

Date: Tuesday, 28/May/2024

1:00pm - 5:00pm	Registration
6:00pm - 8:00pm	Welcome Reception Location: White River A-E

Date: Wednesday, 29/May/2024

7:30am - 8:30am	Breakfast Location: White River A-E
7:30am - 8:30am	Authors' Breakfast Location: Room 105
8:30am - 9:30am	Plenary Lecture - Dr. Tom Huiskamp, The Germeshausen Award Location: White River F-J
9:30am - 10:00am	Coffee Break Location: White River A-E
10:00am - 12:00pm	HPM and Repetitive Pulsed Power Location: White River F Session Chair: Emma N. Guerin , University of Michigan
10:00am - 12:00pm	Flashover Location: White River G-J Session Chair: George Laity , Los Alamos National Laboratory
12:00pm - 1:30pm	Lunch (on your own)
1:30pm - 3:00pm	Poster Session 1 Location: White River A-E
3:00pm - 3:30pm	Coffee Break Location: White River A-E
3:30pm - 5:30pm	Power Electronics and Biological Location: White River F Session Chair: Howard Sanders , Sanders Pulsed Power LLC
3:30pm - 5:30pm	Gas Breakdown Location: White River G-J Session Chair: Adam Michael Steiner , Sandia National Laboratories
6:00pm - 9:30pm	Conference Social Night

Date: Thursday, 30/May/2024

7:30am - 8:30am	Breakfast Location: White River A-E
7:30am - 8:30am	Authors' Breakfast Location: Room 105
8:30am - 9:30am	Plenary Lecture - Dr. Laurent Pecastaing - The Sol Schneider Award Location: White River F-J
9:30am - 10:00am	Coffee Break Location: White River A-E
10:00am - 12:00pm	Solid & Liquid Breakdown Location: White River F Session Chair: Joshua Leckbee , Sandia National Laboratories
10:00am - 12:00pm	HV and EM Launchers Location: White River G-J Session Chair: Richard Ness , ARRS Technologies LLC
12:00pm - 1:30pm	Lunch (on your own)
1:30pm - 3:00pm	Poster Session 2 Location: White River A-E
3:00pm - 3:30pm	Coffee Break Location: White River A-E
3:30pm - 5:30pm	Solid State Pulse Generators Location: White River F Session Chair: Rob Saethre , Oak Ridge National Laboratory
3:30pm - 5:30pm	Plasma Discharges Location: White River G-J

White River G-J	■ Session Chair: Zach C. Shaw , Nevada National Security Sites
6:30pm - 7:30pm	Conference Banquet Reception Location: White River A-E
White River A-E	
7:30pm - 9:30pm	Conference Banquet Location: White River F-J
White River F-J	

Date: Friday, 31/May/2024

7:30am - 8:30am	Breakfast Location: White River A-E
White River A-E	
7:30am - 8:30am	Authors' Breakfast Location: Room 105
Room 105	
8:30am - 9:30am	Plenary Presentation: Dr. Jin Wang - The William G. Dunbar Award Location: White River F-J
White River F-J	
9:30am - 10:00am	Coffee Break Location: White River A-E
White River A-E	
10:00am - 12:00pm	Switches Location: White River F Session Chair: David Wetz , UT Arlington
White River F	
10:00am - 12:00pm	Analytical Methods Location: White River G-J Session Chair: Adam Michael Darr , Sandia National Laboratories
White River G-J	
12:30pm - 5:00pm	IPHVC ExCom Committee (Closed Meeting) Location: Room 105
Room 105	

Date: Saturday, 01/June/2024

8:30am - 12:30pm	Short Course: Circuit and Field Simulations in High Voltage Power Supply (HVPS) Practice Location: Room 105 Session Chair: Alex Pokryvailo , Spellman High Voltage Electronics Corp.
Room 105	
8:30am - 12:30pm	Short Course: Pulsed Power Accelerators and Their Architectures Location: Room 106 Mark Sinclair from the Atomic Weapons Establishment (AWE), Mark Johnston from Sandia National Laboratories and the University of New Mexico, and Chris Grabowski from Sandia National Laboratories.
Room 106	
1:00pm - 5:00pm	Short Course: Dielectric Measurement and Analysis Location: Room 106
Room 106	

Presentations

HPM and Repetitive Pulsed Power

Time: Wednesday, 29/May/2024: 10:00am - 12:00pm · *Location:* White River F

Session Chair: Emma N. Guerin, University of Michigan

Maximum number of presentations for this session: 6

10:00am - 10:20am

High Power Microwave Research at the University of Michigan

N. M. Jordan, R. A. Revolinsky, C. J. Swenson, E. N. Guerin, A. Brusstar, Y. Lau, R. D. McBride, R. M. Gilgenbach

University of Michigan, Ann Arbor, MI, USA

10:20am - 10:40am

Investigation of Pulsed Nanocrystalline Magnetic Core Behavior

K. Kelp¹, D. Wright¹, J. Stephens¹, J. Mankowski¹, J. Dickens¹, Z. Shaw², A. Neuber¹

¹Texas Tech University, Center for Pulsed Power and Power Electronics; ²Mission Support and Test Services

10:40am - 11:00am

A Solid State, Composite-Based Nonlinear Transmission Line with Exponential Taper for Microwave Generation

T. D Crawford, A. Garner

Purdue University, United States of America

11:00am - 11:20am

Solid-state power amplifier for high power microwave generation

M. R LaPointe, J. C Stephens, S. B Bayne

Pulsed Power and Power Electronics Laboratory at Texas Tech University, United States of America

11:20am - 11:40am

RF Magnetoelectric and Magnetodielectric Materials and Their Potential Applications in High Power Microwave (HPM)

N. Sun

Northeastern University, United States of America

11:40am - 12:00pm

Aspects of Comprehensive Design of High-Power Magnetrons

E. Szkop¹, M. Błażejewicz¹, D. Baczewski¹, A. Różycki¹, M. Tomczak¹, D. Laskowski²

¹Kubara Lamina S.A., Poland; ²Military University of Technology in Warsaw, Poland

Flashover

Time: Wednesday, 29/May/2024: 10:00am - 12:00pm · *Location:* White River G-J

Session Chair: George Laity, Los Alamos National Laboratory

Maximum number of presentations for this session: 6

10:00am - 10:20am

Electrical Measurements of Anode-Initiated Vacuum Surface Flashover in a Pin-Plane Geometry

W. Brooks¹, J. Sceiford¹, R. Clark¹, J. Stephens¹, J. Mankowski¹, J. Dickens¹, A. Steiner², A. Neuber¹

¹Texas Tech University, Center for Pulsed Power, 910 Boston Ave., Lubbock, TX 79415; ²Sandia National Labs, 1515 Eubank Blvd. SE, Albuquerque, NM 87123

10:20am - 10:40am

An Apparatus for the Measurement of Field Emission from Insulators

R. Clark¹, L. Boswell¹, J. Stephens¹, J. Dickens¹, J. Mankowski¹, A. Steiner², A. Neuber¹

¹Texas Tech University, Lubbock, TX, USA; ²Sandia National Laboratories, Albuquerque, NM, USA

10:40am - 11:00am

An Experimental Comparative Analysis on Surface Discharges under Aircraft Operational Pressure Range

M. Hamidieh, S. P. Kalakonda, M. Ghassemi

The University of Texas at Dallas, United States of America

11:00am - 11:20am

Multipactor and Mitigation in X-band Waveguide

H. N. Spencer, D. Wright, A. Gregory, J. Mankowski, J. Stephens, J. Dickens, A. Neuber

Texas Tech University, United States of America

11:20am - 11:40am

Multipactor Discharge with Engineered RF Fields

A. Iqbal¹, D.-Q. Wen¹, M. Mashrafi¹, P. Wong³, S. Lin², J. Verboncoeur¹, P. Zhang¹

¹Michigan State University, United States of America; ²Xi'an Jiaotong University, China; ³N/A

11:40am - 12:00pm

Influence of High Approach Speeds on Electrostatic Discharge Characteristics

B. Esser¹, J. C. Stephens¹, J. C. Dickens¹, J. J. Mankowski¹, D. R. Friesen², D. Hattz³, C. D. Nelson³, A. A. Neuber³

¹Texas Tech University; ²Mission Engineering Group, CNS Pantex; ³Facility Engineering Electromagnetic Group, CNS Pantex

Poster Session 1

Time: Wednesday, 29/May/2024: 1:30pm - 3:00pm · Location: White River A-E

P1-01 Impact of Mechanical Tolerances on Partial Turn Skipping in Helical Flux Compression Generator

K. Schrinier¹, N. Fryar¹, J. Stephens¹, J. Dickens¹, A. Young², A. Neuber¹

¹Texas Tech University, United States of America; ²Lawrence Livermore National Laboratory, United States of America

P1-02 A New Topology for 2D Transmission Line Array Circuit Simulations*

R. Allen, B. Weber

Naval Research Laboratory, United States of America

P1-03 Experimental Analysis of Simulated Lightning Strikes Upon 1/4-Scaled Rebar Structure

A. Solis, A. Hewitt, C. Lynch, J. Mankowski, J. Dickens, A. Neuber, J. Stephens, C. Noltensmeyer, C. Nelson, D. Friesen, D. Hattz, E. Alva

Texas Tech University Center for Pulsed Power and Power Electronics, United States of America

P1-04 Experimental validation of Heat Transfer simulations for EPR – Insulated Power Cables under MVDC stress for All Electric Aircraft

C. D. Rodriguez Reyes¹, A. Samimi Motlagh¹, J. M Lehr¹, M. Ghassemi²

¹University of New Mexico, United States of America; ²The University of Texas at Dallas

P1-05 Thermal Models for Power IGBTs in Pulsed Power Applications

M. G. Giesselmann¹, K. R Rodriguez¹, J. Mayes²

¹Pulsed Power Lab, ECE Dept., Texas Tech University, Lubbock, Texas, USA; ²Applied Physical Electronics, LC, Spicewood, Texas, USA

P1-06 A short-circuit forming line as an opening switch for pulse power application

O. Egorov

Russian Federation

P1-07 Massively Parallelized High-Current Switching with Sub-2 ns Transitions

A. Vellozzi¹, M. Henry¹, A. Henson¹, K. Miller¹, J. Zuraw¹, J. Prager¹, I. Cohen², J. Walker², D. Harthan², L. Caskey², Z. Roberts²

¹Eagle Harbor Technologies, Inc., United States of America; ²Radiance Technologies

P1-08 Development of a circuit modeling capability for semiconductor opening switch-based pulsed power systems

H. N. Spencer, B. Esser, J. Dickens, A. Neuber, J. Mankowski, J. Stephens

Texas Tech University, United States of America

P1-09 High Voltage Testing of Ammonothermal Grown GaN

A. K. Gregory¹, M. Gaddy¹, T. Hashimoto², E. Letts², D. Key², J. Mankowski¹, A. Neuber¹, J. Dickens¹

¹TTU, United States of America; ²SixPoint Materials Inc.

P1-10 A modular Pulser test Bed for characterization of solid-state opening Switches

B. Esser, H. N. Spencer, J. C. Stephens, J. C. Dickens, J. J. Mankowski, A. A. Neuber

Texas Tech University, United States of America

P1-11 Transient Simulations in Silvaco Atlas for a N-type SiC Drift Step Recovery Diode

D. Z. Graves¹, M. Lehmann¹, A. V. Bilbao¹, S. B. Bayne¹, E. A. Schrock²

¹Texas Tech University, 1012 Boston Ave., Lubbock, TX 79409; ²Sandia National Laboratories, 1515 Eubank SE Albuquerque, MN 87123

P1-12 Upgrading the LCLS-II System to Meet 929 kHz Requirements

S. T. Harave, T. Beukers

SLAC National Accelerator Laboratory, Menlo Park, CA, USA.

P1-13 Design and Development of a Gate Drive Power Supply for Solid State Pulsed Power Systems

A. Lanter¹, J. Dyer¹, I. J. Cohen¹, C. Elliott², M. Rader²

¹Radiance Technologies, Huntsville, AL, USA; ²US Army Space and Missile Defense Command, Redstone Arsenal, AL, USA

P1-14 Thermal Characterization of GaN Switches in Pulsed Power Converters

A. Lands¹, J. Dyer¹, I. J. Cohen¹, W. Thames¹, J. Walker¹, C. Elliott², M. Rader²

P1-15 Development of Ga2O3 power devices and their potential impact to HVDC applications

A. Sircar, X. Yao

University at Buffalo, United States of America

P1-16 A Review of High Voltage Challenges and Developments of Power Electronics Packaging

L. Zheng^{1,2}, S. Ji¹, X. Yao²

¹Xi'an Jiaotong University, Xi'an, Shaanxi, China; ²The State University of New York at Buffalo, United States of America

P1-17 Pulsed Power Systems for Plasma Generation and Compression at General Fusion

B. Rablah, D. Ross, M. Laberge, J. Smith, G. Faust, J. Gorenstein

General Fusion Inc., Canada

P1-18 Inhibition of Conversion Myoglobin to Metmyoglobin in Red Fish Meat by Applying Pulsed High Electric Field

K. Saito¹, S. Kosugi¹, K. Kawasaki¹, Y. Minamitani¹, R. Sawada²

¹Department of Informatics and Electronics, Yamagata University, Japan; ²Kyokuyo Co., LTD, Japan

P1-19 Power Systems for Cardiac Pulsed Field Ablation

A. Henson, K. Miller, J. Prager, T. Ziemba

Eagle Harbor Technologies, Inc., United States of America

P1-20 High Intensity Microsecond-Electric Pulses Modulate Cell Death in Triple Negative Breast Cancer cells treated with Resveratrol.

P. Giri¹, I. Camarillo^{2,3}, R. Sundararajan¹

¹School of Engineering Technology, Purdue University, USA; ²Department of Biological Sciences, Purdue University, USA; ³Purdue Cancer Institute, Purdue University, USA

P1-21 Study on Selection of appropriate Conditions of nanosecond pulsed electric Field for Activation of unfolded Protein Response using GFP-expressing Cells.

M. Hirata¹, S. Tanioka¹, Y. Hamada², S. Oyadomari², N. Shimomura³

¹Graduate of Electrical and Electronic Engineering, Tokushima University, Japan; ²Institute of Advanced Medical Sciences Tokushima University, Japan; ³Graduate School of Technology, Industrial and Social Sciences Tokushima University, Japan

P1-22 Study on the Effect of nanosecond pulsed electric Fields (nsPEFs) on Cancer Tumors in embryonic Chick Assay

Y. Koide¹, Y. Kobayashi², H. Morita², N. Shimomura³

¹Electrical and Electronic Engineering Tokushima University Tokushima, Japan; ²Graduate school of Electrical and Electronic Engineering Tokushima University Tokushima, Japan; ³Graduate School of Technology, Industrial and Social Sciences Tokushima University Tokushima, Japan

P1-23 Testing and qualification of hermetically sealed DC contactors as switching elements in 600 ADC Energy Extraction Systems in the superconducting circuits in the large hadron collider installations

G. Coelingh, J.-E. Aas, D. Carrillo, B. Panev, S. Pemberton, M. Pojer

CERN, Switzerland

P1-24 Construction of Mechanical-Electrical Combined Load Partial Discharge Measurement System

H. Watanabe, Y. Hayase

Fuji Electric, Japan

P1-25 A self-matching Cable Pulse Generator for high Voltage and fast Risetime Applications

L. D. Boswell¹, R. Clark¹, J. Dickens¹, J. Mankowski¹, A. Steiner², A. Neuber¹

¹Texas Tech University, United States of America; ²Sandia National Laboratories, United States of America

P1-26 Calibration Method for Current Monitors on a High Current Pulsed-Power Accelerator

S. Hernandez, S. Divett, R. Mourning, W. Roundy, K. Chandler, C. Jennings, M. Gomez, J. Leckbee

Sandia National Laboratories

P1-27 Development of an Induction Coilgun with Variable Launching Angle Configurations

M. Yadav, J. T. Meledath, D. Kaushik

Pulsed Power Lab, Indian Institute of Science, Bengaluru, India

Power Electronics and Biological

Time: Wednesday, 29/May/2024: 3:30pm - 5:30pm · *Location:* White River F

Session Chair: Howard Sanders, Sanders Pulsed Power LLC

Maximum number of presentations for this session: 6

3:30pm - 3:50pm

High-intensity pulse treatment modulates the electron transport chain in MDA-MB-468 human triple-negative breast cancer cells treated with Metformin

P. Sahu¹, I. Camarillo^{2,3}, R. Sundararajan¹

¹School of Engineering Technology, Purdue University, West Lafayette, Indiana 47907, USA; ²Department of Biological Sciences, Purdue University, West Lafayette, Indiana 47907, USA; ³Purdue University Center for Cancer Research, West Lafayette, Indiana 47907, USA

3:50pm - 4:10pm

Electric Field Measurements in a Nanoscond Pulsed Helium Plasma Jet Impinging Biomaterials Using E-FISH

E. Oshin¹, M. Z. Rahman¹, A. Dogariu², C. Jiang¹

¹Frank Reidy Research Center for Bioelectrics, Old Dominion University Norfolk, VA 23455 USA; ²Department of Aerospace Engineering, Texas A & M University, College Station, Texas 77843, USA

4:10pm - 4:30pm

Optimal Parameter Identification and Extraction of the Solar Module Using Empirical and Quasi-Newton Optimisation Methods

J. Isabona¹, I. Odesanya², D. Ibitayo Lanlege³

¹DLS2 Amazon, LS9, Leeds; ²Federal University Lokoja, Kogi State; ³Federal University Lokoja, Kogi State

4:30pm - 4:50pm

Comparison of Inductive Generators (IG) built on common magnetic core and separate cores

A. Pokryvailo

Spellman High Voltage Electronics Corp., United States of America

4:50pm - 5:10pm

Modular kW-Class Pulsed Power Capacitor Charger for High Frequency Applications

W. Thames¹, J. Dyer¹, I. J. Cohen¹, A. Lands¹, J. Strouse¹, C. Elliott², M. Rader²

¹Radiance Technologies, Huntsville, AL, USA; ²US Army Space and Missile Defense Command, Redstone Arsenal, AL, USA

5:10pm - 5:30pm

160kV High Voltage Power Modulator for CNT X-ray Generator

W.-C. Jeong, H.-J. Ryoo

Chung-Ang University, Korea, Republic of (South Korea)

Gas Breakdown

Time: Wednesday, 29/May/2024: 3:30pm - 5:30pm · Location: White River G-J

Session Chair: Adam Michael Steiner, Sandia National Laboratories

Maximum number of presentations for this session: 6

3:30pm - 3:50pm

A Comparison of the optical Emission Spectra of insulating Gases during pulsed Discharge

L. D. Boswell¹, L. Silvestre¹, J. Matthies¹, N. Fryar¹, K. Schriener¹, J. Stephens¹, J. Dickens¹, J. Mankowski¹, A. Young², A. Neuber¹

¹Texas Tech University, United States of America; ²Lawrence Livermore National Laboratory, United States of America

3:50pm - 4:10pm

Hold-off and Nanosecond-Scale Delay Times of C4F7N Electric Breakdown compared to other Insulating Gases at up to 4 atm Pressure†

J. A. Matthies¹, L. Silvestre¹, N. Fryar¹, J. Stephens¹, J. Mankowski¹, J. Dickens¹, A. Young², A. Neuber¹

¹Texas Tech University, Lubbock, TX; ²Lawrence Livermore National Laboratories, Livermore, CA

4:10pm - 4:30pm

Gas Breakdown at Intermediate Pressure and Gaps

L. I. Breen¹, S. Mahajan¹, A. Semnani², A. M. Loveless¹, A. L. Garner¹

¹Purdue University, West Lafayette, IN 47907 USA; ²The University of Toledo, Toledo, OH

4:30pm - 4:50pm

Extending Microscale Gas Breakdown Theory to AC Fields

S. Mahajan¹, H. Wang¹, A. M. Loveless¹, A. Semnani², V. Ayyaswamy³, L. I. Breen¹, A. L. Garner¹

¹Purdue University, United States of America; ²University of Toledo, United States of America; ³University of California-Merced, United States of America

4:50pm - 5:10pm

Spark Gap Impedance Collapse and Current Rise Times in modern insulating Gas Mixtures +

L. Silvestre¹, J. Matthies¹, N. Fryar¹, J. Stephens¹, J. Mankowski¹, J. Dickens¹, A. Young², A. Neuber¹

¹Texas Tech University, Lubbock, TX; ²Lawrence Livermore National Laboratory, Livermore, CA

5:10pm - 5:30pm

Self-Breakdown Distribution Analysis of a 100 kV Gas Switch with Varying Hardware Variables

J. Felix, B. Stoltzfus, M. Savage, J. Leckbee, A. Steiner, B. Hutsel

Sandia National Laboratories, United States of America

Solid & Liquid Breakdown

Time: Thursday, 30/May/2024: 10:00am - 12:00pm · *Location:* White River F

Session Chair: Joshua Leckbee, Sandia National Laboratories

Maximum number of presentations for this session: 6

10:00am - 10:20am

Prototyping Aircraft MVDC Power Cables with Optimal Multilayer Multifunctional Electrical Insulation Systems

A. Saha¹, M. A. Rahman¹, M. Ghassemi¹, J. Lehr²

¹The University of Texas at Dallas, Department of Electrical and Computer Engineering, Richardson, TX, USA; ²University of New Mexico, Department of Electrical and Computer Engineering, Albuquerque, UM, USA

10:20am - 10:40am

The Influence of Low Pressure on Dielectric Strength of Aircraft MVDC Power Cables

S. Chowdhury¹, M. A. Rahman¹, A. Saha¹, M. Ghassemi¹, J. Lehr²

¹The University of Texas at Dallas, United States of America; ²University of New Mexico, Department of Electrical and Computer Engineering, Albuquerque, UM, USA

10:40am - 11:00am

A New Nanodielectric Liquid Using a Multi-Nanoparticle System for Heat Transfer in 3D Heterogeneous Microsystems

S. P. Kalakonda, M. Ghassemi, R. Henderson

The University of Texas at Dallas, Department of Electrical and Computer Engineering, Richardson, TX, USA

11:00am - 11:20am

An Experimental Investigation of Partial Discharge Mitigation by Nonlinear Field-Dependent Conductivity Layers within (U)WBG-based Power Module Packaging under High Frequency, High Slew Rate Voltage Pulses

P. Adhikari, M. Ghassemi

The University of Texas at Dallas, United States of America

11:20am - 11:40am

Diagnosing Failure Mechanisms in Capacitors Within Pulsed Power Usage

V. Popa-Simil, D. A. Smith, L. Romero, B. A. Quintana

Los Alamos National Laboratory, United States of America

11:40am - 12:00pm

On Electromechanical Breakdown of Solids in Strongly Nonuniform Fields

A. Pokryvailo

Spellman High Voltage Electronics Corp., United States of America

HV and EM Launchers

Time: Thursday, 30/May/2024: 10:00am - 12:00pm · *Location:* White River G-J

Session Chair: Richard Ness, ARRS Technologies LLC

Maximum number of presentations for this session: 6

10:00am - 10:20am

The Variable Edge Time Surge Generator for High Voltage Insulation Testing

M. Damev¹, N. Frost²

¹Phenix Technologies, A Doble Company, United States of America; ²Frosty's Zap Lab, LLC, United States of America

10:20am - 10:40am

Retrofitted RITS Marx Generator for Laser Triggered Gas Switch Testing

K. Allen¹, M. Flynn¹, J. Mockert¹, J. Mankowski¹, A. Neuber¹, J. Dickens¹, J. Smith², A. Steiner², J. Leckbee²

¹Texas Tech University, United States of America; ²Sandia National Laboratories, United States of America

10:40am - 11:00am

Recirculating-Flow Aqueous Electrolyte Resistor*

R. E. Beverly III¹, C. B. Beatty², W. A. Stygar²

¹R E Beverly III and Associates, United States of America; ²Lawrence Livermore National Laboratory, United States of America

11:00am - 11:20am

Multi-pulse Capability in Helical Flux Compression Generators with Novel Inductive Seeding and Load Power Delivery

T. M. Watson, K. Allen, A. Neuber, J. Mankowski

Pulsed Power and Power Electronics Laboratory, United States of America

11:20am - 11:40am

Development of a Custom Spiral Generator Winding Machine

E. Glynn¹, J. Walker¹, L. Caskey¹, I. J. Cohen¹, Z. Roberts¹, M. Rader², C. Elliott²

¹Radiance Technologies, Huntsville, AL, USA; ²US Army Space and Missile Defense Command, Redstone Arsenal, AL, USA

11:40am - 12:00pm

Calculation of Radio Interference for Unconventional High Surge Impedance Loading (HSIL) Transmission Lines

M. Abedin Khan, M. Ghassemi

The University of Texas at Dallas, United States of America

Poster Session 2

Time: Thursday, 30/May/2024: 1:30pm - 3:00pm · Location: White River A-E

P2-01 Comparative Analysis of Gas Insulation within a Simulated Helical Flux Compression Generator Geometry using Air, SF₆, and NovectTM 4710†

N. Fryar, K. Schriener, J. Stephens, J. Dickens, A. Young, A. Neuber
Texas Tech University, United States of America

P2-02 Compound-composite insulator Materials for pulsed high-voltage vacuum Interfaces

A. M. Steiner¹, M. L. Burnette¹, E. M. Redline¹, A. S. Peretti¹, R. S. Goeke¹, J. K. Smith¹, J. Felix¹, R. Joseph¹, K. M. Allen^{1,2}, J. J. Leckbee¹, G. C. Frye¹

¹Sandia National Laboratories, United States of America; ²Texas Tech University

P2-03 Conductivity and Vacuum Flashover Measurements on Composite Materials using a Pulsed-Power Test Stand

R. Joseph, M. Burnette, A. Steiner, J. Felix, J. Smith, J. Leckbee, E. Redline, A. Peretti
Sandia National Laboratories, United States of America

P2-04 Characterization of the Dielectric Behavior of an Anodized Aluminum Plasma Chamber in a Plasma-Electrode Pockels Cell

N. A. Carrier, G. Wagner, T. Walker, B. Kruschwitz, G. Brent, K. Gibney, S. Agnello
Laboratory for Laser Energetics, University of Rochester, 250 East River Road, Rochester, NY 14623-1299

P2-05 Improving Environmental Responsibility of a SF₆ Insulated 750KV System

A. Weismantel, E. Loftin, H. Gaus
Los Alamos National Laboratory, United States of America

P2-06 A Mesa Structure Combined with Nanoparticle-Filled Innovative Encapsulation Material for Electric Field Reduction within (U)WBG Power Module Packages

P. Adhikari, M. Ghassemi
The University of Texas at Dallas, United States of America

P2-07 A New Nanodielectric Fluid Using a Multi-Nanoparticle System for Power Transformers

S. P. Kalakonda, M. Ghassemi
The University of Texas at Dallas, United States of America

P2-08 Liquid Nanodielectrics for Heat Transfer in 3D Heterogeneous Microsystems: A review

S. P. Kalakonda, M. Ghassemi, R. Henderson
The University of Texas at Dallas, United States of America

P2-09 Pulsed Dielectric Breakdown of Dielectrically Altered Solid Insulators

S. Scoggin, H. Atchison, N. Jennings, D. Wetz
UT Arlington, United States of America

P2-10 Investigation on the Enhancement of Effects at Small Pulse Application Number on Sterilization of Packaged Cut Vegetables Using Pulsed Plasma under Usual and Low Oxygen Concentrations

P. Cui, J. Koshimawari, K. Saito, Y. Minamitani
Yamagata University, Japan

P2-11 Molecular Dynamics Simulations to Assess the Transition Between Field Emission and Space-Charge-Limited Current with Collisions

A. M. Komrska, L. I. Breen, A. L. Garner
Purdue University, West Lafayette, IN 47907 USA

P2-12 Limiting Current in a Two-Dimensional Crossed-Field Gap with Bipolar Flow

J. K. Wright, X. Zhu, A. L. Garner
Purdue University, United States of America

P2-13 E-Field Measurements of HERMES III Electromagnetic Pulse (EMP) Environment

M. D. Johnston, T. C. Grabowski
Sandia National Laboratories, United States of America

P2-14 Impact of Mission Profile and Pulse-Width Modulated High Dv/dt Voltage on Aerospace Wiring

P. Fu¹, N. Adina¹, R. Borjas¹, J. Wang¹, D. Schweickart², D. Grosjean³, T. Bixel⁴

P2-15 An Apparatus for measuring Laser assisted Field Emission in a Vacuum Diode

A. Slovak¹, **L. Jin**², **Y. Heri**², **J. Mankowski**¹, **J. Dickens**¹, **A. Neuber**¹, **P. Zhang**², **J. Stephens**¹

¹Center for Pulsed Power and Power Electronics, Texas Tech University, United States of America; ²Department of Electrical and Computer Engineering, Michigan State University, East Lansing, Michigan, United States of America

P2-16 Analysis of Partial Discharge Characteristics of MVDC Power Cables Optimally Designed for All-Electric Wide Body Aircraft under Varying Pressure During Takeoff and Decent

A. Saha¹, **S. P. Kalakonda**¹, **M. A. Rahman**¹, **S. Chowdhury**¹, **M. Ghassemi**¹, **J. Lehr**²

¹The University of Texas at Dallas, United States of America; ²University of New Mexico, Department of Electrical and Computer Engineering, Albuquerque, UM, USA

P2-17 The Upgrade of the SNS Extraction Kicker Power Supplies for the Proton Power Upgrade

Y. Tan, **V. Peplov**

Oak Ridge National Laboratory, United States of America

P2-18 Frequency tunable Ku-band Relativistic Backward Wave Oscillator solution

J.-C. Diot, **A. Catrain**, **B. Roudeix**, **T. Chanconie**, **L. Dos Santos**, **Q. Lestrade**, **L. Sousbiel**

CEA, France

P2-19 Development and Test of Pulse-Forming Network Marx Generator for High-Power Microwave Applications

T. Ko, **B. Baird**, **M. Mounho**, **J. Dickens**, **A. Neuber**, **J. Mankowski**, **J. Stephens**

Center for Pulsed Power and Power Electronics, Texas Tech University, United States of America

P2-20 Testing a 50 kV Inductive Adder for High-Energy Beam Kickers

J. Prager, **K. Miller**, **D. Zarshenas**, **S. Geeson**, **C. Bowman**

Eagle Harbor Technologies, Inc., United States of America

P2-21 Experimental Study of the Upper Frequency Limits of a PCB-based Ferromagnetic Nonlinear Transmission Line

T. R. Wright¹, **D. Saheb**¹, **J. Hoebelheinrich**¹, **J. Mankowski**¹, **J. Dickens**¹, **A. Neuber**¹, **J. Schrock**², **J. Stephens**¹, **E. Schrock**³

¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX; ²Air Force Research Laboratory, Kirtland AFB, NM; ³Sandia National Lab, Albuquerque, NM

P2-22 Influence of the Saturation Magnetization on Operation of a Bench Compact Gyromagnetic Line

J. O. Rossi¹, **L. P. Silva Neto**², **J. J. Barroso**³, **F. S. Yamasaki**³, **E. Schamiloglu**⁴

¹FUNCATE, Brazil; ²UNIFESP; ³INPE; ⁴UNM

P2-23 An experimental setup for X-band high-power microwave generation with no guiding magnetic field

B. Baird, **M. Mounho**, **T. Ko**, **J. Dickens**, **A. Neuber**, **J. Mankowski**, **J. Stephens**

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

P2-24 Experimental characterization of distributed ferromagnetic nonlinear transmission lines in different geometries

W. W. Hendricks, **J. Mankowski**, **J. Dickens**, **J. Stephens**, **A. Neuber**

Texas Tech Center For Pulsed Power and Power Electronics, United States of America

P2-25 Design of a Film and Foil Tesla Transformer for a megavolt Modulator

J. C. Pouncey, **A. Halter**, **J. Maybury**

Navy Surface Warfare Center Dahlgren Division, United States of America

P2-26 Initial Testing of Compact Rep-Rate Pulsed Power System

E. N. Guerin, **A. N. Brusstar**, **R. A. Revolinsky**, **C. J. Swenson**, **N. M. Jordan**

University of Michigan, United States of America

P2-27 Analysis of Novel Materials for Nonlinear Transmission Line Applications

T. L. Price, **T. D. Crawford**, **A. L. Garner**

Purdue University, United States of America

P2-28 Investigation of Machining Response of Inert PBX 9501 and PBX 9502 Surrogate Materials

K. L. Kelp¹, **S. Watkins**¹, **R. Clark**¹, **L. Boswell**¹, **A. E. Spurbeck**¹, **J. Dickens**¹, **J. Mankowski**¹, **J. Brinkman**², **A. Neuber**¹

¹Texas Tech Center for Pulsed Power and Power Electronics, United States of America; ²CNS Pantex, FM2373 and HWY 60

P2-29 Multi-Pulse Test Line (MPTL)

A. M Brandes, M. Schulze, A. Press, J. Campos
Los Alamos National Lab, United States of America

Solid State Pulse Generators

Time: Thursday, 30/May/2024: 3:30pm - 5:30pm · Location: White River F

Session Chair: Rob Saethre, Oak Ridge National Laboratory

Maximum number of presentations for this session: 6

3:30pm - 3:50pm

A Comparison of various Solid-State Pulse Generators for small-scale Nonlinear Transmission Line Applications

D. Saheb¹, T. Wright¹, J. Hoebelheinrich¹, J. Mankowski¹, J. Dickens¹, A. Neuber¹, J. Schrock², J. Stephens¹

¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, Texas, USA; ²Air Force Research Laboratory, Kirtland AFB, NM, USA

3:50pm - 4:10pm

ODIN Klystron Modulator

C. Yeckel

Stangenes Industries, United States of America

4:10pm - 4:30pm

Design and Operation of a High Rep-Rate, Solid-State Switched, Bipolar Spiral Generator

I. J. Cohen¹, J. Walker¹, D. Harthan¹, L. Caskey¹, W. Hooper¹, Z. Roberts¹, A. Vellozzi², M. Henry², A. Henson², K. E. Miller², J. Zuraw², J. Prager², M. Rader³, C. Elliott³

¹Radiance Technologies, Huntsville, AL, USA; ²Eagle Harbor Technologies, Seattle, WA, USA; ³US Army Space and Missile Defense Command, Redstone Arsenal, AL, USA

4:30pm - 4:50pm

Optimization of Repetitive Opening Switch Generators and Comparisons to SPICE modeling

D. O. Smith, J. Lehr

University of New Mexico, United States of America

4:50pm - 5:10pm

New Generation Energy Extraction Systems for HL-LHC Project at CERN

B. I. Panev¹, M. Pojer¹, F. R. Mateos¹, G.-J. Coelingh¹, M. A. Grigorov¹, S. Georgakakis¹, P. Borkowski², M. Rodak², A. Sienicki², F. Wojcik²

¹CERN, Switzerland; ²DEA-TUL, Lodz, Poland

5:10pm - 5:30pm

Sub micro-seconds solid-state pulsed power modulator operating plasma reactor for gas treatment

J.-B. Ahn, H.-J. Ryoo

Chung-Ang University, Korea, Republic of (South Korea)

Plasma Discharges

Time: Thursday, 30/May/2024: 3:30pm - 5:30pm · *Location:* White River G-J

Session Chair: Zach C. Shaw, Nevada National Security Sites

Maximum number of presentations for this session: 6

3:30pm - 3:50pm

Extending Collisional Space-Charge-Limited Current to Nonplanar Diodes

A. L. Garner, N. R. S. Harsha, A. M. Loveless

Purdue University, United States of America

3:50pm - 4:10pm

Multidimensional Space-Charge-Limited Current from a Rough Cathode

N. R. Sree Harsha, A. Garner

Purdue University, United States of America

4:10pm - 4:30pm

Similarity Law of Radio-frequency Argon Microplasmas

D. Wen, C. VanScoter, P. Zhang, J. Verboncoeur

Michigan State University, United States of America

4:30pm - 4:50pm

Determining The Electric Field In A 10-Ns Pulsed Plasma In A Methane-Air Mixture Using E-Fish

M. Z. Rahman, C. J. Kliewer, C. Jiang

Old Dominion University, United States of America

4:50pm - 5:10pm

Development and Testing of Portable Shielding Enclosure to Protect Against Lightning Induced EMI

**C. Lynch¹, A. Hewitt¹, A. Solis¹, C. Sims¹, J. Mankowski¹, J. Dickens¹, A. Neuber¹, J. Stephens¹, C. Noltensmeyer², E. Alva²,
C. Nelson², D. Friesen², D. Hattz²**

¹Center for Pulsed Power and Power Electronics, Texas Tech University, Lubbock, TX, USA; ²Consolidated Nuclear Security, Pantex, Amarillo, TX, USA

5:10pm - 5:30pm

Influences of temperature on partial discharge characteristics of biaxially oriented polypropylene films under nanosecond pulse voltage

Y. Mi, Y. Chen, C. Liu, W. Liu, Y. Peng

Chongqing University, China

Switches

Time: Friday, 31/May/2024: 10:00am - 12:00pm · *Location:* White River F

Session Chair: David Wetz, UT Arlington

Maximum number of presentations for this session: 6

10:00am - 10:20am

Enhancing Drift Step Recovery Diode Performance through Graded Epitaxy: Simulation and Analysis

A. Usenko¹, J. Eifler¹, A. Caruso¹, S. Bellinger², G. Bhattarai¹

¹University of Missouri-Kansas City, United States of America; ²Semiconductor Power Technologies, Inc.

10:20am - 10:40am

Pulsed Glow Discharge Generation by Combination of SOS-diode and PFN

T. Sugai¹, Y. He¹, T. Ishiyama¹, K. Nagao², W. Jiang¹

¹Nagaoka University of Technology, Japan; ²National Institute of Technology, Oyama College, Japan

10:40am - 11:00am

Blumlein-Generator with a GaN-HEMT in gate-boosted operation as closing Switch

M. Sack, D. Herzog, G. Müller

Karlsruhe Institute of Technology, Germany

11:00am - 11:20am

Experimental and Theoretical Assessments of Electron Emission in Solid-State Diodes

C. J. Buerke, S. Hossain, R. L. McCafferty, A. G. Sinelli, N. R. S. Harsha, A. M. Loveless, A. L. Garner

Purdue University, United States of America

11:20am - 11:40am

High Current Tokamak Protection Switch

M. Kempkes, K. Quinlan, D. Cope, A. Blanchette, M. Gaudreau, R. Simpson

Diversified Technologies, Inc., United States of America

11:40am - 12:00pm

Low Voltage High Current Circuit Breaker

M. Kempkes, B. Phillips, M. Gaudreau, S. Eustis, S. Hunter, D. Cope, R. Simpson

Diversified Technologies, Inc., United States of America

Analytical Methods

Time: Friday, 31/May/2024: 10:00am - 12:00pm · *Location:* White River G-J

Session Chair: Adam Michael Darr, Sandia National Laboratories

Maximum number of presentations for this session: 6

10:00am - 10:20am

Modeling Pulse Waveforms Necessary for Neuronal Stimulation

S. J. Wyss¹, R. P. Joshi², A. L. Garner¹

¹Purdue University, United States of America; ²Texas Tech University, United States of America

10:20am - 10:40am

Multidimensional Space-Charge-Limited Current as a Function of Cathode Thickness

P. D. Spengler, N. R. Sree Harsha, A. L. Garner

Purdue University, United States of America

10:40am - 11:00am

Quasi-Equilibria for Dynamic Analysis of Crossed-Field Theory

A. M. Darr, K. Cartwright

Sandia National Laboratories, United States of America

11:00am - 11:20am

Simulation of Nanocrystalline Magnetic Cores using Maxwell ANSYS.

D. Wright¹, K. Kelp¹, J. Dickens¹, J. Mankowski¹, J. Stephens¹, Z. Shaw², A. Neuber¹

¹Texas Tech University Center for Pulsed Power and Power Electronics; ²Mission Support and Test Systems

11:20am - 11:40am

Development of a Numerical Model of Vector Inversion Generators and Comparison with Experimental Data

T. Gloeckler¹, A. Hewitt¹, S. Love¹, J. Mankowski¹, J. Dickens¹, A. Neuber¹, J. Stephens¹, A. Vellozzi², M. M. Henry², K. Miller², I. Cohen³, J. Walker³, L. Caskey³, A. King³

¹Texas Tech, United States of America; ²Eagle Harbor Technologies, Seattle, WA, USA; ³Radiance Technologies, Huntsville, AL, USA

11:40am - 12:00pm

Efficient Modeling of Inductively Coupled Pulsed Power Circuits Using FastHenry and LTSPICE

B. Rablah, W. Kozicki

General Fusion Inc., Canada