushima, Japan
- 3P-45 Effects of Pulsed Electric Field Number on Embryonic Development of *Oryzias Latipes***
M. Yamanaka¹, S. H. R. Hosseini^{1,2}, D. K. Kang¹, T. Sakugawa¹, H. Akiyama^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto City, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto City, Japan
- 3P-46 Fundamental Study to Apply the Pulsed Power Technology on the Biomass Fuel Production**
M. Yamanaka¹, A. Fujita¹, K. Teranishi², N. Shimomura²
¹Graduate School of Advanced Technology and Science, The University of Tokushima, Tokushima, Japan
²Institute of Technology and Science, The University of Tokushima, Tokushima, Japan
- 3P-47 Influences of Pulsed Electric Fields on the Gene Expression of Pathogenic Bacteria**
Y. Manabe, R. Nakagawa, S. Zehong, M. Maetani, K. Teranishi, N. Shimomura, A. Takahashi
The University of Tokushima, Tokushima, Japan
- 3P-48 Atmospheric Pulsed DBD Plasma Jet for Study on Bacterial Inactivation**
J. Li, N. Sakai, M. Watanab, E. Hotta
Dep. of Energy Sciences, Tokyo Institute of Technology, Yokohama, Japan
- 3P-49 In Vivo Experiment of Applying Nanosecond Pulsed Electric Fields on Solid Tumor**
Y. Magori, S. Ohta, T. Kageyama, K. Teranishi, N. Shimomura, Y. Uto, H. Horii
Engineering, The University of Tokushima, Tokushima, Japan
- 3P-50 Enhancement of Yeast Proliferation Using Pulsed Atmospheric Discharge Plasmas**
S. Takeuchi¹, D. Obata¹, T. Yamamoto¹, S. Katsuki^{1,2}, H. Akiyama^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto, Japan
- 3P-51 A Touchable Pulsed Air Plasma Plume Driven by DC Power Supply**
X. Lu, S. Wu, Y. Pan
HuaZhong University of Science & Technology, WuHan, China
- 3P-52 Study of Proliferation of Budding Yeast Subjected to Nanosecond Pulsed Electric Fields**
T. Yamano¹, K. Arikawa¹, S. Katsuki², H. Akiyama¹
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-53 Improvement of Polyphenol Extraction from Grape Skin by Pulse Electric Field**
K. Takaki, H. Hatayama, S. Koide, Y. Kawamura
Iwate University, Morioka, Iwate, Japan
- 3P-54 Improvement of Ozone Yield Using Double Loop Type Inductive Energy Storage Circuit**
I. Yagi¹, K. Takaki¹, T. Go², T. Namihira³
¹Iwate University, Morioka, Iwate, Japan
²Ichinoseki National College of Technology, Ichinoseki, Iwate, Japan
³Kumamoto University, Kumamoto, Japan
- 3P-55 Release of Mitochondrial Membrane Space Apoptosis-Related Proteins to Cytoplasm of SKOV3 Cells Induced by Nanosecond Pulsed Electric Fields Exposure in Vitro**
Y. Mi¹, C. Yao¹, C. Li¹, F. Guo¹, Y. Wen², J. Tang²
¹Laboratory of Power Transmission Equipment and System Security and New Technology, Chongqing University, Chongqing, China
²First Affiliated Hospital, Chongqing Medical Science University, Chongqing, China

- 3P-56** **Research on the Impact Features of a Thin-Walled Metal Tube Subjected to a Pulsed Magnetic Dynamic Load**
X. Ming, H. Zhengxiang, G. Xiaohui, W. Yezhong, J. Xin
ZNDY of Ministerial Key Laboratory, Nanjing University of Science and Technology, Nanjing, China
- 3P-57** **Study of Nonlinearity Effects in Simple Circuits under Pulsed Conditions**
A. T. Bowlen, R. D. Curry, S. R. Ashby, R. L. Druce
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
- 3P-58** **Spectroscopic Measurements of an Atmospheric Toroidal Air Plasma**
A. Lodes¹, M. E. Rudroff¹, R. D. Curry¹, M. Schmidt², A. J. Bauer², W. Brown²
¹Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States
²Applied Research Associates, Inc., Arlington, VA, United States
- 3P-59** **Vapor Deposition of Thermo-Sensitive Poly(N-Isopropylacrylamide) by Atmospheric Pressure Plasma**
X. L. Tang^{1,2,3}, Y. Chen¹, B. T. Chen¹, G. Qiu^{1,3}
¹Plasma and Surface Research Center, College of Science, Donghua University, Shanghai 201620, China
²National Engineering Research Centre for Dyeing and Finishing of Textiles, Shanghai 201620, China
³College of Material Science and Engineering, Donghua University, Shanghai 201620, China
- 3P-60** **The PHELIX Liner Demonstration Experiment (PLD-1)**
C. L. Rousculp¹, W. A. Reass¹, D. M. Oro¹, D. B. Holtkamp¹, B. J. Hollander¹, J. R. Griego¹, R. E. Reinovsky¹, T. E. Graves², D. O. Devore²
¹Los Alamos National Laboratory, Los Alamos, NM, United States
²National Security Technologies, Los Alamos, NM, United States
- 3P-61** **Achieving High Pressure Shock Hugoniot Measurements in Cylindrical Geometry Utilizing a High-Explosive Pulsed Power Drive**
J. H. Peterson¹, C. L. Rousculp¹, D. B. Holtkamp², D. M. Oro², J. R. Griego², W. L. Atchison¹, R. E. Reinovsky³
¹Applied Computational Physics, Los Alamos National Laboratory, Los Alamos, NM, United States
²Physics, Los Alamos National Laboratory, Los Alamos, NM, United States
³Theoretical Design, Los Alamos National Laboratory, Los Alamos, NM, United States
- 3P-62** **A New Magneto-Hydrodynamics Code Capability**
A. M. Kaul
XCP Division, Los Alamos National Laboratory, Los Alamos, NM, United States
- 3P-63** **Numerical Modelling of a Foil-Flyer Electromagnetic Accelerator**
B. M. Novac¹, I. R. Smith¹, K. Omar^{1,2}, N. Graneau², M. Sinclair²
¹Electronic and Electrical Engineering Department, Loughborough University, Loughborough, United Kingdom
²Hydrodynamics Division, AWE Aldermaston, Reading, United Kingdom
- 3P-64** **High Power Pulsed Laser Induced Breakdown Plasma at Gas-Solid Interface**
M. Thiyagarajan
Plasma Engineering & Research Lab (PERL), Texas A&M University - Corpus Christi, Corpus Christi, TX, United States
- 3P-65** **Ozone Generation Using Positive- and Negative- Nano-Seconds Pulsed Discharges**
N. Takamura¹, T. Matsumoto¹, D. Wang², T. Namihira³, H. Akiyama¹
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Priority Organization for Innovation and Excellence, Kumamoto University, Kumamoto, Japan
³Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 3P-66** **A Traditional Analytical Tool, Modernized**
A. J. Bauer

- 3P-67 The Decomposition of Humate Solution by Pulsed Discharge in the Bubble**
F. Fukawa¹, K. Rokkaku¹, Y. Sakai¹, Y. Yazawa¹, K. Teranishi², N. Shimomura², S. Suzuki¹,
H. Itoh¹
¹Chiba Institute of Technology, Chiba, Japan
²The University of Tokushima, Tokushima, Japan
- Poster Session 3P: Pulsed Power Systems II: Repetitive and Single Shot Systems**
- Wednesday, June 22 1:30-3:30, Regency Ballroom
- Session Chair: Allen Stults, Aviation and Missile Research Development and Engineering
Laboratory
- 3P-68 Status of Genesis a 5 MA Programmable Pulsed Power Driver**
S. F. Glover¹, L. X. Schneider¹, K. W. Reed¹, G. E. Pena¹, J. -P. Davis¹, C. A. Hall¹, R. J. Hickman¹,
K. C. Hodge², R. W. Lemke¹, J. M. Lehr¹, D. J. Lucero², D. H. McDaniel¹, J. G. Puissant²,
J. M. Rudys¹, M. E. Sceiford¹, S. J. Tullar², D. M. Van De Valde³, F. E. White², P. J. Foster⁴
¹Sandia National Laboratories, Albuquerque, NM, United States
²Ktech Corporation, Albuquerque, NM, United States
³EG&G, Albuquerque, NM, United States
⁴Defense Nuclear Facilities Safety Board, Washington, DC, United States
- 3P-69 Radiographic X-Ray Pulse Jitter**
C. V. Mitton¹, D. E. Good¹, D. J. Henderson¹, K. W. Hogge¹, I. Molina¹, D. S. Nelson²,
E. C. Ormond², S. R. Cordova³, J. R. Smith⁴
¹Dept AA-13, National Security Technologies (NSTec), Las Vegas, NV, United States
²Dept. Nevada Operations, Sandia National Laboratories, Mercury, NV, United States
³Dept. Albuquerque Operations, Sandia National Laboratories, Albuquerque, NM, United States
⁴Dept. Los Alamos Operations, Los Alamos National Laboratory, Los Alamos, NM, United States
- 3P-70 High Voltage Surge Arrestor Testing with Enhanced Transformer Drive**
R. J. Adler¹, D. V. Price¹, J. Evans², D. Wastell³
¹Applied Energetics, Tucson, AZ, United States
²AWE, Aldermaston, United Kingdom
³Equipment Support Company, Cambridgeshire, United Kingdom
- 3P-71 A Robust Modular IGBT Power Supply for Configurable Series/Parallel Operation at High
Power and Frequency**
T. Ziemba, K. Miller, J. Prager, J. Carscadden
Eagle Harbor Technologies, Inc., Seattle, WA, United States
- 3P-72 Solid-State Marx Type Modulator for Plasma Based Ion Implantation Applications**
L. M. S. Redondo^{1,2}, F. H. M. Cavalgante^{1,2}, H. Canacsinh^{1,2}, M. T. Pereira³, M. R. Gomes¹,
M. R. Silva¹
¹Nuclear Physics Center from Lisbon University, Lisbon, Portugal
²Lisbon Superior Engineering Institute, ISEL, Lisbon, Portugal
³Lusoforma, Sintra, Portugal
- 3P-73 Solid-State Marx Generator Controlled by FPGA with Integrated Oscilloscope and Graphical
User Interface**
F. G. Pereira^{1,2}, H. Canacsinh^{2,3}, J. P. Mendes^{2,3}, P. Tavares³, L. M. Redondo^{2,3}
¹Faculdade de Ciências e Tecnologia UNL, Almada, Portugal
²Lisbon Superior Engineering Institute, Lisbon, Portugal
³Nuclear Physics Center from Lisbon University, Lisbon, Portugal
- 3P-74 A Disk EMG System for Driving Impacting Liners to ~ 20 Km/s**
A. M. Buyko¹, S. F. Garanin¹, A. M. Glybin¹, Y. N. Gorbachev¹, P. V. Dudai¹, V. I. Dudin¹,
V. V. Zmushko¹, G. G. Ivanova¹, A. V. Ivanovsky¹, A. I. Kraev¹, I. V. Morozov¹, I. V. Morozova¹,
A. N. Skobelev¹, V. B. Yakubov¹, W. L. Atchison², R. E. Reinovsky², D. B. Holtkamp²
¹RFNC-VNIIEF, Sarov, NN, Russian Federation

²Los Alamos National Laboratory, Los Alamos, NM, United States

- 3P-75** **Development of a Boost Converter Topology for a High Repetition Pulsed Power Generator**
A. Nami, T. Sakamoto, M. Akiyama, H. Akiyama
Graduate School of Science and Technology (Global-COE), Kumamoto University, Kumamoto, Japan
- 3P-76** **A Repetitive Solid State Marx-Type Pulsed Power Generator Using Multi-Stage Switch-Capacitor Cells**
T. Sakamoto, A. Nami, M. Akiyama, H. Akiyama
Graduate School of Science and Technology (G-COE), Kumamoto University, Kumamoto, Japan
- 3P-77** **Design and Evaluation of a Water Blumlein Pulse Generator**
H. Heo, O. R. Choi, S. H. Nam
Pohang Accelerator Laboratory, Pohang, Kyungbuk, South Korea
- 3P-78** **Behavior of Spark Gaps in Self Breakdown Mode**
H. Rahaman, B. -J. Lee, J. W. Nam, S. H. Nam
Pohang Accelerator Laboratory, Postech, Pohang, Kyungbuk, South Korea
- 3P-79** **Repetitive 300 kV Pulse Generator with Blumlein Pulse Forming Line**
S. W. Lim¹, C. H. Cho², J. S. Kim², Y. B. Kim², H. J. Ryou², Y. S. Jin²
¹Dept. of Energy Conversion Technology, University of Science & Technology, Changwon, South Korea
²Industry Application Research Division, Korea Electrotechnology Research Institute, Changwon, South Korea
- 3P-80** **A Compact High Repetition-Rate Magnetic Pulse Compression Generator**
D. D. Zhang, Y. Zhou, J. Wang, T. Shao, P. Yan
Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing, China
- 3P-81** **500 kV Solid-State Marx Generator for High Power Applications**
H. Li, W. Xie, C. Wang, P. Jiang, Q. Tian, J. Liu, J. Yuan
Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China
- Poster Session 3P:** **Power Electronics**
- Wednesday, June 22 1:30-3:30, Regency Ballroom
- Session Chair: Michael Giesselmann, Texas Tech University
- 3P-82** **Design and Control of an Inductive Adder for CLIC Damping Rings**
J. Holma¹, M. M. J. Barnes¹, S. S. J. Ovaska²
¹CERN, Geneva, Switzerland
²School of Science and Technology, Aalto University, Espoo, Finland
- 3P-83** **An Isolated DC-DC Converter with High-Output-Voltage for a TWTA**
T. B. Lazzarin¹, C. C. Motta², I. Barbi¹
¹Federal University of Santa Catarina, Florianópolis, SC, Brazil
²University of Sao Paulo - USP, Sao Paulo, SP, Brazil
- 3P-84** **Gate-Drive for Solid-State Modulators with Improved Short Circuit Detection and Short Circuit Current Turn-off Capability**
D. Gerber, J. Biela
Dept. of Information Technology and Electrical Engineering, Laboratory for High Power Electronic Systems, Zurich, Switzerland
- 3P-85** **Improved Hybrid MOSFET/Driver Switching Module for Pulsed Power Applications**
T. Tang, C. Burkhart
Power Conversion Department, Stanford Linear Accelerator Center, Menlo Park, CA, United States

- 3P-86** **Development of Inexpensive Electrical Probe for Wideband Voltage Measurement Up To 300 kV**
H. Rahaman¹, H. Heo¹, Y. K. Son¹, O. R. Choi¹, S. H. Nam¹, J. H. So², C. H. Kuk³
¹Pohang Accelerator Laboratory, Pohang, Kyungbuk, South Korea
²ADD, Daejeon, Yuseong, South Korea
³LIG Nex 1, Yongin, Gyeonggi-do, South Korea
- 3P-87** **A Simple Method for Operating IGBTs in Series Connection**
W. Djuriatno
Electrical Engineering Dept., Universitas Brawijaya, Malang, Indonesia
- 3P-88** **A Compact 700-kV Erected Pulse Forming Network for HPM Applications**
C. Nunnally, M. B. Lara, J. R. Mayes, W. C. Nunnally, D. W. Kohlenberg
Applied Physical Electronics LLC, Austin, TX, United States
- 3P-89** **Power Supply with Bipolar Pulsed Output Voltage and High Repetition Rate Based on a Solid-State Marx Topology**
D. Tastekin¹, F. Blank¹, A. Lunk², J. Roth-Stielow¹
¹Dept. of Power Electronics and Electrical Drives (ILEA), University of Stuttgart, Stuttgart, Germany
²Department of Plasma Research (IPF), University of Stuttgart, Stuttgart, Germany
- 3P-90** **A Comparative Investigation of IGBT and MOSFET Devices for Fast Rising Time and High Repetition Rate Pulse Generation**
S. R. Jang¹, H. J. Ryoo², S. H. Ahn¹, S. B. Ok¹, G. Goussev², G. H. Rim²
¹Energy Conversion Technology, University of Science & Technology, Daejeon, South Korea
²Industry Research Division, Korea Electrotechnology Research Institute, Changwon, South Korea
- 3P-91** **Reconfigurable Compact Pulsed Power Modules**
J. R. Mayes
Applied Physical Electronics, L.C., Austin, TX, United States
- 3P-92** **Recent Upgrade of the Klystron Modulator at SLAC**
M. N. Nguyen, C. P. Burkhart, B. K. Lam, B. Morris
SLAC National Accelerator Laboratory, Menlo Park, CA, United States
- 3P-93** **120MW/370kV Solid State Modulator with Ultra-High Repetition Accuracy**
D. Gerber, J. Biela
Dept. of Information Technology and Electrical Engineering, Laboratory for High Power Electronic Systems, Zurich, Switzerland
- 3P-94** **An Assessment on Klystron Modulator Topologies for the ESS Project**
C. A. Martins¹, K. Rathsmann²
¹Dept. Electrical & Computers Engineering, GEL-GIF, University Laval, Quebec, Quebec, Canada
²Accelerators Dept., European Spallation Source, Lund, Sweden
- 3P-95** **All Solid-State Bipolar Pulse Voltage Adder with Simple Isolation Charge Circuit and FPGA Control**
D. Wang, L. Gao, L. Li, K. Liu
Department of Information Science and Technology, Fudan University, Shanghai, China
- 3P-96** **200-MW Klystron-Modulator for 3-GeV PLS-II Linac**
B. Park^{1,2}, D. S. Kim¹, S. S. Park³, S. H. Nam³, S. S. Park¹
¹R&D team, Dawonsys Co. Ltd., Siheung, South Korea
²Department of Physics, Postech, Pohang, South Korea
³Pohang Accelerator Laboratory, Postech, Pohang, South Korea
- 3P-97** **Compact Capacitor Charger Using Resonant MOSFET Inverter**
T. Sakugawa¹, Y. Matsumoto¹, Y. Itoh¹, H. Akiyama¹, K. Suematsu², A. Kouda², M. Watanabe², S. Baba²
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Suematsu Electronics Co. Ltd., Yatsushiro, Kumamoto, Japan

5:15 6B-7 Transient Performance of Battery/Fuel Cell-Based APU on Aircraft Electric Power Systems with Nonlinear Loading

H. El-Kishky, H. Ebrahimi

Electrical Engineering, The University of Texas at Tyler, Tyler, TX, United States

Session 6C: Pulsed Power Systems II: Electromagnetic Launch and Lasers

Wednesday, June 22 3:30-5:30, Conference Center 11A-B

Session Chairs: Jess Neri, Naval Research Laboratory
Frank Hegeler, Commonwealth Technologies, Inc.

3:30 6C-1 Modern Battery-Based Architectures for Applications in Lasers and Other Pulsed Power Systems

W. J. DeHope, W. J. Clark, G. F. James, G. B. McHale, B. T. Merritt, A. T. Rivera
Lawrence Livermore National Laboratory, Livermore, CA, United States

3:45 6C-2 The ARMY's Bounded Wave Horizontal EMP Simulator

R. Blundell

Department of Army, White Sands Missile Range, NM, United States

4:00 6C-3 Design and Implementation of an Advanced X-Ray Trigger Generator for EML Test Facilities

B. M. Huhman¹, J. M. Neri¹, T. R. Lockner²

¹Plasma Physics Division, US Naval Research Laboratory, Washington, DC, United States

²Global Strategies Group, Crofton, MD, United States

4:15 6C-4 (INVITED) A 40-Stage DES Plasma Arc Railgun

R. W. Karhi¹, D. A. Wetz², J. J. Mankowski¹, M. Giesselmann¹, I. K. El-Dana¹

¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

²Electrical Engineering Department, University of Texas at Arlington, Arlington, TX, United States

4:45 6C-5 Simulation and Measurement on Velocity of Flat-Plate Projectiles in a Three-Stage Reconnection Electromagnetic Launcher

X. Duan, M. Liao, J. Zou, C. Zhao, Z. Zhou

School of Electrical Engineering, Dalian University of Technology, Dalian, China

5:00 6C-6 Simulation and Experiment of a Series Augmented Electromagnetic Rail Launcher

Z. Wang

School of Science and Technology, Yanshan University, Qinhuangdao City, China

5:15 6C-7 Developmental Studies on a 1m Long Rail Gun and the Associated 20kJ Pulsed Power System

J. T. M., S. U.

Electrical Engineering, Indian Institute of Science, Bangalore, Karnataka, India

THURSDAY, JUNE 23

Session PL4: Haas Award Winner

Roger White, L-3 Communications, Pulse Sciences

“From Coalminer’s Grandson to Peter Haas Award”

Thursday, June 23 8:00-8:50, Conference Center 12A-D

Session 7A: Pulsed Power Systems III: Repetitive and Single Shot Systems

Thursday, June 23 9:30-12:00, Conference Center 10A-B

Session Chair: Richard Ness, Ness Engineering Inc.

- 9:30** **7A-1 (INVITED) Impact of Time Varying Loads on the Programmable Pulsed Power Driver Called Genesis**
S. F. Glover¹, L. X. Schneider¹, K. W. Reed¹, G. E. Pena¹, J. -P. Davis¹, C. A. Hall¹,
H. L. Hanshaw¹, R. J. Hickman¹, K. C. Hodge², R. W. Lemke¹, J. M. Lehr¹, D. J. Lucero²,
D. H. McDaniel¹, J. G. Puissant², J. M. Rudys¹, M. E. Sceiford¹, S. J. Tullar², D. M. Van De Valde³,
F. E. White², L. K. Warne¹, R. S. Coats¹, R. E. Jorgenson¹, W. A. Johnson¹
¹Sandia National Laboratories, Albuquerque, NM, United States
²Ktech Corporation, Albuquerque, NM, United States
³EG&G, Albuquerque, NM, United States
- 10:00** **7A-2 Isentropic Compression Studies at the Los Alamos National High Magnetic Field Laboratory**
D. G. Tasker¹, C. H. Mielke², G. Rodriguez³, D. G. Rickel²
¹WX-6, Los Alamos National Laboratory, Los Alamos, NM, United States
²MPA-CMMS, Los Alamos National Laboratory, Los Alamos, NM, United States
³MPA-CINT, Los Alamos National Laboratory, Los Alamos, NM, United States
- 10:15** **7A-3 Cygnus Dosimetry**
J. R. Smith¹, D. S. Nelson², E. C. Ormond², S. R. Cordova², I. Molina³, D. E. Good⁴, M. D. Hansen⁴,
D. J. Henderson⁴, K. W. Hogge⁴, C. V. Mitton⁴
¹Los Alamos National Laboratory, Los Alamos, NM, United States
²Sandia National Laboratories, Mercury, NV, United States
³Great Basin Technology, Inc., Albuquerque, NM, United States
⁴National Security Technologies, North Las Vegas, NV, United States
- 10:30** **7A-4 Transformer-Based, Repetitive Pulsed Power Driver for a Dense Plasma Focus**
C. James¹, B. Bures¹, R. E. Madden¹, M. Krishnan¹, R. Adler²
¹Alameda Applied Sciences Corporation, San Leandro, CA, United States
²Northstar High Voltage Corporation, Albuquerque, NM, United States
- 10:45** **7A-5 Development of Modulator Pulse Stability Measurement Device and Test Results at SLAC**
C. Huang, C. Burkhart, M. Kemp, B. Morris, T. Beukers, M. Nguyen, R. Ciprian
SLAC National Accelerator Laboratory, Menlo Park, CA, United States
- 11:00** **7A-6 SiC Super GTO Technology Development: Present Status and Future Perspective**
J. Q. Zhang¹, A. Agarwal¹, C. Capell¹, M. O'Loughlin¹, A. Burk¹, J. Sumakeris¹, J. Palmour¹,
V. Temple², A. Ogunniyi³, H. O'Brien³, C. Scozzie³
¹Power R&D, Cree, Inc., Durham, NC, United States
²Silicon Power Corporation, Clifton Park, NY, United States
³Army Research Laboratory, Adelphi, MD, United States
- 11:15** **7A-7 Capacitor Bank for ITER Fast Discharge Unit**
B. E. Fridman, R. S. Enikeev, K. S. Harcheva, N. A. Kovrizhnykh, A. G. Roshal, R. A. Serebrov
STC, D.V. Efremov Scientific Research Institute of Electrophysical Apparatus, St. Petersburg,
Russian Federation
- 11:30** **7A-8 Semiconductor Switches in a Counter-Pulse Capacitor Bank**
R. S. Enikeev, B. E. Fridman, R. A. Serebrov
STC, D.V. Efremov Scientific Research Institute of Electrophysical Apparatus, St. Petersburg,
Russian Federation
- 11:45** **7A-9 Experimental Study of Repetitive LTDs Based on Solid-State Switches**
H. Liu, C. Wang, H. Li, J. Yuan, J. Liu, W. Xie
Institute of Fluid Physics, CAEP, Mianyang, China

Session 7B: Applications III: Medical, Biological, and Environmental Applications

Thursday, June 23 9:30-12:00, Conference Center 10C-D

Session Chair: Ravi Joshi, Old Dominion University

- 9:30** **7B-1 Single Nanosecond Pulsed Power Induced Structural Modifications of Medaka Fish Embryo**
D. K. Kang¹, S. H. R. Hosseini^{1,2}, E. Shiraiishi¹, M. Yamanaka¹, H. Akiyama^{1,2}
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
- 9:45** **7B-2 Permeabilisation Obtained by Microsecond and Nanosecond Electric Pulses: Experimental Proofs of the Relevant Parameters**
A. Silve¹, R. Vezinet², L. M. Mir¹
¹CNRS UMR 8203, Villejuif, France
²CEA,DAM, Gramat, France
- 10:00** **7B-3 Study of Reflector Antennas for Focusing Subnanosecond Electric Pulses in Biological Tissues**
C. Bajracharya^{1,2}, S. Xiao^{1,2}, K. H. Schoenbach^{1,2}
¹Department of Electrical and Computer Engineering, Old Dominion University, Norfolk, VA, United States
²Frank Reidy Research Center for Bioelectrics, Old Dominion University, Norfolk, VA, United States
- 10:15** **7B-4 Response of HeLa Cells to Transient Thermal Shock**
K. Mitsutake¹, S. Moriyama¹, K. Abe¹, S. Katsuki^{1,2}, H. Akiyama^{1,2}, T. Shuto³, H. Kai³
¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Bioelectrics Research Center, Kumamoto University, Kumamoto, Japan
³Graduate School of Pharmaceutical Sciences, Kumamoto University, Kumamoto, Japan
- 10:30** **7B-5 Modification of Dielectric Characteristics of Cells by Intense Pulsed Electric Field**
J. Zhuang, K. H. Schoenbach, J. F. Kolb
Frank Reidy Research Center for Bioelectrics, Old Dominion University, Norfolk, VA, United States
- 10:45** **7B-6 Analysis of Subnanosecond High-Intensity, Electrical Pulsing of Biological Cells**
Q. Hu¹, R. P. Joshi²
¹School of Engineering and Technology, Central Michigan University, Mt. Pleasant, MI, United States
²Electrical and Computer Engineering, Old Dominion University, Norfolk, VA, United States
- 11:00** **7B-7 Influence of Gas Flow Rate and Pressure in Reactor on Ozone Production Using a Compact Pulsed Power Generator**
F. Tanaka, T. Iwaishi, T. Sakugawa, H. Akiyama
Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
- 11:15** **7B-8 Response of Blood Sugar in Cells to Electromagnetic Radiation Exposure Using Gtem Cells**
N. Boriraksantikul¹, S. Tantong¹, P. Kirawanich², J. Viator³, N. Islam¹
¹Department of Electrical and Computer Engineering, University of Missouri-Columbia, Columbia, MO, United States
²Department of Electrical Engineering, Mahidol University, Salaya, Nakhon Pathom, Thailand
³Department of Biological Engineering, University of Missouri-Columbia, Columbia, MO, United States
- 11:30** **7B-9 Pulsed High-Voltage Generator for Atmospheric Discharge**
W. Jiang¹, A. Tokuchi^{1,2}
¹Department of Electrical Engineering, Nagaoka University of Technology, Nagaoka, Japan
²Pulsed Power Japan Laboratory Ltd., Kusatsu, Japan
- 11:45** **7B-10 A Comparison Of The Efficacy Of Pulsed UV Light And Pulsed Plasma Gas-Discharge Systems For The Novel Inactivation Of Cryptosporidium Spp. And Other Clinically Relevant Microorganisms In Drinking Water**
J. C. Hayes¹, A. M. Fogarty², N. J. Rowan¹
¹Dept. of Nursing and Health Science, Athlone Institute of Technology, Co. Westmeath, Ireland
²Dept. of Life and Physical Science, Athlone Institute of Technology, Co. Westmeath, Ireland

Session 7C: Power Electronics II: Modulators and Power Supplies

Thursday, June 23 9:30-12:00, Conference Center 11A-B

Session Chair: Bucur Novac, Loughborough University

- 9:30 7C-1 (INVITED) A Solid State Marx Modulator with Dynamic Adjustable Output Voltage**
R. L. Cassel
Stangenes Industries Inc., Palo Alto, CA, United States
- 10:00 7C-2 "HiVoMoPS"-Klystron Modulator for Pulsed and Cw-Operation Applications**
M. Hohmann
Transtechnik GmbH & Co.KG, Munich/Holzkirchen, Germany
- 10:15 7C-3 (INVITED) Final Design of the SLAC P2 Marx Klystron Modulator**
M. A. Kemp, A. Benwell, C. Burkhart, R. Larsen, K. Macken, D. MacNair, M. Nguyen, J. Olsen
SLAC National Accelerator Laboratory, Menlo Park, CA, United States
- 10:45 7C-4 Rep-Rated Operation of a Modular Compact HV-Capacitor Charger**
T. T. Vollmer, M. G. Giesselmann
Electrical & Computer Engineering, Texas Tech University, Lubbock, TX, United States
- 11:00 7C-5 MOS-FET Based Marx Generator for Application to Electron Guns**
A. Tokuchi^{1,2}, W. Jiang²
¹Pulsed Power Japan Laboratory Ltd., Kustsu, Shiga, Japan
²Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Niigata, Japan
- 11:15 7C-6 Pulse to Pulse Stability at Parts per Million (ppm) Level**
M. Lindholm, W. Crewson, K. Elmquist
ScandiNova Systems AB, Uppsala, Sweden
- 11:30 7C-7 High Power Pulse Quality Using Solid State Technology**
M. Lindholm, W. Crewson, K. Elmquist
ScandiNova Systems AB, Uppsala, Sweden
- 11:45 7C-8 A Solid State Modulator for the Portable C Band Accelerator System**
K. Gan, H. Hu, T. Li, H. Zhang
Institutes of the Applied Electronics, China Academy of Engineering Physic, Mianyang, China