

# **2009 Annual Report Conference on Electrical Insulation and Dielectric Phenomena**

**(CEIDP 2009)**

**Virginia Beach, Virginia, USA  
18 – 21 October 2009**



**IEEE Catalog Number: CFP09CID-PRT  
ISBN: 978-1-4244-4557-8**

# TABLE OF CONTENTS

<b>Development of Highly Thermoconductive Epoxy Composites</b> .....	1
<i>Y. Miyazaki, T. Nishiyama, H. Takahashi, J. Katagiri, Y. Takezawa</i>	
<b>Calculation of Partial Discharge Inception Voltages in Ultradilute SF<sub>6</sub> + N<sub>2</sub> Gas Mixtures</b> .....	5
<i>H. Duzkaya, M. S. Dincer, H. R. Hizirogula</i>	
<b>Technical Advancements in the Integration of Online Partial Discharge Monitoring in Distribution Cable Networks</b> .....	9
<i>P. Wagenaars, P. A. A. F. Wouters, P. C. J. M. van der Wielen, E. F. Steennis</i>	
<b>Reducing Air Clearance Requirements for Voltage Uprating of Overhead Line by Use of Line Surge Arresters</b> .....	13
<i>S. Venkatesan, A. Haddad, H. Griffiths, N. Harid, M. Albano</i>	
<b>On the Conductivity of Pure Epoxy in Time and Frequency Domain</b> .....	19
<i>S. Azer, T. Mertens, D. Peier, S. Rehkopf</i>	
<b>ICAAS - Integrated System for Lasting Accelerated Aging of MV Cables, Data Monitoring and Acquisition</b> .....	23
<i>I. Mladenovic, C. Weindl</i>	
<b>Preliminary Study on Detection of PD Under Oscillatory Impulse Voltage</b> .....	27
<i>X. Zhao, X. Yao, Z. Sun, Y. Li</i>	
<b>Tracking Behaviour in the Presence of Conductive Interfacial Defects</b> .....	31
<i>J. Andersson, R. S. Guerrero, S. M. Gubanski, H. Hillborg</i>	
<b>Evaluation of Dielectric Properties in Polypropylene/clay Nanocomposites</b> .....	35
<i>N. Fuse, T. Tanaka, Y. Ohki</i>	
<b>Role of the Interface on Charge Build-up in a Low-density Polyethylene: Surface Roughness and Nature of the Electrode</b> .....	39
<i>M. Taleb, G. Teyssède, S. Le Roy</i>	
<b>Partial Discharge Diagnosis for Transformer – One Step toward Strong Smart Grid in China</b> .....	43
<i>Z. Zheng, L. Ruan, C. Li, S. Gao, J. Ruan, J. Gui</i>	
<b>Partial Discharges of Thermally and Electrically Aged Insulation</b> .....	47
<i>J. Pihera, P. Martinek, J. Klasna, B. Paslavský, R. Polanský, V. Mentlík, P. Trnka</i>	
<b>Dielectric Integrity of Silica-PAI Nanocomposites at Elevated Temperature</b> .....	51
<i>A. M. Travelpiece, J. K. Nelson, L. S. Schadler, D. Schweickart</i>	
<b>High Thermal Conductive Laminates for Large Current</b> .....	55
<i>M. Tsuji, T. Kawahira, Y. Takase, K. Fukushima, Y. Takezawa</i>	
<b>Effect of Crystallinity on the Partial Discharge Resistance of Poly-L-Lactide</b> .....	59
<i>Y. Ohki, K. Miyata</i>	
<b>Complex Permittivity Spectra of Several Insulating Polymers at Electrical and THz Frequencies</b> .....	63
<i>Y. Ohki, N. Fuse, S. Hikosaka, Y. Takemura, M. Mizuno, K. Fukunaga</i>	
<b>Tree Initiation and Growth in LDPE/MgO Nanocomposites and Roles of Nano Fillers</b> .....	67
<i>T. Tanaka, T. Iizuka, Y. Sekiguchi, Y. Murata, Y. Ohki</i>	
<b>Ester Fluids as Alternative for Mineral Oil: The Difference in Streamer Velocity and LI Breakdown Voltage</b> .....	71
<i>R. Liu, C. Törnkvist, V. Chandramouli, O. Girlanda, L. A. A. Pettersson</i>	
<b>Withstand Voltage Testing in Combination with PD Measurements of XLPE Cables Under Damped Alternating Voltage On-site</b> .....	77
<i>Z. Sun, X. Zhao, J. Li, Y. Li</i>	
<b>Capacitance Behavior of Electric Double Layer Capacitor Using Nanocomposite Electrode</b> .....	81
<i>D. Tashima, Y. Betsumiya, M. Taniguchi, H. Yoshitama, M. Otsubo, S. Maeno</i>	
<b>Investigation on Transformer Oil Impedance During Breakdown Under AC Voltage</b> .....	85
<i>S. Abdi, A. Boubakeur, N. Harid, A. Haddad</i>	
<b>Evaluation of Influence of Mineral Oil Immersion on Dielectrical Properties of Silicone Polymers by Thermal Analysis</b> .....	89
<i>A. Haas, J. Kindersberger</i>	
<b>Some Peculiarities of Breakdown Voltage Computation in Non-uniform Electric Field by Impulse Impact</b> .....	93
<i>A. Samusenko, Y. Stishkov</i>	
<b>Some Unexplained Disturbing Phenomena in the Electrical Properties of Dielectric Polymers</b> .....	97
<i>J. Crine</i>	

<b>High Field Effects on the Electrical Aging of Polyethylene and of Polypropylene</b> .....	101
<i>J. Crine</i>	
<b>Electrical Accelerated Aging of EPR Cable Insulation Energized by AC Voltage and Switching Impulses</b> .....	105
<i>S. Grzybowski, L. Cao, B. Pushpanathan</i>	
<b>Surface Charge Relaxation in Silicone Rubber and EPDM</b> .....	109
<i>S. Kumara, Y. V. Serdyuk, S. M. Gubanski</i>	
<b>Effect of Field-dependent Mobility on Current Density and Dynamics of Space Charge in Polyethylene</b> .....	113
<i>J. Zhao, Z. Xu, G. Chen, P. Lewin</i>	
<b>Possibility of Non-destructive Detection of Electrochemical Migration in Epoxy Resin by the Pulsed Electroacoustic Method</b> .....	117
<i>M. Natsui, H. Asakawa, T. Tanaka, Y. Ohki, T. Maeno, K. Okamoto</i>	
<b>Hot Spot Temperature Models Based on Top-oil Temperature for Oil Immersed Transformers</b> .....	121
<i>J. Li, T. Jiang, S. Grzybowski</i>	
<b>Clean Fog Evaluation of RTV Silicone Rubber Coatings with Different Thicknesses and Pollution Levels</b> .....	125
<i>A. M. Abd-Elhady, M. A. Issularab</i>	
<b>Interfacial Charge Behavior in Nanodielectrics</b> .....	129
<i>R. C. Smith, L. Hui, J. K. Nelson, L. S. Schadler</i>	
<b>Dissipation Current Waveforms Monitoring in LDPE Sheet Under Water Tree Deterioration Test</b> .....	133
<i>T. Osada, K. Tohyama, T. Imai, K. Abe</i>	
<b>Adaptive Matched Filter Bank for Noise Reduction in Online Partial Discharge Monitoring</b> .....	137
<i>P. Wagenaars, P. A. A. F. Wouters, P. C. J. M. van der Wielen, E. F. Steennis</i>	
<b>Electrohydrodynamic Enhancement Condensation of Dielectric Liquid on the Horizontal Enhanced Tube</b> .....	141
<i>C. Chen, G. Lan, G. Zhang, X. Zhang</i>	
<b>Reducing Ice Accumulation on Aluminum Conductor by Applying Superhydrophobic Coating</b> .....	144
<i>F. Wang, C. Li, Y. Lv, Y. Du</i>	
<b>Experimental Evaluation for Plasma Diagnoses of Gas-Jet Type Atmospheric Pressure Plasma</b> .....	148
<i>R. Fukawatase, R. Ohyama</i>	
<b>Experimental Investigation on Photochemical NO<sub>x</sub> Gas Treatment for Diesel Engine Combustion Exhaust by a Dielectric Barrier Discharge Type Xe Excimer Lamp</b> .....	152
<i>N. Shimura, R. Ohyama</i>	
<b>An Image Analysis of Positive Ionic Wind Velocity Under the DC Corona Discharge in Needle-cylinder Electrode System</b> .....	156
<i>H. Nakamura, R. Ohyama</i>	
<b>Study on Heat Transfer Effect of in Electrohydrodynamic Model Pipe</b> .....	160
<i>C. Chen, L. Wang, E. Qi, X. Zhang</i>	
<b>Deterioration Mechanism of Paper Base Phenolic Insulators for Power Distribution Equipment</b> .....	164
<i>S. Miki, S. Umemura, H. Okazawa, Y. Otsuka, H. Matsuki</i>	
<b>Challenges to Machine Windings Used in Electrical Generators in Wave and Tidal Power Plants</b> .....	168
<i>T. Judendorfer, J. Fletcher, N. Hassanain, M. Mueller, M. Muhr</i>	
<b>Electrical Breakdown of CF<sub>3</sub>I and CF<sub>3</sub>I-N<sub>2</sub> Gas Mixtures</b> .....	172
<i>M. N. Ngoc, A. Denat, N. Bonifaci, O. Lesaint, W. Daoud, M. Hassanzadeh</i>	
<b>Electrochemical Treeing in XLPE/silica Nanocomposites</b> .....	176
<i>L. Hui, R. Smith, J. K. Nelson, L. S. Schadler</i>	
<b>Electric Characteristics of MgO/LDPE Nanocomposite up to Breakdown under DC Ramp Voltage</b> .....	180
<i>T. Okazaki, S. Okuzumi, S. Imazawa, Y. Murakami, M. Nagao, Y. Sekiguchi, C. C. Reddy, Y. Murata</i>	
<b>Analysis on Partial Discharge Propagation and Detection in MV Power Transformers</b> .....	184
<i>M. Tozzi, H. Saad, G. C. Montanari, A. Cavallini</i>	
<b>Influence of a Metallic Particle at a Metal/insulator/gas Triple Junction in Air and SF<sub>6</sub></b> .....	188
<i>L. Caliap, O. Lesaint, A. Denat, N. Bonifaci, G. Blanchet, A. Girodet, B. Gelloz</i>	
<b>Measurement and Analysis of Partial Discharge Current During Square Voltage Waveforms</b> .....	192
<i>B. Sonerud, T. Bengtsson, J. Blennow, S. M. Gubanski</i>	
<b>Behaviour of Low Current Discharges Between Water Drops</b> .....	196
<i>X. Zhang, S. M. Rowland</i>	
<b>Partial Discharge Detection at Delamination of Electrode/Epoxy Interface in GIS Spacers</b> .....	200
<i>D. A. Mansour, H. Kojima, N. Hayakawa, F. Endo, H. Okubo</i>	
<b>Dielectric Characteristics of Epoxy/Alumina Nanocomposite with Particle Dispersion Techniques Using Ultrasonic Wave and Centrifugal Force</b> .....	204
<i>M. Kurimoto, H. Watanabe, K. Kato, N. Hayakawa, M. Hanai, Y. Hoshina, M. Takei, H. Okubo</i>	

<b>Electrocoalescence of Drops in a Water-in-Oil Emulsion</b> .....	208
<i>J. Holto, G. Berg, L. E. Lundgaard</i>	
<b>The Voltage Stresses of Insulation Systems Under PWM Inverter Supplies</b> .....	212
<i>B. Florkowska, M. Florkowski, J. Furgal, J. Roehrich, P. Zydron</i>	
<b>Effect of Cross-linking Agent on Space Charge Accumulation in XLPE Under DC Electric Stress</b> .....	216
<i>B. Vissouvanadin, S. Le Roy, G. Teyssèdre, C. Laurent, I. Denizet, M. Mammeri, B. Poisson</i>	
<b>Reduction of Fast dU/dt Impact for Protection of Distribution Transformers</b> .....	220
<i>M. Florkowski, M. Fulczyk, P. Klys, M. Ostrogórska, W. Piasecki</i>	
<b>The Dependency of Water Droplet Behaviour and Leakage Current Pattern on Electrode Configuration</b> .....	224
<i>E. Da Silva, S. M. Rowland</i>	
<b>Assessing Dielectric Integrity of Oil/paper Insulated Cable-GIS Terminals Using On-site Techniques</b> .....	228
<i>C. G. Azcarraga, E. Robles</i>	
<b>Charge Transport and Behavior Analysis with Electron Irradiated (PMMA)</b> .....	232
<i>S. Fakhfakh, O. Jbara, Z. Fakhfakh</i>	
<b>Improvement in High-temperature Dielectric Properties of Epoxy Resin by Abundant Addition of Micro-silica</b> .....	237
<i>M. Hyuga, N. Tagami, T. Tanaka, Y. Ohki, T. Imai, M. Harada, M. Ochi</i>	
<b>Input of Optimization Techniques for Implementing Charge Transport Models in Electrical Insulation</b> .....	241
<i>F. Baudoin, S. Leroy, G. Teyssèdre, C. Laurent</i>	
<b>Pulsed Arc Electrohydraulic Discharge Characteristics and Plasma Parameters of Sludge-water</b> .....	245
<i>O. L. Li, J. S. Chang, Y. Guo</i>	
<b>Analysis of Cumulative Number and Polarity of Creeping Discharges Initiated at Solid/Liquid Interfaces Subjected to AC Voltage</b> .....	249
<i>A. Beroual, L. Kebbab</i>	
<b>Surface Conductivity Measurements on Large Polymer Samples</b> .....	253
<i>M. J. Given, R. A. Fouracre, I. V. Timoshkin, S. J. Macgregor, J. M. Lehr</i>	
<b>Modeling Laboratory Negative Long Spark Discharges</b> .....	257
<i>A. Beroual, J. H. Rakotonandrasana, I. Fofana</i>	
<b>Embedded Sphere Method for Measuring Dielectric Breakdown in Polymers and Polymer Composites</b> .....	261
<i>S. Balasubramanian, P. Muzykov, H. Loye, T. Sudarshan, H. J. Ploehn</i>	
<b>Charge Regulation Mechanism of Grounded-coated Insulators</b> .....	265
<i>Z. Fakhfakh, S. Fakhfakh, O. Jbara</i>	
<b>Modeling of Partial Discharges in the Presence of Harmonics</b> .....	270
<i>S. Bahadoorsingh, S. M. Rowland</i>	
<b>Integral Equation Method for the Computation of PD Inception Voltage in Voids</b> .....	274
<i>Y. Huang, K. Burbank, J. Z. Zhang</i>	
<b>Sterilization of Liquid by High Electric Field Pulse</b> .....	278
<i>Y. Oka, Y. Muramoto, N. Shimizu, S. Ichihara</i>	
<b>Influence of Electric Field on Plant Weight</b> .....	282
<i>T. Okumura, Y. Muramoto, N. Shimizu</i>	
<b>Three-dimensional Tree Simulation of Composite System Considering an Interface Perpendicular or Parallel to the Electric Force Line</b> .....	286
<i>H. Uehara, T. Fujimoto, N. Nanba, K. Kudo</i>	
<b>Propagation Characteristics of Water Trees Using Full and Half-cycle Rectified Voltage Waveforms</b> .....	290
<i>T. Fujimoto, H. Uehara, N. Nanba</i>	
<b>Transient and Steady-state Currents in Disordered Polyethylene Film Under Charge Packet Effects</b> .....	294
<i>E. Belagaroui, A. Kallel</i>	
<b>Thermal Conductivity of Nano-filled Epoxy Systems</b> .....	299
<i>R. Kochetov, T. Andritsch, U. Lafont, P. H. F. Morshuis, J. J. Smit</i>	
<b>Computational Quantum Mechanics-based Study of Conduction in Iodine Doped Polyethylene</b> .....	303
<i>A. Huzayyin, S. Boggs, R. Ramprasad</i>	
<b>Dielectric Barrier Discharges in Multi-layer Polymer Ferroelectrets</b> .....	307
<i>R. A. C. Altafim, R. A. P. Altafim, H. C. Basso, X. Qiu, W. Wirges, R. Gerhard, W. Jenninger, J. Wagner</i>	
<b>Partial Discharge Measurements for Spherical Cavities Within Solid Dielectric Materials Under Different Stress and Cavity Conditions</b> .....	311
<i>H. A. Illias, G. Chen, P. L. Lewin</i>	
<b>Dielectric Barrier Discharge Using Nitric Acid Modified Silicone Rubber</b> .....	315
<i>D. Zhou, C. Li, H. Zhan, S. Duan, J. Xu</i>	

<b>Experimental Study on the Relationship Between Partial Discharge and Gas Decomposition Products in SF6 Insulated Electrical Equipments.....</b>	<b>318</b>
<i>B. Qi, C. Li, Z. Wu, Y. Zhang, S. Zheng</i>	
<b>Fault Identification and Classification of High Voltage Underground Cables by Wavelet Transform.....</b>	<b>322</b>
<i>D. Prabhavathi, K. Prakasam, B. R. Reddy, M. S. Kalavathi, C. P. Babu</i>	
<b>Capacitive Sensor for the Measurement of Transients in Gas-insulated Switchgears.....</b>	<b>327</b>
<i>H. Wu, C. Li, H. Xu, G. Ma, J. Quan, J. Jiang</i>	
<b>Relationship Between Breakdown and Space Charge Formation in Polyimide Film Under DC High Stress.....</b>	<b>332</b>
<i>Y. Kishi, H. Miyake, Y. Tanaka, T. Takada</i>	
<b>Space Charge Accumulation and Breakdown in LDPE and LPDE/OgO Nano-composite Under High DC Stress at Various Temperatures.....</b>	<b>336</b>
<i>J. Yoshida, T. Maezawa, H. Miyake, Y. Tanaka, T. Takada</i>	
<b>Space Charge in Polypropylene Containing Synthetic NanoParticles.....</b>	<b>340</b>
<i>S. S. Bamji, A. Bulinski, M. Abou-Dakka, D. McIntyre</i>	
<b>Dielectric Properties of Polypropylene Loaded with Synthetic Organoclay.....</b>	<b>344</b>
<i>A. Bulinski, S. S. Bamji, M. Abou-Dakka, Y. Chen</i>	
<b>An Integral Equation for Analyzing Phase-resolved Partial Discharge Characteristics Under Sinusoidal Voltage Waveform Conditions.....</b>	<b>350</b>
<i>T. Okamoto, T. Takahashi, S. Miyazaki, T. Kuraishi</i>	
<b>Experimental Study on the Evolution of Surface Discharge for Oil-paper Insulation in Transformers.....</b>	<b>354</b>
<i>H. Wang, C. Li, K. Sheng, Y. Miao</i>	
<b>Dielectric Properties of ETFE Wiring Insulation as a Function of Thermal Exposure.....</b>	<b>358</b>
<i>L. Li, N. Bowler, S. H. Yoon, M. R. Kessler</i>	
<b>Electrical Performance Evaluations for a Dielectric Barrier Discharge Plasma Actuator.....</b>	<b>362</b>
<i>A. R. H. Rigit, L. K. Chun, D. B. B. Liang</i>	
<b>Analysis of the Sensitivity of an Impedimetric Biosensor for the Detection of Bacteria.....</b>	<b>367</b>
<i>M. S. Webster, I. V. Timoshkin, S. J. MacGregor, R. A. Fourace, M. Matthey</i>	
<b>Numerical Simulation of Thermo-stimulated Depolarization Currents in Polyethylene Films.....</b>	<b>371</b>
<i>S. Le Roy, F. Baudoin, L. Boudou, C. Laurent, G. Teyssèdre</i>	
<b>Dielectric Properties and Resistance to Corona and Ozone of Epoxy Compositions Filled with Micro- and Nano-fillers.....</b>	<b>375</b>
<i>B. Ma, S. M. Gubanski, A. Krivda, L. E. Schmidt, R. Hollertz</i>	
<b>Fault Detection, Classification and Location on Transmission Lines Using Wavelet Transform.....</b>	<b>381</b>
<i>B. R. Reddy, M. V. Kumar, M. Suryakalavathi, C. P. Babu</i>	
<b>Impedance Spectroscopy Studies of Electroporated Human Breast Cancer Cells.....</b>	<b>384</b>
<i>F. Xiao, K. Otto, I. Camarillo, R. Sundararajan</i>	
<b>Reducing Ice Coating on Insulators by Combining RTV with Different Volume Resistivity.....</b>	<b>388</b>
<i>Y. Qin, Z. Wang, Z. Xu, X. Wei, Z. Jia, L. Wang</i>	
<b>On Tracking and Erosion Resistance of High Temperature Vulcanizing Silicone Rubber.....</b>	<b>392</b>
<i>L. E. Schmidt, X. Kornmann, H. Hillborg, A. Krivda</i>	
<b>Influence of Semicon Shields on the Dielectric Loss of XLPE Cables.....</b>	<b>395</b>
<i>T. Liu, J. Fothergill, S. Dodd, U. Nilsson</i>	
<b>Influence of a Grading Ring on AC Flashover Voltage of an EHV Post Insulator Covered with Ice.....</b>	<b>399</b>
<i>C. Volat, F. Farzaneh, H. Akkal</i>	
<b>Calculation of Critical Flashover Voltage of Ice-covered Insulators Using the Finite Element Method.....</b>	<b>403</b>
<i>C. Volat, M. Farzaneh, N. Mhaguen</i>	
<b>The Optimization of Multi-parameter Insulation Diagnosis.....</b>	<b>407</b>
<i>K. Wu, W. Shen, Y. Meng, W. Cao, C. Pan, Y. Cheng, X. Zhang</i>	
<b>A Novel Sensor for UWB RF PD Location and Experimental Investigation on a 220kV Transformer.....</b>	<b>411</b>
<i>W. Chang, Z. Tang, C. Li, H. Wang, Y. Yang, Y. Jiang</i>	
<b>Simulation of Trichel Streamer Pulse Characteristics at Various Air Pressures and Humidity.....</b>	<b>415</b>
<i>X. Bian, J. Hui, Y. Chen, L. Wang, Z. Guan, M. MacAlpine</i>	
<b>Rheological, Thermal and Electrical Properties of Poly(ethylene Oxide) / Boehmite Nanocomposites.....</b>	<b>419</b>
<i>M. Reading, A. S. Vaughan</i>	
<b>Characteristics of a Positive DC Arc Formed Over an Ice Surface.....</b>	<b>423</b>
<i>S. Farokhi, M. Farzaneh, I. Fofana, A. J. Carreira</i>	
<b>Time-resolved Spectroscopic Observation of Surface Flashover Across an Ice Surface.....</b>	<b>427</b>
<i>A. Nekahi, M. Farzaneh, B. Mirizaei, S. Kumar</i>	
<b>Using Ultraviolet Imaging Method to Detect the External Insulation Faults of Electric Device.....</b>	<b>431</b>
<i>C. Zang, H. Ye, H. Lei, X. Yin, J. He, J. Zhenglong, S. He, X. Zhao</i>	

<b>Investigation on Change Laws of Arc Burning Time of the Arc Plasma</b> .....	436
<i>C. Zang, J. He, W. Huang, W. Zhou, L. Wang, C. Liu</i>	
<b>Synthesis and Dielectric Properties of Epoxy based Nanocomposites</b> .....	440
<i>T. Andritsch, R. Kochetov, Y. T. Gebrekiros, U. Lafont, P. H. F. Morshuis, J. J. Smit</i>	
<b>Ultra-fast Space Charge Packets in Nanostructured Epoxy-based Materials</b> .....	444
<i>D. Fabiani, G. C. Montanari, E. Siracusano, L. A. Dissado</i>	
<b>Surface Degradation on XLPE under PD Activity</b> .....	448
<i>J. M. Martinez-Tarifa, A. Cavallini, G. C. Montanari, L. A. Dissado</i>	
<b>Influence of Voltage Waveforms and Frequencies On Dielectric Barrier Discharges in Low Air Pressure</b> .....	452
<i>S. Duan, H. Zhan, C. Li, D. Zhou, J. Xu</i>	
<b>Deriving an Equivalent Circuit of Composite Oil Paper Insulation for Understanding the Frequency Domain Spectroscopic Measurements</b> .....	456
<i>F. Meghnefi, I. Fofana, H. Hemmatjou, M. Farzaneh</i>	
<b>Reduction of Dissipation Factor in Power Cable Material Systems Containing Metallocene- and Post-metallocene-catalyzed Polymers</b> .....	460
<i>T. J. Person, R. F. Eaton</i>	
<b>Study on Dielectric Breakdown at DC Polarity Reversal in Oil / Pressboard-composite Insulation System</b> .....	464
<i>T. Nara, K. Kato, F. Endo, H. Okubo</i>	
<b>Dielectric and Thermal Properties of Polyamide-imide (PAI) Films</b> .....	468
<i>S. Diahm, M. L. Locatelli, T. Lebey, S. Dinculescu</i>	
<b>DC Conduction Current, Dielectric Strength and Electroluminescence of Standard, Nanofilled and Microfilled Polyetherimide Varnishes</b> .....	472
<i>D. Mary, D. Malec, M. Q. Nguyen, P. Werynski, B. Gornicka, L. Therese, P. Guillot</i>	
<b>Space Charge Distribution Detection by FLIMM and PEA Method on Electron Beam Irradiated Dielectric Films</b> .....	476
<i>C. Pham, V. Griseri, L. Berquez</i>	
<b>Very Low Frequency Breakdown Strengths of Electrical Insulation Materials at Cryogenic Temperatures</b> .....	480
<i>I. Sauers, E. Tuncer, G. Polizos, D. R. James, A. Ellis, M. Pace</i>	
<b>Low Temperature Partial Discharge Properties of Silicone Gels Used To Encapsulate Power Semiconductors</b> .....	484
<i>T. A. T. Vu, J.-L. Augé, O. Lesaint</i>	
<b>Single Frequency Characterization of a Commercial Resin</b> .....	488
<i>E. Tuncer, I. Sauers, D. R. James, A. Ellis, G. Polizos, M. Pace</i>	
<b>Breakdown in Liquid Nitrogen in the Presence of Thermally Generated Bubbles for Different Electrode Geometries</b> .....	491
<i>I. Sauers, R. James, A. Ellis, E. Tuncer, G. Polizos, M. Pace</i>	
<b>Electrical Properties of a Polymeric Nanocomposite with In-Situ Synthesized Nanoparticles</b> .....	495
<i>E. Tuncer, G. Polizos, I. Sauers, D. R. James, A. Ellis, K. L. More</i>	
<b>Electrical and Thermal Properties of Polyvinyl Acetal Based Nanocomposites</b> .....	499
<i>G. Polizos, E. Tuncer, I. Sauers, D. R. James, A. Ellis</i>	
<b>One-dimensional Analysis of a Wire-Rod Type Electrohydrodynamic Gas Pump</b> .....	502
<i>N. Takeuchi, K. Yasuoka, J. S. Chang</i>	
<b>Numerical Estimation of Trap Depth in Polymeric Materials Using Molecular Orbital Method</b> .....	506
<i>Y. Hayase, T. Osada, T. Takada, Y. Tanaka</i>	
<b>Impact of Surface Characteristics on the Micro Process of Ice Formation</b> .....	510
<i>Z. Xu, Z. Wang, C. Yang, Z. Jia, Z. Guan</i>	
<b>Comparisons of Fibers Properties Between Vertical and Horizontal Type Electrospinning Systems</b> .....	514
<i>C. Yang, Z. Jia, Z. Xu, K. Wang, Z. Guan, L. Wang</i>	
<b>Analysis of Thermal Stresses in Medium Voltage Motor Coils Under Repetitive Fast Pulses</b> .....	518
<i>E. Sharifi, S. Jayaram, E. A. Cherney</i>	
<b>Influence of Sugar in Contaminant to Outdoor Insulation Characteristics of Glass Insulator</b> .....	522
<i>H. Mei, Y. Mao, L. Wang, J. Zheng, Z. Guan</i>	
<b>Study on Process of DC Pollution Flashover of Porcelain Insulators of Parallel Double-Strings Form at High Altitude</b> .....	526
<i>G. Peng, F. Zhao, Z. Guan, L. Wang</i>	
<b>Surface Potential Decay of Gamma-irradiated Low-density Polyethylene</b> .....	530
<i>G. Chen</i>	

<b>Effect of Lorentz Force on the Conducting Contaminant Trajectory in a Three Phase Gas Insulated Busduct</b> .....	534
<i>D. Padmavathi, J. Amarnath, S. Kamakshaiah</i>	
<b>Temperature Dependence of Inception of Electrical Tree from Water-tree Degradation</b> .....	538
<i>Y. Hayashi, Y. Suzuok, T. Kato, F. Komori, H. Mashima</i>	
<b>Condition Evaluation of Oil-paper Insulation Based on Dielectric Spectroscopy</b> .....	542
<i>S. Yang, M. Dong, G. Zhang, Z. Zhang</i>	
<b>Observation of Partial Discharge Current Waveform Under Inverter Surge Application</b> .....	546
<i>T. Takino, K. Nanao, Y. Murakami, N. Hozumi, M. Nagao</i>	
<b>Effect of Contaminant pH and Natural Fog on Naturally Polluted Porcelain Disc Insulator in Northern Region of India</b> .....	550
<i>A. A. Khan, E. Husain, A. Masood</i>	
<b>Space Charge Formation in Low-density Polyethylene Up to Breakdown Influenced by Addition of MgO Nano-filler Under DC Ramp Voltage</b> .....	555
<i>Y. Murakami, T. Okazaki, M. Nagao, Y. Sekiguchi, C. C. Reddy, Y. Murata</i>	
<b>Two Dimensional Studies of Trichel Pulses in Air Using the Finite Element Method</b> .....	559
<i>T. N. Tran, I. O. Golosnoy, P. L. Lewin, G. E. Georghiou</i>	
<b>DC Pre-stress Effect on Positive Streamer Initiation and Propagation in Insulating Liquid Subjected to Step Voltages</b> .....	563
<i>M. T. Do, A. Nysveen, L. E. Lundgaard, S. Ingebrigtsen</i>	
<b>Reaction-diffusion and Two-fluxes Method Computation of Secondary Electron Emission Yield</b> .....	567
<i>A. Aoufi, G. Damamme</i>	
<b>Streamer Inception and Propagation Models for Designing Air Insulated Power Devices</b> .....	571
<i>A. Pedersen, T. Christen, A. Blaszczyk, H. Boehme</i>	
<b>Impulse Breakdown Voltages of Ester-based Transformer Oils Determined by Using Different Test Methods</b> .....	575
<i>Q. Liu, Z. Wang, F. Perrot</i>	
<b>Dielectric Characterization of High Density Polyethylene/SiO<sub>2</sub> Nanocomposites</b> .....	580
<i>A. Sami, E. David, M. Fréchet</i>	
<b>Partial Discharge Measurements During the Degradation of Nanocomposite Twisted Pair Specimens</b> .....	584
<i>F. Guastavino, S. Squarcia, E. Torello</i>	
<b>Electrical Aging Test on Twisted Pair Specimens Under Different Environmental Conditions</b> .....	588
<i>F. Gustavino, A. Dardano, A. Ratto, E. Torello</i>	
<b>Electrical Treeing in LDPE Nanocomposite Materials</b> .....	592
<i>F. Guastavino, A. Dardano, S. Squarcia, P. Tiemblo, J. Guzman, E. Benito, N. Garcia</i>	
<b>Charge Injection Energy Barriers and Charge Mobilities in Insulating Liquids</b> .....	596
<i>I. V. Timoshkin, M. J. Given, R. A. Fouracre, S. J. MacGregor</i>	
<b>Electrical Tracking in Cycloaliphatic Epoxy Based Nanostructured Composites</b> .....	600
<i>F. Gustavino, A. S. Thelakkadan, G. Coletti, A. Ratto</i>	
<b>Post-heat Treatment Effect on the Dielectric Response of Epoxy Samples</b> .....	604
<i>M. Fréchet, E. David, H. D. Martinez, S. Savoie</i>	
<b>Effect of Nanostructuring on Molecular Response</b> .....	608
<i>M. Fréchet, C. W. Reed</i>	
<b>Electrical and Thermal Ageing of Microcomposite Nano-filled Epoxy: Influence on Space Charge Accumulation</b> .....	614
<i>J. Castellon, H. N. Nguyen, S. Agnel, A. Toureille, M. Fréchet</i>	
<b>Polarity Reversal in Streaming Electrification Measurements</b> .....	618
<i>D. Zmarzly, P. Aksamit</i>	
<b>Dielectric Properties of Fullerene-doped Insulation Liquids</b> .....	622
<i>P. Aksamit, D. Zmarzly</i>	
<b>AC Voltage Endurance of Polyimide Insulated Magnet Wire</b> .....	626
<i>E. Ildstad, S. R. Chalise</i>	
<b>Aging Evaluation of Silicone Rubber Nanocomposites</b> .....	630
<i>I. Ramirez, S. Jayaram, E. A. Cherney</i>	
<b>Influence of Repetitive Application of Damped AC Voltage on Insulation Performance of Water Tree Aged XLPE Cable</b> .....	634
<i>Toshihiro Takahashi, Tsuguhiro Takahashi, T. Okamoto</i>	
<b>Deterioration Analysis of Ex-Serviced 110 kV XLPE Cable Based on Residual Charge Method</b> .....	638
<i>B. X. Du, H. Li, Y. Gao, L. Wang, Z. Huo</i>	
<b>Application of Dielectric Barrier Discharge in the Removal of NO<sub>x</sub> from Diesel Exhaust</b> .....	642
<i>B. X. Du, H. J. Liu, X. H. Wang, K. Wang</i>	

<b>Partial Discharge Endurance Test on Several Kinds of Nano-filled Enameled Wires Under High-frequency AC Voltage Simulating Inverter Surge Voltage</b> .....	646
<i>M. Hikita, K. Yamaguchi, M. Fujimoto, M. Kozako, S. Ohtsuka, M. Ohya, K. Tomizawa, N. Fushimi</i>	
<b>Surface Charging and Charge Decay on Gamma-ray Irradiated Epoxy Resin Laminate</b> .....	650
<i>Y. Gao, B. X. Du, X. H. Zhu</i>	
<b>Characterization of the Conduction Mechanisms in Polycrystalline Alumina</b> .....	654
<i>K. Zarbout, A. S. Ahmed, G. Moya, G. Damamme, J. Bernardini, A. Kallel</i>	
<b>A Combined CWT-DWT Method Using Model-based Design Simulator for Partial Discharges Online Detection</b> .....	658
<i>R. Candela, E. Romano, P. Romano</i>	
<b>Novel Investigation for Specimens Aging Tests Under Partial Discharges and Temperature</b> .....	662
<i>C. K. Vibhakar, S. A. Kanitkar</i>	
<b>Water Trees in Medium Voltage XLPE Cables: Comparison of Different Polyethylene Insulation Using Short Time Accelerated Ageing Tests</b> .....	666
<i>G. Platbrood, B. Hennuy, Y. Tits, S. J. Sutton</i>	
<b>Restoring Reliability of Aged Bushings</b> .....	671
<i>V. R. Garcia-Colon</i>	
<b>Electrically-Enhanced Proliferation Control in Adult Human Mesenchymal Stem Cells</b> .....	674
<i>R. Kumar, S. Muralitharen, S. M. Usman, R. P. Ramachandran, R. Sundararajan, S. Madhivanan, K. M. Cherian, S. Begam, S. Guhathakurta, K. Sankaranarayanan</i>	
<b>Leakage Current Analysis for Predicting Flashover in Distribution Network</b> .....	678
<i>T. P. Hong, D. N. Trong, D. V. Hoang</i>	
<b>Statistical Modeling for Predicting Degradation of Medium Voltage Outdoor Equipment</b> .....	682
<i>G. Iyer, R. S. Gorur, A. Krivda, P. Mahonen</i>	
<b>Very Low Frequency (VLF) Breakdown of Air in Nonuniform Fields for Varying Humidity Conditions</b> .....	686
<i>D. Rodríguez, R. S. Gorur, P. M. Hansen</i>	
<b>Grounding Resistance Calculation Using FEM and Reduced Scale Model</b> .....	690
<i>T. P. Hong, Q. D. Van, T. V. Viet</i>	
<b>A Study on the Influence of Ozone on Aging of HTV Silicone Rubber</b> .....	694
<i>Y. Tu, W. Wang, M. Li, L. Ding</i>	
<b>Sparkover in Sphere Gaps with Alternating Voltages and Perturbed Electric Fields</b> .....	698
<i>N. K. Kishore, G. S. Puneekar, H. S. Y. Shastry</i>	
<b>The Relationship Between Surface Partial Discharge and Carbon Trace in Oil-impregnated Paper Insulation</b> .....	702
<i>Y. Cheng, C. Li, Y. Miao</i>	
<b>Study on Stator Winding Degradation Under Bar Vibration</b> .....	706
<i>X. Peng, Z. Jia, S. Gao, L. Wang, Z. Guan</i>	
<b>Calculation and Analysis of the Current Carrying Capability of Electric Cable Based on Finite Element Method</b> .....	710
<i>Y. Wang, R. Chen, S. Lin, J. Tian, J. Li, M. Chen</i>	
<b>Measurements of the Thermal, Dielectric, Piezoelectric, Pyroelectric and Elastic Properties of Porous PZT Samples</b> .....	714
<i>S. B. Lang, E. Ringgaard</i>	
<b>Effect of Electrode Materials on the Formation of the Interfacial Charge between Two Dielectrics: Low Density Polyethylene (LDPE) and Fluorinated Ethylene Propylene (FEP)</b> .....	718
<i>F. Rogti</i>	
<b>34.5 KV Electrical Cables Outages Exploration and Categorization</b> .....	722
<i>M. H. Shwehdi</i>	
<b>Laser Based Sensor for Determination of Outages Causes of Electrical Cables</b> .....	726
<i>M. H. Shwehdi, M. A. Gondal, A. A. I. Khalil</i>	
<b>Broadband Dielectric Spectroscopy in Nano-(Bio)-Physics</b> .....	730
<i>F. Kremer, A. Serghei, J. R. Sangoro, M. Trefß, E. U. Mapesa</i>	
<b>Author Index</b>	