### 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
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 |
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. Yuan, W. Xie, H. Li, H. Liu, J. Liu, X. Wang, W. Jiang  
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. Merensky, A. F. Kardo-Sysoev, D. Shmilovitz, Y. Sharabani, I. Shafir, A. Sher, A. S. Kesar  
1Soreq NRC, Yavne, Israel  
2Ioffe PTI, St. Petersburg, Russia  
3Tel Aviv University, Tel Aviv, Israel |
1Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan  
2Suematsu Electronics Co. Ltd., Yatsushiro, Kumamoto, Japan |
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 1B: Microwaves I: Microwave and RF Sources and Antennae

Monday, June 20 9:30-12:00, Conference Center 10C-D

Session Chair: Don Shiffler, Air Force Research Laboratory

9:30 1B-1 (INVITED) Non-Resonant Parametric Amplification and Higher Harmonic Generation of High Power Microwave Signals in Nonlinear Transmission Lines
A. B. Kozyrev
Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI, United States

10:00 1B-2 Pspice Simulations of Nonlinear Transmission Lines Based on Ferroelectric Dielectrics
P. Norgard, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

10:15 1B-3 Pulsed High Power RF Generation from Nonlinear Dielectric Ladder Networks - Performance Limits
P. W. Smith
Pembroke College, Oxford University, Oxford, United Kingdom

10:30 1B-4 Characterization of a Synchronous Wave Non Linear Transmission Line
P. D. Coleman, J. J. Borchardt, J. A. Alexander, J. T. Williams, T. Peters
Dept. 5443, Sandia National Laboratories, Albuquerque, NM, United States

10:45 1B-5 A Novel Solid-State HPM Source Based on a Gyromagnetic NLTL and SOS-Based Pulse Generator
S. J. F. Chadwick¹, N. Seddon¹, S. Rukin²
¹MBDA ltd., Bristol, United Kingdom
²Institute of Electrophysics, Russian Academy of Sciences, Ekaterinburg, Russia

11:00 1B-6 Temperature Dependence of Ferrimagnetic Based Nonlinear Transmission Line
J. W. B. Bragg, J. Dickens, A. Neuber
Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States

11:15 1B-7 Development of High Power Gyromagnetic Nonlinear Transmission Lines
I. V. Romanchenko, V. V. Rostov, A. I. Klimov, I. K. Kurkan, A. V. Gunin
Institute of High Current Electronics SB RAS, Tomsk, Russian Federation

11:30 1B-8 Circuit Modeling of Nonlinear Lumped Element Transmission Lines
N. S. Kuek¹, A. C. Liew¹, E. Schamiloglu², J. Rossi³
¹Department of Electrical & Computer Engineering, National University of Singapore, Singapore, Singapore
²Department of Electrical & Computer Engineering, University of New Mexico, Albuquerque, United States
³Associated Plasma Laboratory, INPE, Sao Jose dos Campos, Brazil

11:45 1B-9 Experimental Demonstration of Nonlinear Lumped Element Transmission Lines Using COTS Components
N. S. Kuek¹, A. C. Liew¹, E. Schamiloglu²
¹Department of Electrical & Computer Engineering, National University of Singapore, Singapore, Singapore
²Department of Electrical & Computer Engineering, University of New Mexico, Albuquerque, United States

Session 1C: Components I: Insulation and Dielectric Breakdown

Monday, June 20 9:30-12:00, Conference Center 11A-B
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 Arrester Connector (LAC) Devices
H. P. Hjalmarson1, 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
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
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
1P-2 Design of Compact Feed Through for 500 kV High Voltage Cable
L. Veron, R. Rosol, J.-C. Brion
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 <5µs 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. Pokrvailo, 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. Jadidian, J. G. Hwang, M. Zahn, L. A. A. Pettersson
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. Given, M. P. Wilson, I. V. Timoshkin, T. Wang, S. J. MacGregor, J. M. Lehr
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
1P-14  Numerical Generation of the Random Variable Impulse Breakdown Voltage of Gases  
E. Dolicanin¹, K. Stankovic¹, R. Marie², B. Iricanin¹, G. Ilic², R. Radosavljevic³  
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  
Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan

1P-16  Study on Contact Resistance of Electric Circuit Model for Electromagnetic Railgun  
P. Liu¹,²  
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. Karlik³, G. E. Ozur³, 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. Qiu¹, 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  
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  
3Bioelecrics 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 Galloudec1,2, 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. Banakh1, B. M. Novac1, I. R. Smith1, L. Pecastaing2, R. Ruscasie1, 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. Nelson1, E. C. Ormond2, S. R. Cordova2, J. R. Smith1, T. J. Haines2, W. M. Wood2  
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  
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
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

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

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

Multipacting Simulations in a Coaxial Transmission Line with VORPAL
C. M. Roark, C. Nieter, P. H. Stoltz
Tech-X Corporation, Boulder, CO, United States

Electric Field Distributions in High Power Microwaves Confined by Plasma Column
S. S. M. Chung
Electronics Engineering, Southern Taiwan University of Technology, Tainan, Taiwan

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

A Multiple Burst, Variable Frequency, High Power Driver for Antenna Characterization
K. A. OConnor, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

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

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

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

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

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
1P-49  
**Simulated Parameters of Subgigawatt Relativistic BWOs with Permanent Magnetic Systems**  
V. V. Rostov¹, A. V. Gunin¹, E. M. Troimenov¹, K. A. Sharypov⁵, 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  
⁴ITIPP 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**  
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. Umenyiora¹, R. L. Druce¹, R. D. Curry¹, J. J. Bowders²  
¹Dept. of Electrical & Computer 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**
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. Canacsinh², L. M. Redondo³
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. Intrator³, 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(Zr0.52Ti0.48)O3 Ceramics
S. I. Shkuratov¹, E. F. Talantsev², J. Baird³
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. Domonkos¹, S. Heidger¹, D. Brown², A. Devoe³, F. Dogan⁴, D. Gale², J. O'Loughlin¹,
J. Parker³, D. Sandoval², K. Slenes³, W. Sommers¹, 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. Tokuchi¹²
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. Baksh, 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. Senior³, G. Louverdis³
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. Pecquouis¹, L. Pecastuing¹, M. Rivaletto¹, A. Silvestre de Ferron¹, P. Pignolet¹, L. Caramelle², J. -
M. Duband², R. Vezinet³
¹SIAME - UPPA, Pau, France
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

Reducing PFN Marx Generator Size Using Nested Solid Insulation  
R. J. Adler, J. A. Gilbrech, D. New  
Applied Energetics, Tucson, AZ, United States

Electrical Analysis of Piezoelectric Transformers and Associated High-Voltage Output Circuits  
Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States

Solid State Impulse Marx Generator  
J. R. Mayes, W. C. Nunnally, W. J. Carey  
Applied Physical Electronics, LC, Austin, TX, United States

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

Development of a High Repetition Rate and High Voltage Switching Power Supply with a SiC-JFET for an Induction Synchrotron  
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

Comparison of Computations and Experiments for Tests of Ranchero Flux Compression Generators Above 50 MA  
Los Alamos National Laboratory, Los Alamos, NM, United States

Mini-G: the Development of an Optimized FCG Device  
D. B. Reisman  
Lawrence Livermore National Laboratory, Livermore, CA, United States

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

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. Chase, S. Ault, D. Reisman  
1Care'n Co., Tracy, CA, United States  
2Hyperspectral Sciences, Inc., Cinebar, WA, United States  
3Lawrence Livermore Laboratories, Livermore, CA, United States

Possible Mechanisms of Electric Field-Free Gas Breakdown  
S. I. Shkuratov, J. Baird, E. F. Talantsev, L. L. Altgilbers  
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
1P-93 Fabrication Process for Producing the Dual Cavity Liner-Glide Plane Assembly Used on the MS-2 (Ranchero) High Explosive Pulse Power Experiment Fired at Los Alamos National Laboratory on 2-18-2010
R. B. Randolph
MST-7 / Materials Science and Technology, Los Alamos National Laboratory, Los Alamos, NM, United States

1P-94 Analysis of the Impact of Mutual Inductance on the MFCG Primary Pulse Current Magnification
C. Yu
Beijing Institute of Special Electromechanical Technology, Beijing, China

1P-95 Peculiarities of Formation of a Conical Piston at the Helical-Conical EMG Input
B. T. Egorychev, P. V. Duday, A. V. Ivanovsky, V. B. Kudelkin, N. I. Sitnikova, A. N. Skobelev
RFNC-VNIIEF, Sarov, Nizhny Novgorod Region, Russian Federation

1P-96 Power Pulser for Generation of a Series of High Voltage Pulses Based on Multi-Winding Machine
K. Gorbachev, E. Nesterov, V. Stroganov, E. Chernykh
Joint Institute for High Temperatures of RAS (JIHT RAS), Moscow, Russian Federation

1P-97 Study of a Possibility to Get Spherical Symmetry of a Quasi-Spherical Liner Implosion Under the Effect of Axial Magnetic Field
B. T. Egorychev, P. V. Duday, A. V. Ivanovsky, A. I. Kraev, V. B. Kudelkin, A. N. Skobelev
RFNC-VNIIEF, Sarov, Nizhny Novgorod Region, Russian Federation

1P-98 The Effects of Stator Insulation Material and Methods of Fabrication on the Performance of Compact Helical Flux Compression Generators
C. S. Anderson, A. A. Neuber, M. A. Elsayed, A. J. Young
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

1P-99 Explosive Current Opening Switch with Variable Topology of Current Path
I. V. Morozov, V. I. Dudin
RFNC-VNIIEF, Sarov, Russian Federation

1P-100 Compact Electro-Explosive Fuse Optimization for a Helical Flux Compression Generator
J. C. Stephens, A. A. Neuber, J. C. Dickens, M. Kristiansen
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

1P-101 A Novel Type of MFCG with Mutual Inductance Coils
C. Yu
Beijing Institute of Special Electromechanical Technology, Beijing, China

1P-102 Newton & Einstein and Others for Pulsed Power Inside Hydrogen's Atom
N. T. Elfikky
Extra High Voltage Div., Saudi Electricity Company-Central Region Branch, Riyadh 11411, Saudi Arabia

Session 2A: Explosive and Compact Pulsed Power II
Monday, June 20 3:30-5:30, Conference Center 10A-B
Session Chair: Gerald Kiuttu, VariTech Services

3:30 2A-1 (INVITED) Design Considerations for Flux-Trapping Helical-Flux Compression Generators Energized by Capacitive Discharge
A. Young, A. Neuber, M. Kristiansen
Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States

4:00 2A-2 COMSED 2 - Recent Advances to an Explosively Driven High Power Microwave Pulsed Power System
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(Zr0.95Ti0.05)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. Stults¹, J. Sweitzer²
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
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. Struve\textsuperscript{1}, J. W. Argo\textsuperscript{2}, R. D. Bengtson\textsuperscript{3}, D. I. Headley\textsuperscript{1}, J. W. Kellogg\textsuperscript{1}, S. M. Lewis\textsuperscript{3}, H. J. Quevedo\textsuperscript{1}, M. E. Savage\textsuperscript{1}, B. S. Stoltzfus\textsuperscript{1}, C. J. Waugh\textsuperscript{1}, M. Wisher\textsuperscript{1}
\textsuperscript{1}Pulsed Power Sciences Center, Sandia National Laboratories, Albuquerque, NM, United States
\textsuperscript{2}Ktech Corporation, Albuquerque, NM, United States
\textsuperscript{3}Dept. of Physics, University of Texas, Austin, TX, United States

3:45 2C-2 A Linear-Transformer-Driver (ltld) with Multiple Self-Triggered Switches
A. J. M. Pemen\textsuperscript{1}, Z. Liu\textsuperscript{2}, E. J. M. van Heesch\textsuperscript{1}
\textsuperscript{1}Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands
\textsuperscript{2}Zhejiang 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. Parker\textsuperscript{1}, B. M. Novac\textsuperscript{1}, I. R. Smith\textsuperscript{1}, P. Senior\textsuperscript{1}, G. Louverdis\textsuperscript{1}
\textsuperscript{1}Electronic and Electrical Engineering, Loughborough University, Loughborough, United Kingdom
\textsuperscript{2}Security 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\textsuperscript{1,2}, H. Canacsinh\textsuperscript{1,2}, L. M. Redondo\textsuperscript{1,2}, J. O. Rossi\textsuperscript{3}
\textsuperscript{1}Nuclear Physics Center from University of Lisbon, Lisbon, Portugal
\textsuperscript{2}Lisbon Engineering Superior Institute, Lisbon, Portugal
\textsuperscript{3}Instituto Nacional de Pesquisas Espaciais, São Paulo, Portugal

4:45 2C-6 Optimizing Repetitive Bipolar Solid-State Marx Generators
H. Canacsinh\textsuperscript{1,2}, L. M. Redondo\textsuperscript{1,2}, J. F. Silva\textsuperscript{1,4}
\textsuperscript{1}Instituto Superior de Engenharia de Lisboa, Lisbon, Portugal
\textsuperscript{2}Nuclear Physics Center from Lisbon University, Lisbon, Portugal
\textsuperscript{3}Instituto Superior Técnico, TU Lisbon, Lisbon, Portugal
\textsuperscript{4}Center 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\textsuperscript{1,2}, H. Canacsinh\textsuperscript{1,2}, M. R. Gomes\textsuperscript{1}
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

2C-9  Inductive Adder Based Method for Generating Electromagnetic Pulse with Controllable Timing  
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. Gottel¹, C. Gusbeth¹, A. Heinzel¹, 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,  
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

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. Caron³, 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. Bayol¹, F. Cubaynes², R. Delplanque²,  
J. Leckbee³, B. Oliver³  
¹CEA, DAM, DIF, Arpajon, France  
²ITHPP, Thégra, 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
10:30  3A-5 Experiments with the 2-Meter-Diameter, 810-KA LTD-III Accelerator Cavity
1671, 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. Lassalle, A. Loyen, A. Georges
CEA 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
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
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
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. Rostov, A. A. Elchaninov, A. I. Klimov, I. V. Romanchenko, G. A. Mesyats
M. I. Yalandin
1SB RAS, High Current Electronics Institute, Tomsk, Russia
2RAS, Lebedev Physical Institute, Moscow, Russia
3UB RAS, Institute of Electrophysics, Ekaterinburg, Russia
### Session 3B:

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| 10:15 | **Design of a Dual Cavity Reltron**                                  | S. Soh\(^1\), E. Schamiloglu\(^1\), R. B. Miller\(^2\)                  | 1\(^{st}\) Department of Electrical & Computer Engineering, University of New Mexico, Albuquerque, NM, United States  
2\(^{nd}\) Ktech Corporation, Albuquerque, NM, United States |
| 10:30 | **An "Energy Efficient" Vircator-Based HPM System**                   | J. Walter, J. Dickens, M. Krishiansen                                    | Texas Tech University, Center for Pulsed Power and Power Electronics, Lubbock, TX, United States |
| 10:45 | **A High Voltage Pulsed Power System for Repetitive Vircator Testing**| P. Norgard, K. R. Clements, R. D. Curry                                  | Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States |
| 11:00 | **3-D PIC Simulation of Virtual Cathode Oscillator**                 | W. Jiang, K. Ito                                                         | Department of Electrical Engineering, Nagaoka University of Technology, Nagaoka, Japan |
| 11:30 | **High Power SiC Solid State RF-Modules**                            | R. Irsigler\(^1\), R. Baumgartner\(^2\), M. Hergt\(^1\), T. Hughes\(^1\), O. Heid\(^1\) | 1\(^{st}\) CT T P-HTC, Siemens AG, Erlangen, Germany  
2\(^{nd}\) CT T DE HW1, Siemens AG, Munich, Germany |
| 11:45 | **Energy Efficiency of High Power Microwave Systems**                | J. T. Krile, M. Krishiansen                                              | Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, United States |

### Session 3C:

#### Components II: High Energy Density Storage, Transmission Lines, and Diagnostics

- **Session Chair:** Bruce Freeman, Ktech Corporation
- **Tuesday, June 21:** 9:30-12:00, Conference Center 11A-B

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| 9:30  | **High Voltage, Repetitive Pulsed Charge Discharge Testing of Prototype Capacitors** | S. L. Heidger\(^1\), F. Dogan\(^1\), A. Devoe\(^1\), D. Brown\(^2\), M. Domonkos\(^1\) | 1\(^{st}\) AFRL/RDHP, Air Force Research Laboratory, Kirtland AFB, NM, United States  
2\(^{nd}\) Material Science & Engineering, Missouri Institute of Science & Technology, Rolla, MO, United States  
3\(^{rd}\) Presidio Components, Inc., San Diego, CA, United States  
4\(^{th}\) SAIC, Albuquerque, NM, United States |
| 9:45  | **Test for End Connection Integrity of Metalized Film Capacitors**    | S. Qin\(^1\), X. Qi\(^1\), T. R. Jow\(^1\), S. Boggs\(^1\)               | 1\(^{st}\) Institute of Materials Science, University of Connecticut, Storrs, CT, United States  
2\(^{nd}\) GE Global Research, Niskayuna, NY, United States  
3\(^{rd}\) Army Research Laboratory, Adelphi, MD, United States |
| 10:00 | **Effects of Nd Doped BaTiO3 Nanoparticles on the Dielectric Properties of Nd-BaTiO3/PVDF Composites** | M. F. Lin\(^1\), J. Z. Lim\(^1\), P. S. Lee\(^1,2\) | 1\(^{st}\) Department of Material Science and Engineering, Nanyang Technological University, Singapore, Singapore  
2\(^{nd}\) Temasek Laboratories, Research Techno Plaza, Nanyang Technological University, Singapore, Singapore |
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. Lutz², 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. Rose³, 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

10:45  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 Polytechnic 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

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. Khododnaya¹, 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
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. Evis¹, V. Filippov², V. Ivanov¹, V. Miroshnichenko², A. Perunov², U. Priseko², V. Sidorov¹
¹All-Russian Electrotechnical Institute (VEI), Moscow, Russian Federation
²VNIITC 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. Osawa¹, 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

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. Wei¹, 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**
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**
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. Ogunnivi³, H. K. O’Brien¹, C. Scozzie¹, W. Shaheen², J. Zhang³, A. Agarwal³, V. Temple⁴
³US 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. Sanders³, S. C. Glidden², D. M. Warnow³
³Solid 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. Delmote³, 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. Mendonça¹, 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. Liu\(^1\), F. Sun\(^2\), H. Wei\(^2\), Q. Qiu\(^1\), Q. Zhang\(^2\)  
\(^1\)Electrical Engineering, Xi'an Jiaotong University, Xi'an, China  
\(^2\)Pulsed 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. Commissio, S. B. Swaneckamp, 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. Loyen, T. Chanconie  
CEA Gramat, 46500 Gramat, France

2P-44 **Investigation of High Current Submicrosecond LTD Stages at CEA Gramat**  
A. Loyen\(^1\), F. Lassalle\(^1\), B. Roques\(^1\), F. Bayol\(^2\), A. A. Kim\(^3\), B. M. Kovalchuk\(^3\)  
\(^1\)CEA Gramat, 46500 Gramat, France  
\(^2\)ITHPP, 46500 Thegra, France  
\(^3\)Institute of High Current Electronics, 634055 Tomsk, Russia

2P-45 **A Compact 2MA LTD for High Energy Density Physics Research**  
S. N. Bland\(^1\), R. B. Spielman\(^2\), S. V. Lebedev\(^3\), J. Skidmore\(^1\), G. Burdiak\(^1\), J. P. Chittenden\(^1\), P. Cong\(^3\)  
\(^1\)Imperial College London, London, United Kingdom  
\(^2\)Ktech Corporation, Albuquerque, NM, United States  
\(^3\)Northwest Institute of Nuclear Technology in China, Xi'an, China

2P-46 **Temporally Shaped Current Pulses on a Two-Cavity LTD System**  
M. E. Savage\(^1\), M. G. Mazarakis\(^1\), K. R. LeChien\(^2\), W. A. Stygar\(^1\), D. V. Rose\(^3\), C. L. Miller\(^3\), E. A. Madrid\(^4\), W. E. Fowler\(^5\)  
\(^1\)Sandia National Laboratories, Albuquerque, NM, United States  
\(^2\)NNSA, Washington, DC, United States  
\(^3\)Voss Scientific, Albuquerque, NM, United States  
\(^4\)Naval Research Laboratory, Washington, DC, United States  
\(^5\)Naval Research Laboratory, Washington, DC, United States

2P-47 **Circuit Model Development to Improve the Predictability of Shaped Current Pulses on Z**  
P. A. Corcoran\(^1\), J. P. Davis\(^1\), M. Savage\(^2\), B. Whitney\(^1\), I. Smith\(^1\), D. Hinshelwood\(^1\), B. Stoltzfus\(^2\), H. Hanshaw\(^2\), R. Lemke\(^2\), K. Struve\(^2\), V. Bailey\(^1\), E. Neau\(^1\), T. Wagoner\(^2\), C. Jennings\(^2\), W. Stygar\(^2\)  
\(^1\)L-3 Communications/Pulse Sciences, San Leandro, CA, United States  
\(^2\)Sandia National Laboratory, Albuquerque, NM, United States  
\(^3\)Naval Research Laboratory, Washington, DC, United States

2P-48 **A Novel High Performance Thyratron 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. Verma, A. Shyam, T. Patel, Y. C. Saxena  
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  
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  
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  
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
2P-62 **Plasma Lens for Transformation of Ion Beams**  
V. D. Bochkov, A. A. Drozdovskii, A. A. Golubev, D. D. Iosseliani, Y. B. Novozhilov, S. M. Savin, V. V. Yanenko  
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. Paraliev, S. Tsujino, C. Gough, E. Kirk, S. Ivkovic  
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**  
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. Morales, B. Hilko
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. Kim\(^1\), M. G. Mazarakis\(^2\), V. A. Sinebryukhov\(^1\), V. M. Alexeenko\(^1\), S. S. Kondratiev\(^1\), W. A. Stygar\(^2\)
\(^1\)Institute of High Current Electronics, Tomsk, Russian Federation
\(^2\)Sandia National Laboratories, Albuquerque, NM, United States

2P-75  **10 Ohm High Voltage Subnanosecond Pulse Generation**
S. El Amari, D. Arnaud-Cormos, P. Leveque, V. Coudere
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. Bochkov\(^1\), V. G. Ushich\(^1\), A. E. Dubiniv\(^2\), I. Y. Kornilova\(^2\), I. L. ‘vod\(^2\), S. A. Sadovoy\(^2\), V. D. Selemir\(^2\), D. V. Vyalykh\(^2\), V. S. Zhdanov\(^2\)
\(^1\)Pulsed Technologies Ltd., Ryazan, Russian Federation
\(^2\)Russian Federal Nuclear Center - All-Russian Research Institute for Experimental Physics, Sarov, Russian Federation

2P-77  **High-Current Pulse Generator for Plasma Focus**
A. V. Nashilevskiy\(^1\), V. P. Vinogradov\(^2\), G. G. Kanaev\(^1\), V. I. Krauz\(^2\), G. G. Remnev\(^1\)
\(^1\)National Research Tomsk Polytechnic University, Tomsk, Russian Federation
\(^2\)Russian Research Center "Kurchatov Institute", Moscow, Russian Federation

2P-78  **Pulsed Power Generator Driven by FPGA and PC**
M. Akiyama\(^1\), T. Goh\(^1\), M. Suemitsu\(^2\), T. Sakamoto\(^2\), H. Akiyama\(^2\), T. Ueno\(^3\)
\(^1\)Ichinoiseki National College of Technology, Iwate, Japan
\(^2\)Kumamoto University, Kumamoto, Japan
\(^3\)Oita 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. Tan\(^1\), P. Lee\(^1\), A. Talebitaher\(^1\), H. B. M. Sharifi\(^3\), S. V. Springham\(^1\), A. Shyam\(^3\), R. Rawat\(^1\)
\(^1\)Natural Sciences and Science Education, National Institute of Education, Nanyang Technological University, Singapore, Singapore
\(^2\)Institute for Plasma Research, Bhat, Gandhinagar, India
\(^3\)Energetics and Electromagnetic Division, Bhabha Atomic Research Centre, Autonagar, Vishakhapatnam, India

2P-82  **High Current All Solid State Sources for Laser Applications**
V. Efano\(^1\), M. Efanov, P. Yarin
FID GmbH, Burbach, Germany

2P-83  **Study of the Discharge Channel Evolution Characteristics in the Flashlamps**
X. Li\(^1\), S. Jia\(^1\), R. Li\(^1\), X. Song\(^1\), Z. Shi\(^1\), H. Li\(^2\)
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

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

Sliding Electrical Contact Test Stand Development
D. A. Rice, S. D. Kovaleski, J. M. Gahl
Electrical Engineering, University of Missouri, Columbia, Mo, United States

Low Voltage Low Current Massively Parallel High Performance EM Gun Topology MEMS Based Manufacturing
O. S. Zucker
Polarix Corporation, San Diego, CA, United States

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

Modeling of High Voltage Fast Recovery Diode in Pulsed Power Applications
Y. Zhou¹, 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

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

Structural Optimization of the Single-Stage Induction Coilgun Based on Finite Element Method
B. Zou
Naval Aeronautical and Astronautical University, Yantai, Shandong, China

Design of a Single Stage Supersonic Reluctance Coilgun
T. S. El-Hasan
Electrical Engineering, Zarqa University, Zarqa, Jordan

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 4A-1 (INVITED) Advanced Load Current Multiplier on Zebra Generator  
A. Chuvatin1, V. Kantsyrev2, A. Astanovitskiy1, R. Presura3, A. Safronova4, B. LeGalloudec2, V. Nalajala1, K. Williamson3, I. Shrestha2, G. Osborne1, M. Weller1, V. Shlyaptseva1, M. Cuneo1, L. Rudakov5  
1Laboratoire de Physique des Plasmas, Ecole Polytechnique, Palaiseau, France  
2Physics Department, University of Nevada, Reno, NV, United States  
3Sandia National Laboratories, Albuquerque, NM, United States  
4Icarus Research, Inc., Bethesda, MD, United States

4:00 4A-2 Status of the Z Pulsed Power Driver  
M. E. Savage1, D. S. Dry7, P. A. Corcoran1, K. R. LeChien1, M. R. Lopez1, J. A. Lott7, B. S. Stoltzfuß1, W. A. Stygar1  
1Sandia National Laboratories, Albuquerque, NM, United States  
2Ktech, Albuquerque, NM, United States  
3L3 Pulse Sciences, San Leandro, CA, United States  
4NNSA, Washington, DC, United States

4:15 4A-3 Particle in Cell Simulations of Plasma Dynamics in the Z Double-Post-Hole Convolute and Inner Magnetically Insulated Transmission Line  
S. W. Vickers2, J. Chittenden2  
2Hydrodynamics, AWE, Reading, United Kingdom  
3Plasma Physics, Imperial College, London, United Kingdom

4:30 4A-4 Design and Optimization of Planar Wire Array Loads for 1.7 MA LCM Current Regimes at Zebra Facility  
Department of Physics, University of Nevada Reno, Reno, NV, United States

4:45 4A-5 The Impact of Load Configuration and Wire Material on Radiation Yield from Wire Array Plasmas at University Scale Z-Pinch Pulsed Power Generators  
I. K. Shrestha1, V. L. Kantsyrev1, A. S. Safronova1, A. A. Esaulov1, A. Astanovitskiy1, K. M. Williamson1, G. C. Osborne1, M. E. Weller1, V. V. Shlyaptseva1, N. D. Ouart2  
1Department of Physics, University of Nevada Reno, Reno, NV, United States  
2Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States

5:00 4A-6 Simulations of Dynamic Laser / Plasma X-Ray Production  
D. R. Welch1, C. L. Miller1, D. V. Rose1, R. B. Campbell2, B. V. Oliver2, T. J. Webb2, D. G. Ficker2  
1Voss Scientific, LLC, Albuquerque, NM, United States  
2Sandia National Laboratories, Albuquerque, NM, United States

5:15 4A-7 Research of Non-Cylindrical Wire Arrays on ANGARA-5-1 Facility  
E. V. Grabovski1, V. P. Smirnov1, V. Aleksandrov1, M. Fedulov1, I. Frolov1, A. Gribov1, A. Gritsouk1, Y. Laukhin1, S. Medovshikov1, K. Mitrofanov1, G. Oleinik1, A. Samokhin1, G. Volkov1, V. Zaitsev1, P. Sasorov2, V. Gasilov1, S. D'yachenko1, O. Olkhovskaya1, A. Shevel'ko4, O. Yakushev4  
1SRC RF TRINITI, Troitsk, Russian Federation  
2ITEP, Moscow, Russian Federation  
3IMM RAS, Moscow, Russian Federation  
4FIAN, Moscow, Russian Federation

5:30 4A-8 Extreme State of Water Produced by Converging Strong Shock Waves Generated Using Underwater Electrical Wire Array Explosion  
Y. E. Krasik, A. Fedotov-Gefan, S. Efimov, L. Gilburn, V. Gurvich, G. Bazalitsky  
Physics Department, Technion, Haifa, Israel

Session 4B: Applications I: Fusion, EM, Beam, Laser, and Space Applications

Tuesday, June 21 3:30-5:30, Conference Center 10C-D

Session Chair: Weihua Jiang, Nagaoka University of Technology
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. Pasik³, R. S. Coats², T. D. Pointon², D. B. Seidel², G. R. McKee³, L. X. Schneider⁴
¹VanDevender Enterprises, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States

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

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

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

4B-5 Simulation of Diocotron Instability in a Magnetically Confined Hollow Electron Beam
H. J. Lee¹, M. Chung⁴, S. I. Chung¹
¹Department of Electrical Engineering, Pusan National University, Busan, South Korea
⁴Handong University, Pohang, South Korea

4B-6 Substrate Conditions in Low-Temperature Gallium Arsenide and Semi-Insulating Gallium Arsenide During Terahertz Pulse Generation
S. Ray¹, A. K. Alla¹, J. Yakura¹, P. Kirawanich², N. E. Islam¹
¹ECE, University of Missouri, Columbia, MO, United States
²ECE, Air Force Research Laboratory, Albuquerque, NM, United States

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

4B-8 Meridian Radar System - Klystron Based Transmitter for Atmospheric Research
P. Kolda¹, S. Lenci¹, Z. H. Ding², M. Kempkes², 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

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

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  
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  
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. Somerlink¹, M. Caron¹, B. Cassany², L. Voisin², T. Desanlis², B. Bicref², P. Modin², A. Garrigues³, C. Delbos³, I. Soleilhavoup³  
¹DIF / PEM, CEA, 51490Ponfaverger-Moronvilliers, France
10:45 5A-6 Generation Supershort Avalanche Electron Beam and X-Ray During Subnanosecond Breakdown in Different Gases at Pressures from 1 Torr Up To 15 Atm
V. F. Tarasenko
High Current Electronics Institute, Tomsk, Russian Federation

11:00 5A-7 3D Simulations of the Self-Magnetic-Pinch Diode
N. L. Bruner¹, D. R. Welch¹, B. V. Oliver², M. D. Johnston²
¹Voss Scientific, LLC, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States

11:15 5A-8 Multiple Pulsed Power Systems for Free Electron Maser Amplifier Experiments
C. G. Whyte, C. W. Robertson, K. Ronald, A. R. Young, W. He, A. W. Cross, P. Machnes, A. D. R. Phelps
SUPA, Physics, University of Strathclyde, Glasgow, United Kingdom

11:30 5A-9 Power Positron Beams for HED Physics
V. V. Gorev
Kurchatov Institute, Moscow 123182, Russian Federation

11:45 5A-10 Space-Charge Limited Current of Charged-Particle Beam in Coaxial Drift Tube
K. Ilyenko¹, G. V. Sotnikov², T. Y. Yatsenko¹
¹Department of Vacuum Electronics, Institute for Radiophysics and Electronics of NAS of Ukraine, Kharkiv, Ukraine
²National Science Center “Kharkiv Institute of Physics and Technology” of NAS of Ukraine, Kharkiv, Ukraine

Session 5B: Applications II: General Applications
Wednesday, June 22 9:30-12:00, Conference Center 10C-D
Session Chair: Bill Reass, Los Alamos National Laboratory

9:30 5B-1 (INVITED) European Laboratory for Pulsed Power Research (EPPL)
E. Spahn¹, J.-M. Löeffler², S. Balevicius³
¹ISL, Saint-Louis, France
²University of Applied Sciences, Gelsenkirchen, Germany
³Semiconductor Physics Institute, Vilnius, Lithuania

10:00 5B-2 The PHELIX Pulsed Power Project: Bringing Portable Magnetic Drive to World Class Radiography
Los Alamos National Laboratory, Los Alamos, NM, United States

10:15 5B-3 The Generation of Triggered Shockwaves in Shock Tubes with Exploding Wires
M. E. J. Rudroff, A. Lodes, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

10:30 5B-4 The Interaction of Shock Waves with a High Density Toroidal Air Plasma
A. Lodes, M. E. J. Rudroff, R. D. Curry
Dept. of Electrical & Computer Engineering, University of Missouri, Columbia, MO, United States

10:45 5B-5 The PHELIX Portable Pulsed Power Machine: Hydrodynamics Experiments and Beyond
Los Alamos National Laboratory, Los Alamos, NM, United States

11:00 5B-6 Design of Pulsed High-Field Magnets for Pion/Muon Collection
P. J. Turchi
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. Haill, 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. Urciuoli¹
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. Ogumiyi¹, 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. Wellemann, 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. Wellemann²
¹ABB Switzerland Ltd., Lenzburg, Switzerland
²ABB Switzerland Ltd., 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  
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. Garrod2, 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. Burtsey, 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. Mangassarian⁷, S. P. Obenschain¹, J. D. Sethian¹, W. Webster⁴, M. F. Woldord¹  
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  
Electronic and Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom

3P-17  The Effect of the Rate of Temperature Rise on Cell Survival  
S. Xiao¹,², T. J. Camp¹, Y. Jing¹, K. H. Schoenbach¹,²  
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. Osmiokrovic  
Faculty of Electrical Engineering, University of Belgrade, Belgrade, Serbia

3P-22  Effect of Pulsed Electric Fields In Human Blood Cells
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. Akiyama1,2  
1Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan  
2Bioelectricity 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  
1Applied Pulsed Power, Inc., Freeville, NY, United States  
2Weinberg Medical Physics LLC, Bethesda, MD, United States  
3University of Maryland, Baltimore, MD, United States

3P-28  Focusing System of Burst Electromagnetic Waves for Medical Applications  
M. Hashimoto1, H. Ishizawa1, H. Akiyama1,2, H. Hosseini1,2, S. Katsuki1,2  
1Graduate School of Science and Technology, Kumamoto University, Kumamoto City, Japan  
2Bioelectricity 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, Ymagata 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. Oide3, K. Abe3, S. Katsuki1, H. Akiyama3  
1New Frontier Sciences, Graduate School of Science and Technology, 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. Minamidani¹, 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. Xiao¹,², Y. Sun¹, K. H. Schoenbach¹,²  
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. Hosseini¹,², D. K. Kang¹, Y. Okuda¹, D. Oshita¹, H. Akiyama¹,²  
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. Hosseini², Y. Okuda¹, Y. Miyamoto¹, S. Iwasaki¹, H. Akiyama²,¹  
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**
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. Hosseini¹, D. K. Kang¹, T. Sakugawa¹, H. Akiyama¹
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. Hori
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. Katsuki¹, H. Akiyama¹
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. Guo³, Y. Wen², J. Tang³
¹Laboratory of Power Transmission Equipment and System Security and New Technology, Chongqing University, Chongqing, China
²First Affiliated Hospital, Chongqing Medical Science University, Chongqing, China
³Kumamoto University, Kumamoto, Japan
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

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

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

Vapor Deposition of Thermo-Sensitive Poly(N-Isopropylacrylamide) by Atmospheric Pressure Plasma
X. L. Tang1,2,3, Y. Chen1, B. T. Chen1, G. Qiu1,3
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

The PHELIX Liner Demonstration Experiment (PLD-1)
C. L. Rousculp1, W. A. Reass1, D. M. Oro1, D. B. Hollkamp1, 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

Achieving High Pressure Shock Hugoniot Measurements in Cylindrical Geometry Utilizing a High-Explosive Pulsed Power Drive
J. H. Peterson1, C. L. Rousculp1, D. B. Hollkamp2, D. M. Oro2, J. R. Griego2, W. L. Atchison1,
R. E. Reinovsky1
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

A New Magneto-Hydrodynamics Code Capability
A. M. Kaul
XCP Division, Los Alamos National Laboratory, Los Alamos, NM, United States

Numerical Modelling of a Foil-Flyer Electromagnetic Accelerator
B. M. Novac1, I. R. Smith1, K. Omar1,2, N. Graneau2, M. Sinclair2
1Electronic and Electrical Engineering Department, Loughborough University, Loughborough, United Kingdom
2Hydrodynamics Division, AWE Aldermaston, Reading, United Kingdom

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

Ozone Generation Using Positive- and Negative- Nano-Seconds Pulsed Discharges
N. Takamura1, T. Matsumoto1, D. Wang2, T. Namihira1, 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

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. Penael, J.-P. Davis1, C. A. Hall1, R. J. Hickman1, K. C. Hodge2, R. W. Lenke1, J. M. Lehr1, D. J. Lucero2, D. H. McDaniel1, J. G. Puissant2, J. M. Rudys3, M. E. Sceiford1, S. J. Tullar1, 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. Ormon2, 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. Wastell2
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. Redondo1,2, F. H. M. Cavalcante1,2, H. Canacsinh1,2, M. T. Pereira1, 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. Pereira1,2, H. Canacsin2, J. P. Mendes2,3, P. Tavares3, L. M. Redondo2,3
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
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

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

Design and Evaluation of a Water Blumlein Pulse Generator
H. Heo, O. R. Choi, S. H. Nam
Pohang Accelerator Laboratory, Pohang, Kyungbuk, South Korea

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

Repellent 300 kV Pulse Generator with Blumlein Pulse Forming Line
S. W. Lim¹, C. H. Cho², J. S. Kim³, Y. B. Kim⁴, H. J. Ryoo⁵, Y. S. Jin⁶
¹Dept. of Energy Conversion Technology, University of Science & Technology, Changwon, South Korea
²Industry Application Research Division, Korea Electrotechnology Research Institute, Changwon, South Korea

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

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

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

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

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

Improved Hybrid MOSFET/Driver Switching Module for Pulsed Power Applications
T. Tang, C. Burkhard
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. Rathsman²

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. Park¹,², 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. Baba³

¹Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan
²Suematsu Electronics Co. Ltd., Yatsushiro, Kumamoto, Japan
3P-98 TT-MoS Concept for Modern Modular High Current Power Supplies
M. Hohmann
Transtechnik GmbH & Co.KG, Munich/Holzkirchen, Germany

3P-99 Recharge of Electrochemical Energy Storage Devices at Pulsed Elevated Rates
P. M. Novak, D. A. Wetz, B. Shrestha
Electrical Engineering, University of Texas at Arlington, Arlington, TX, United States

3P-100 Suppressing Thermal Energy Drift in the LLNL Flash X-Ray Accelerator Using Linear Disk Resistor Stacks
B. R. Kreitzer, T. L. Houck, O. C. Luchterhand
NSED, Lawrence Livermore National Laboratory, Livermore, CA, United States

3P-101 Klystron Modulator Technology Challenges for the Compact Linear Collider (CLIC)
D. Aguglia¹, C. de Almeida Martins², D. Nisbet¹, D. Siemaszko³, E. Sklavounou¹, P. Viarouge²
¹Technology Dept., Electric Power Converter Group, CERN - European Organization for Nuclear Research, Geneva, Switzerland
²Electrical and Computer Engineering Dept., LEEPCI Lab, Laval University, Quebec, Quebec, Canada

3P-102 Modeling Solid-State Marx Generator Parasitic Capacitances for Optimization Studies
H. Canacsinh¹, L. M. Redondo¹, J. F. Silva¹,²
¹Instituto Superior de Engenharia de Lisboa, Lisbon, Portugal
²Nuclear Physics Center from Lisbon University, Lisbon, Portugal

3P-103 Voltage Quality Enhancement Using Dynamic Voltage Restorer: Voltage Sag & Simulation
O. Tasin
Electrical Engineering, Istanbul Technical University, Istanbul, Turkey

3P-104 Mathematical Modeling of a Solid State Pulse Power Modulator
H. P. Taskar, V. C. Chinde, H. M. Mangalvedekar, N. M. Singh
Electrical, V.J.T.I. Mumbai, Mumbai, India

3P-105 Starting and Control of an Air-Cored High-Speed AFPM Starter / Generator
T. S. El-Hasan¹, M. A. Elnasser²
¹Electrical Engineering Department, Zarqa University, Zarqa, Jordan
²R&D, Al Hudhud For Vehicle Tracking Systems Co., Amman, Jordan

Session 6A: Radiation Sources II: High Power Diodes

Wednesday, June 22 3:30-5:30, Conference Center 10A-B

Session Chair: Robert Commissio, Naval Research Laboratory

3:30 6A-1 An Analysis of Intense Pulsed Active Detection (IPAD) System for the Detection of Special Nuclear Materials
S. B. Swanekamp, J. P. Apruzese, R. J. Commissio, D. Mosher, J. W. Schumer
Physics Physics Division, Naval Research Laboratory, Washington, DC, United States

3:45 6A-2 (INVITED) High-Power, Pulsed Bremsstrahlung Source for Inducing Photo-Fission
D. D. Hinshelwood¹, R. J. Allen¹, J. P. Apruzese¹, R. J. Commissio¹, G. Cooperstein²,
J. W. Schumer¹, S. B. Swanekamp¹, B. V. Weber¹, F. C. Young², S. L. Jackson¹, D. Mosher²,
D. P. Murphy¹, P. F. Ottinger²
¹NRL, Washington, DC, United States
²L3 Communications, Chantilly, VA, United States

4:15 6A-3 A Computation-Based Analysis of Photon-Induced Fission
D. Mosher, J. W. Schumer, J. P. Apruzese, R. J. Commissio, D. D. Hinshelwood, S. L. Jackson,
D. P. Murphy, S. B. Swanekamp
Code 6770, Plasma Physics Div., Naval Research Laboratory, Washington, DC, United States
6A-4  6-7 MeV Characteristic Gamma Source Using a Plasma Opening Switch and a Marx Bank
B. V. Weber¹, S. L. Jackson¹, D. G. Phipps¹, S. J. Stephanakis²
¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States
²L-3 Communications, Chantilly, VA, United States

6A-5 Advanced Particle-in-Cell Techniques for Pulsed Power Device and HEDP Simulation
D. R. Welch¹, R. E. Clark¹, C. Thomas¹, N. L. Bruner¹, T. C. Genoni¹, C. Mostrom¹, D. V. Rose¹,
B. V. Oliver², M. D. Johnson², W. A. Stygar²
¹Voss Scientific, Albuquerque, NM, United States
²Sandia National Laboratories, Albuquerque, NM, United States

6A-6 The Quantitative Effect of Anode Plasma on a Pinched Electron Beam from Particle in
Cell Modelling of a Self Magnetic Pinch Diode
P. N. Martin¹, J. R. Threadgold¹, D. R. Welch²
¹AWE, Reading, United Kingdom
²Voss Scientific, LLC, Albuquerque, NM, United States

6A-7 High-Current Reflex Triode Research
D. P. Murphy¹, B. V. Weber¹, S. B. Swanekamp¹, R. J. Commissio¹, R. J. Allen¹, J. R. Goyer²,
J. C. Riordan²
¹Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States
²Pulse Sciences Division, L-3 Communications, San Leandro, CA, United States

Session 6B: Power Electronics I: Power Electronics and Prime Power

Wednesday, June 22  
3:30-5:30, Conference Center 10C-D

Session Chair: Ivor Smith, Loughborough University

3:30  6B-1 Discharge of Electrochemical Energy Storage Devices at Elevated Rates for Driving
Pulsed Power Applications
B. Shrestha, D. A. Wetz, P. Novak
Electrical Engineering, University of Texas at Arlington, Arlington, TX, United States

3:45  6B-2 Green Pulsed Power Achieved by Efficient Solid State Pulsed Power Technology
M. Lindholm, W. Crewson, K. Elmquist
ScandiNova Systems AB, Uppsala, Sweden

4:00  6B-3 (INVITED) Circuit Modeling of Thermal Batteries for Pulsed Power Application
D. R. Myers, J. M. Gahl
Department of Electrical and Computer Engineering, University of Missouri, Columbia, MO, United States

4:30  6B-4 Unique High Energy Test Bed for Experimental Thyristors Devices
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

4:45  6B-5 Enhanced MOSFET Gate Driver for IVA Based Pulsed Power Module
P. Iyengar¹, J. E. Fletcher¹, D. J. Bittlestone², S. J. Finney¹, M. A. Sinclair²
¹Electronic and Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom
²Pulsed Power Group, Atomic Weapons Establishment, Aldermaston, United Kingdom

5:00  6B-6 Modeling and Characterization of VSCF 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 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.
S. F. Glover\textsuperscript{1}, L. X. Schneider\textsuperscript{1}, K. W. Reed\textsuperscript{1}, G. E. Pena\textsuperscript{1}, J. -P. Davis\textsuperscript{1}, C. A. Hall\textsuperscript{1}, H. L. Hanshaw\textsuperscript{2}, R. J. Hickman\textsuperscript{1}, K. C. Hodge\textsuperscript{2}, R. W. Lemke\textsuperscript{1}, J. M. Lehr\textsuperscript{1}, D. J. Lucero\textsuperscript{2}, D. H. McDaniel\textsuperscript{1}, J. G. Puissant\textsuperscript{2}, J. M. Rudys\textsuperscript{1}, M. E. Sceiford\textsuperscript{1}, S. J. Tullar\textsuperscript{2}, D. M. Van De Valde\textsuperscript{3}, F. E. White\textsuperscript{2}, L. K. Warne\textsuperscript{1}, R. S. Coats\textsuperscript{1}, R. E. Jorgenson\textsuperscript{1}, W. A. Johnson\textsuperscript{1}
\textsuperscript{1}Sandia National Laboratories, Albuquerque, NM, United States
\textsuperscript{2}Ktech Corporation, Albuquerque, NM, United States
\textsuperscript{3}EG&G, Albuquerque, NM, United States

10:00  7A-2 Isentropic Compression Studies at the Los Alamos National High Magnetic Field Laboratory
D. G. Tasker\textsuperscript{1}, C. H. Mielke\textsuperscript{2}, G. Rodriguez\textsuperscript{3}, D. G. Rickel\textsuperscript{2}
\textsuperscript{1}WX-6, Los Alamos National Laboratory, Los Alamos, NM, United States
\textsuperscript{2}MPA-CMMS, Los Alamos National Laboratory, Los Alamos, NM, United States
\textsuperscript{3}MPA-CINT, Los Alamos National Laboratory, Los Alamos, NM, United States

10:15  7A-3 Cygnus Dosimetry
J. R. Smith\textsuperscript{1}, D. S. Nelson\textsuperscript{2}, E. C. Ormond\textsuperscript{2}, S. R. Cordova\textsuperscript{2}, I. Molina\textsuperscript{3}, D. E. Good\textsuperscript{4}, M. D. Hansen\textsuperscript{4}, D. J. Henderson\textsuperscript{1}, K. W. Hogge\textsuperscript{2}, C. V. Mitton\textsuperscript{1}
\textsuperscript{1}Los Alamos National Laboratory, Los Alamos, NM, United States
\textsuperscript{2}Sandia National Laboratories, Mercury, NV, United States
\textsuperscript{3}Great Basin Technology, Inc., Albuquerque, NM, United States
\textsuperscript{4}National Security Technologies, North Las Vegas, NV, United States

10:30  7A-4 Transformer-Based, Repetitive Pulsed Power Driver for a Dense Plasma Focus
C. James\textsuperscript{1}, B. Bures\textsuperscript{1}, R. E. Madden\textsuperscript{1}, M. Krishnan\textsuperscript{1}, R. Adler\textsuperscript{2}
\textsuperscript{1}Alameda Applied Sciences Corporation, San Leandro, CA, United States
\textsuperscript{2}Northstar 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. Zhang\textsuperscript{1}, A. Agarwal\textsuperscript{1}, C. Capell\textsuperscript{1}, M. O’Loughlin\textsuperscript{1}, A. Burk\textsuperscript{1}, J. Sumakeris\textsuperscript{1}, J. Palmour\textsuperscript{1}, V. Temple\textsuperscript{2}, A. Ogunniyi\textsuperscript{3}, H. O’Brien\textsuperscript{1}, C. Scozzie\textsuperscript{1}
\textsuperscript{1}Power R&D, Cree, Inc., Durham, NC, United States
\textsuperscript{2}Silicon Power Corporation, Clifton Park, NY, United States
\textsuperscript{3}Army 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. Eremov 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. Eremov 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. Hosseini1,2, E. Shiraishi1, M. Yamanaka1, H. Akiyama1,2
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. Mir3
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. Bajracharya1,2, S. Xiao1,2, K. H. Schoenbach1
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. Katsuki1,2, H. Akiyama1,2, 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. Tokuchi1,2
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. Gisselmann
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$^1$, W. Jiang$^2$
$^1$Pulsed Power Japan Laboratory Ltd., Kustsu, Shiga, Japan
$^2$Extreme 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